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Institutional and Corporate Aspects of Sustainable Development of the Agrifood Sector in Russia

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Abstract: This article examines the institutional and corporate aspects of sustainable development of the agrifood sector in Russia. It analyzes the evolution of the concept of sustainable development on the global and national agendas, as well as the strategic documents and indicators of Russia in the field of sustainable development. The study also reviews modern scientific approaches to sustainable development of agrifood systems and agricultural enterprises. The authors propose an interpretation of "sustainable development of an enterprise in the agrifood sector" based on a balanced integration of economic, environmental, social and informational factors. Key levels of the sustainable development concept – fundamental, sectoral and corporate – are systematized, and the systemic aspects of corporate sustainability (integration into strategic management, stakeholder orientation, innovation, and long-term effectiveness) are identified. The scientific novelty of the study lies in a comprehensive analysis of the interconnections between institutional conditions and corporate strategies to ensure sustainable development of the agricultural sector. The practical significance consists in formulating recommendations for integrating ESG principles and the circular economy into the activities of agricultural enterprises and improving state policy in the interests of sustainable development.

1 INTRODUCTION

Contemporary challenges in the global economy and environmental conditions necessitate a comprehensive approach to the sustainable development of Russia's agrifood sector, in which institutional frameworks and corporate strategies play a pivotal role. The implementation of ESG principles, and the advancement of the legislative base and governmental regulatory mechanisms, have become critically important for agricultural enterprises to effectively adapt to evolving market demands and international commitments. At the same time, corporate sustainability – rooted in the integration of economic, social and environmental objectives into corporate governance – has become an indispensable element for ensuring food security and competitive advantage in the long term. Examining the interplay between institutional mechanisms and corporate practices in the agricultural sector is therefore justified by the need to develop recommendations for improving state policy and enhancing the efficiency of agribusinesses amid the global transformation of economic and environmental paradigms.

The global concept of sustainable development has evolved over recent decades, as reflected in key international initiatives and agreements. Since the first recognition of the problem at the United Nations Conference on the Human Environment in Stockholm (1972) and the introduction of the definition of sustainable development in the Brundtland Commission's report (1987), the world community has progressively specified the goals and mechanisms for achieving them. In 1992, at the Earth Summit in Rio de Janeiro, major agreements were adopted (the UN Framework Convention on Climate Change, the Rio Declaration on Environment and Development,

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and Agenda 21 – international climate and sustainable development accords). In 2000, the UN Millennium Declaration established the Millennium Development Goals (MDGs) – the first global targets for sustainable development. The Rio+20 Conference (2012) introduced the concept of a "green economy" as a mechanism for sustainable development. At present, the basis of the global sustainable development paradigm is the 2030 Agenda for Sustainable Development, adopted by UN member states in 2015. The 2030 Agenda includes 17 SDGs, detailed through 169 targets and a system of measurable indicators, enabling progress monitoring at global, national and regional levels. The Russian Federation has officially aligned its national development goals with 14 of the 17 UN SDGs, covering social, environmental and economic directions. According to the 2024 Sustainable Development Report, Russia ranks 56th out of 166 countries with an integrated SDG index score of 73.1 (out of 100). This index reflects roughly 73% achievement of the combined goals and indicates an average level of progress (Figure 1).

Figure 1: Average performance by SDG in Russian Federation, 2024.

In Russia, certain target indicators have been fully achieved or are maintained at a high level – in particular, extreme poverty has been eliminated (SDG 1), high-quality education has been ensured (SDG 4), and a sustainable and safe urban environment has been formed (SDG 11). At the same time, significant challenges persist: goals related to climate action (SDG 13), preservation of terrestrial ecosystems and biodiversity (SDG 15), and life below water (SDG 14) remain difficult to achieve.

Russian state policy on sustainable development in recent years has focused on climate adaptation of agriculture, ecological and social transformation of the economy, and responsible investing.

The Russian Federation adapts international standards and agreements to its national specifics, emphasizing energy efficiency, environmental safety and rational nature use. Unlike the EU countries, Russia currently remains significantly oriented toward the use of traditional energy resources, although steps are being taken toward a gradual transition to a low-carbon economy. Experts note that sustainable development on a global scale remains a multi-component category requiring consideration of national economic models and technological development levels (Bik, 2021). Accordingly, in Russia, the sustainable development strategy must be adapted to the realities of a resource-dependent economy: transformation of the energy sector and the introduction of "green" technologies should be accompanied by careful economic policies that minimize social risks.

The development of the sustainable development paradigm has led to the formation of specialized concepts of sustainable development for agrifood systems (sector level) and corporate sustainability (sustainable development of agricultural enterprises). The global agrifood system is involved in achieving most of the UN SDGs, especially SDG 2 ("Zero Hunger, food security and improved nutrition, sustainable agriculture"), SDG 8 ("Sustained, inclusive economic growth, full and productive employment"), SDG 12 ("Responsible consumption and production"), and SDG 13 ("Climate action"). On a global scale, the agrifood system represents a closed cycle covering all stages – from production of raw materials, agricultural, forestry and fish products, their processing, transportation and storage, to distribution, consumption and disposal of food waste. The international strategy for developing the agrifood system is based on the concept of sustainable, "green," climate-oriented agriculture. Under this concept, a food system is considered sustainable if it can provide the global population with high-quality nutrition while significantly reducing the negative impact of agricultural activities on the environment.

For the 2021 UN Food Systems Summit, a concept of the global agrifood system was prepared, identifying five areas (the so-called "tracks") linking food systems with other economic sectors – the climate and environmental sectors, health systems, governance (institutions) and science and innovation sectors. Russia, participating in the dialogue at the UN Food Systems Summit, emphasized the need for international cooperation on all these tracks, including joint measures for environmental protection, development of sustainable agriculture, maintaining open food trade, and exchange of research, knowledge and technologies (Kruglyak, 2024).

The concept of sustainable development for the agrifood sector in the Russian Federation is supported at the level of strategic documents. Among these is the Russian Federation's Doctrine of Food Security (2020 edition), which explicitly states that the most important prerequisite for ensuring the country's food security under any external or internal conditions is the sustainable development of agricultural production, raw materials and foodstuffs based on scientifically grounded planning. In implementing this Doctrine and the State Programme for Agricultural Development, the following strategic objectives have been identified: achieving food self-sufficiency, technical and technological modernisation of the sector, rural development and environmental sustainability. These objectives are pursued through a suite of federal projects (such as "Development of Agrifood Industries and Technical Modernisation of the Agrifood Complex", "Export of Agrifood Products", "Stimulating Investment Activity in the Agrifood Sector", "Development of Rural Tourism", etc.), all aimed at supporting agriculture and related industries, enhancing their efficiency and competitiveness. The state policy in the field of sustainable development of the agricultural sector, focused on increasing agricultural productivity, adapting to global challenges (including climate change and external economic constraints), makes a significant contribution to achieving SDG 2 (Figure 2).

At the same time, the scientific discourse dedicated to sustainable development is distinguished by a wide variety of approaches and terminological heterogeneity. An analysis of the use of the term "sustainable development" in scholarly literature and regulatory documents shows that its substantive interpretations differ significantly. This necessitates clarification of the conceptual framework and standardisation of definitions in order to ensure comparability of research. Establishing a unified categorical basis not only deepens the theoretical understanding of the issue but also increases the relevance and practical value of analytical information for managing socio-economic processes within the paradigm of sustainable development.

This study is based on one of the most comprehensive definitions of sustainable development presented in the intergovernmental document "Legislative Foundations of the Concept of Sustainable Development for CIS Member States" (Interparliamentary Assembly of the CIS, 2021). According to this document, sustainable development is understood as balanced development that ensures the resolution of socio-economic tasks and environmental protection without compromising the needs of future generations. The Concept identifies four groups of key control parameters: environmental (the condition of natural landscapes and ecosystems), demographic (dynamics of population size and quality), economic (efficiency of production-consumption and financial systems) and social (protection of human rights, reduction of poverty and crime, guarantee of societal and state security). This broad interdisciplinary approach reflects the multifaceted nature of sustainable development and provides a basis for specifying the concept in relation to the agricultural sector.

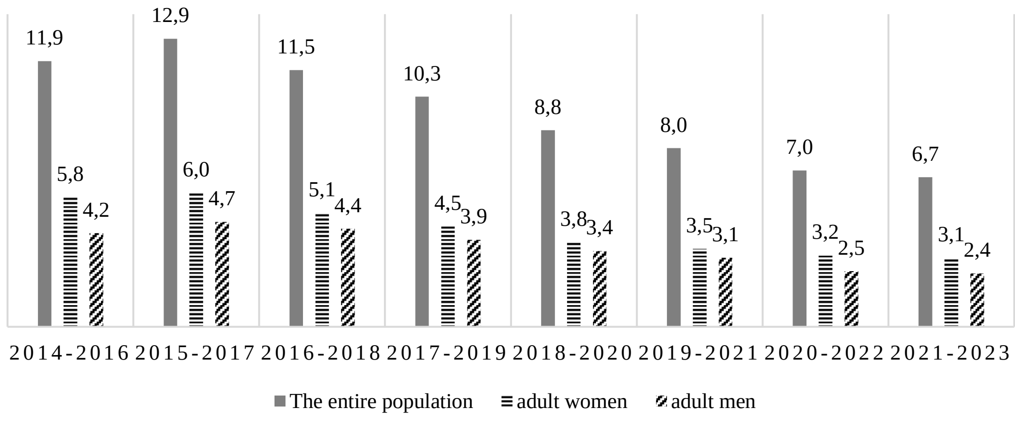

Figure 2: The population of the Russian Federation experiencing moderate or acute food shortages, million people.

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2 MATERIALS AND METHODS

The materials of this study include international and national programmatic and strategic documents on sustainable development (UN and FAO reports, Agenda 2030, the Russian Doctrine of Food Security, etc.), statistical data on sustainable development indicators (including Russia's SDG Index, FAOSTAT data on food security), as well as a wide range of scientific publications by Russian and foreign authors on sustainable development of agriculture and corporate sustainability. The research analyzed scholarly works covering the evolution of the sustainability concept in the agrifood sector and studies defining sustainable development of agricultural enterprises.

The research methods are based on a systemic approach and include: historical-chronological analysis (to trace the evolution of sustainable development concepts in global and national contexts); comparative analysis (to compare international and Russian sustainability targets and different scientific approaches); content analysis and literature analysis (to systematize definitions and identify key aspects of corporate sustainability based on scholarly publications); and scientific abstraction and synthesis (to formulate the authors' definition and develop the classification of sustainability levels). The application of a dialectical method allowed consideration of contradictory tendencies (eco-centric vs. techno-centric approaches) in current discussions. Systematization of theoretical and empirical materials underlies the proposed three-level model of sustainable development of the agrifood sector. The reliability and validity of the results were ensured by using data from international organizations and official statistics, as well as relying on peer-reviewed scientific sources.

3 RESULTS AND DISCUSSION

The concept of sustainable development for the agrifood sector has undergone a long evolution in the scientific literature – from a narrow understanding of sustainability as the stability of agricultural production to a modern comprehensive interpretation including economic, environmental and social components. One of the earliest methodological approaches can be traced to Russian scholars of the late 19th to mid-20th century, such as A. F. Fortunatov (1888), V. M. Obukhov (1923), B. S. Yastremsky (1937) and N. S. Chetverikov (1975). These researchers viewed the sustainability of agricultural production primarily through the lens of stability in yields and output volumes. An agro-system was considered sustainable if year-to-year yield fluctuations were minimal, ensuring predictability of production.

In the 1980s, I. P. Boiko (1986) proposed a more general concept of sustainability as a property of any production process that is independent of the absolute levels of indicators or the rate of their change. Opposing views were presented by I. B. Zagaytov and P. D. Polovinkin (1984), and A. G. Prudnikov (1988), who argued that the sustainability of agricultural production is inseparable from the dynamics of society's needs. This implied the necessity for the system to be adaptable to changing economic, social and climatic conditions.

At the turn of the 20th–21st centuries, researchers paid more attention to the multi-factor nature of sustainability. I. V. Kurtsev (2001) linked sustainable development to a reproduction process involving expanded reproduction of all main resources of agriculture. A. A. Nikolaev (2003) emphasized the system's ability to resist negative external influences, i. e. its resilience. Modern studies continue to develop a systems approach: for example, N. K. Vasilyeva (2007) treats sustainable development of the agrifood sector as a dynamically evolving process leading to economically justified, environmentally safe and socially oriented reproduction. O. B. Glinkina (2010) and I. Yu. Chazova (2017) characterize the resilience of agricultural production through the system's ability to maintain its functioning under external shocks and to return to equilibrium after adverse changes. V. A. Ivanov and A. S. Ponomareva (2011), E. I. Gromov (2023) emphasize the triune interconnection of economic, social and environmental components of sustainable development – a concept that has become common in evaluating the sustainability of the agro-sphere.

Some authors provide applied refinements: for example, D. V. Khodos and S. G. Ivanov (2013) define sustainable development of the agrifood sector as the ability of all spheres of the agricultural economy to dynamically maintain effective proportions of development across the entire sector, ensure expanded reproduction and form national food security. A. V. Kharitonov (2016) and I. B. Mukambaeva (2018) stress the continuity and sufficiency of food supply to the population under conditions of effective farming activity and without harm to the environment. O. V. Shumakova and O. N. Kryukova (2017) view sustainable development of the agrifood sector as a government-regulated market process that ensures the stability of the agricultural economy through a balance of food supply and demand. I. G. Ushachev, A. G. Paptsov and A. F. Serkov (2018) give a multi-factor definition of agricultural sustainability as steady growth and continuous techno-economic renewal of the sector, improvement of human potential and social conditions in rural areas. All this together ensures the growth of production of products and raw materials in volumes sufficient to achieve the target indicators of food security and national self-sufficiency, as well as to expand exports of competitive agri-products. Finally, A. P. Potapov (2022) defines sustainability of agricultural production as the maintenance of stable output volumes over a long period, allowing the population's needs in basic food products to be met regardless of adverse natural and economic conditions.

Summarizing the scientific approaches presented, two key perspectives (paradigms) on the essence of sustainable development of the agrifood sector can be distinguished:

- Static approach. In this paradigm, sustainability is understood primarily as the stability and balance of the system. Economic sustainability is analyzed from the standpoint of maintaining achieved financial and economic performance and minimizing the amplitude of its fluctuations under crisis influences. A model of agricultural production is assumed that can maintain ecological equilibrium and provide favourable working conditions for farmers, thereby contributing to their economic well-being. The main goal of sustainable functioning in this approach is to hold current socio-economic indicators at their level or prevent their decline. The static (conservative) approach was characteristic of many foreign studies (approaches to sustainable agriculture in the 1980s–90s) and some Russian works focused on maintaining the stability of agriculture under existing conditions;
- Dynamic approach. This approach considers sustainability as the system's ability to adapt to changing internal and external conditions. The emphasis is not on preserving the status quo but on ensuring progressive development – constant improvement of socio-economic indicators while simultaneously reducing negative environmental impact. Within this paradigm, sustainable development implies the harmonious interaction of three components: economic growth, social well-being and environmental stability. This triad is explicitly highlighted in the works of A. V. Nikitin, E. A. Klimentova, A. A. Dubovitsky, M. S. Petukhova and S. V. Koval, emphasizing the need for simultaneous progress in all directions (economy, society, environment). In our opinion, a dynamic adaptive approach is most rational for analyzing the essential characteristics of sustainable development of Russia's agrifood sector. The formation of a sustainable agricultural production model should focus not only on economic growth but also on ensuring environmental safety and rational use of natural resources – necessary for preserving the sector's productive potential for future generations.

Additionally, current scientific discussion on sustainable agriculture reflects a confrontation between eco-centric and techno-centric approaches to the practical implementation of sustainability:

- Eco-centric approach. This approach is based on the need to limit the pace of anthropogenic development. It emphasizes the transition to organic and biodynamic farming, restructuring of consumption patterns, fair redistribution of resources and their rational use. The main goal is to minimize the negative impact of agricultural activities on ecosystems. Such an approach presupposes a priority abandonment of extensive and industrial-intensive farming methods in favour of closer integration of agricultural production into natural ecological processes. The eco-centric paradigm emphasizes harmony with nature, even at the cost of limiting economic ambitions;
- Techno-centric approach. By contrast, this approach is based on the idea that achieving environmental sustainability is primarily possible through scientific-technical progress and effective institutional policy. Academician I. G. Ushachev, among the key directions of sustainable development for Russia's agrifood sector, highlights scientific-technical and innovation policy, development of rural social infrastructure, improvement of land relations and the activation of the agri-sector's foreign economic activities. Proponents of techno-centrism argue that modernization of the agro-industry and large-scale introduction of resource-saving and ecologized technologies (for example, precision farming, industrial-scale organic agriculture technologies) can neutralize environmental degradation threats

without halting production growth. This approach includes, in particular, the possibilities of genetic selection and biotechnology to develop crop varieties and animal breeds with increased productivity and resistance to stress factors, thereby reducing the use of chemical inputs. A significant role is given to the digitalization of agricultural management: use of automated monitoring and control systems to optimize resource (water, fertilizer, energy) use and minimize environmental risks. The techno-centric approach thus aims to resolve the conflict between economic and environmental goals through technological innovations and effective institutions.

Corporate sustainability has become a new methodological basis for the activities of agribusiness enterprises. Following Toffler's "Third Wave" theory (1980), as society transitions to a post-industrial stage, corporate sustainability moves to the forefront of strategic management. Corporations must adapt to changing socio-economic conditions and assume not only economic but also social and environmental functions. Daniel Bell (1973), describing the post-industrial society, noted the growing role of knowledge and information as key development resources – factors that, in modern conditions, become central to sustainability and determine the long-term competitiveness of companies. D. Bell and A. Toffler laid the foundation for recognizing that the future success of businesses depends on their ability to incorporate knowledge and address social-environmental concerns in their strategies.

The main sources of external pressure on corporations in a post-industrial economy ("third wave") can be grouped as follows:

- Third-wave transition and knowledge economy (Toffler, 1980; Bell, 1973): as society moves to a post-industrial "third wave," corporations face the need to adapt by embracing knowledge-intensive operations and broadening their roles beyond traditional profit motives. In this new paradigm, emphasis is placed on technology, information and innovative capacity as drivers of sustainable business;
- Environmental challenges: growing public scrutiny of business impacts on the environment forces companies to comply with strict environmental standards, shift to green economy principles and reduce the carbon footprint of their products. Elkington (1998), who introduced the Triple Bottom Line concept, emphasized the need to account not only for economic outcomes but also for ecological and social results of corporate activities. In other words, business success should be measured not only by profit, but also by contributions to public welfare and the state of the environment;
- Social transformations: influence of various stakeholder groups on business is strengthening in modern society. Corporate social responsibility (CSR) practices are expanding, and new forms of engagement are emerging between companies and local communities, NGOs, consumers, supply chain partners and other stakeholders. R. E. Freeman's stakeholder theory (1984; Phillips, Freeman, & Wicks, 2003) views a corporation as a socially embedded entity that must meet the expectations not only of shareholders, but also of a broad array of stakeholders – from employees and consumers to local residents and government. For long-term success, a company should build responsible relationships with all groups influencing its viability;
- Information transparency: in the age of open information, corporations face growing demands to disclose data on their activities, including non-financial sustainability metrics and social and ethical aspects of business. International reporting standards in the field of sustainable development have emerged (e. g. the Global Reporting Initiative, Integrated Reporting, etc.). D. Wheeler and B. Colbert (2003) emphasize that transparency and open dialogue with society become necessary for maintaining reputation and trust, without which long-term partnerships and sustainable business development are impossible;
- Changing value orientations: a new ethical paradigm is emerging in public consciousness, in which business is held accountable for the social and environmental consequences of its actions. Corporations are compelled to adhere to ethical norms and strive to reduce their negative impact on society and nature. T. Dyllick and K. Hockerts (2002) note that embedding principles of business ethics and sustainability into corporate governance is not just a fashion, but a response to deep changes in the value systems of consumers, investors and society as a whole.

Attempts have been made in the literature to systematize various approaches to defining the essence of corporate sustainability (Corporate Sustainability, CS). For example, M. M. Bergman, Z. Bergman and L. Berger (2017) identify three main conceptual types of corporate sustainability treatments based on a content analysis of publications:

- Type I: Relationship between corporate sustainability and corporate social responsibility (CS & CR). Three positions are noted within this type: (a) corporate sustainability is regarded as synonymous with corporate social responsibility (CS = CR); (b) as an independent phenomenon, distinct from CSR (CS ≠ CR); (c) as the result and function of CSR implementation (CR → CS);
- Type II: Monofocal corporate sustainability (CS1). This approach focuses either on an ethical-philanthropic aspect (interpreting CS as moral leadership of business) or on a strategic aspect (CS as a business strategy aimed at long-term value enhancement);
- Type III: Inclusive approaches (CSn). This includes the most comprehensive interpretations: corporate sustainability as an integrated management model (continuous improvement across all spheres of activity – CS∞); as an integral part of the Triple Bottom Line model (company sustainability assessed by combined financial, social and environmental indicators – CS_{TBL}); as a financial incentive tool (CS$ – inclusion of sustainability metrics in valuation and investment attractiveness assessments); and as an indicative system (CS/index – a system of metrics and indexes measuring company sustainability in the market).

Thus, in the global scientific community corporate sustainability is increasingly understood as a systemic approach to business management that includes accounting for the long-term social and environmental impacts of all economically significant actions of a company in the interests of a wide range of stakeholders. The structural elements of such a corporate governance system are:

- Integration of the Triple Bottom Line principle: simultaneous attention to economic, social and environmental outcomes of activities;
- Harmonization of short-term and long-term goals: balancing the interests of business, society and the environment in strategic planning;
- Adoption of ESG standards (Environmental, Social, Governance): focusing on environmental, social and governance factors as the basis for decision-making and risk assessment;
- Use of sustainability assessment tools: rating companies by sustainable development indices (e. g. the Dow Jones Sustainability Index, FTSE4Good), applying reporting standards (Global Reporting Initiative – GRI, international ISO 26000 standards, new sustainability standards under the S1, S2 directions, etc.), and incorporating sustainability criteria into investment appraisal models.

In recent years it has been noted that the sustainable development concept has ceased to be a merely national or regional initiative and has become a global vector of economic transformation (Demidenko & Malevskaya-Malevich, 2022). This is relevant not only for developed countries but also for Asia-Pacific states, where Russian companies are exploring new markets. In these conditions, substantiating the reliability and responsibility of Russian companies as business partners becomes critically important. Disclosing information on their non-financial indicators (environmental and social performance) can play a decisive role in forming long-term sustainable business relationships with foreign partners.

In Russian academia, the sustainable development of organizations is studied by many researchers – for example, V. I. Barilenko, A. D. Sheremeta, O. V. Yefimova, N. P. Lyubushina, N. E. Babicheva and others. The domestic academic tradition generally equates the concepts of “sustainable development of an enterprise” and “corporate sustainability,” considering them closely related in content. This is largely due to established methodological approaches, where the principles of the general sustainable development concept are directly transferred to individual companies without changing terminology. Meanwhile, in global practice the term corporate sustainability is usually used specifically to denote the sustainable development of business. This term has begun to appear in Russian research as well, in particular in the works of K. Yu. Belousov (2013) and some other authors analyzing the adaptation of the corporate sustainability concept to Russian realities.

From a methodological perspective, the core of corporate sustainability is the systemic alignment and balancing of corporate strategies aimed at simultaneously achieving economic, social and environmental goals. This principle is confirmed by the works of leading scholars in the field and is reflected in various definitions of sustainable development of an enterprise found in the literature (Table 1). Below are some such definitions, revealing the essence of corporate sustainability from different viewpoints.

Despite differences in wording, the above definitions of corporate sustainability demonstrate several common features:

- Triple balance: almost all authors emphasize the need to consider economic, social and environmental aspects of enterprise development simultaneously (the Triple Bottom Line concept is explicitly or implicitly present in all definitions);
- Long-term perspective: sustainable development of a company is associated with a long-time horizon, requiring consideration of distant consequences of management decisions and strategies (focus not on immediate gain, but on the future of the firm and society);
- Stakeholder orientation: many authors view sustainable development through the prism of the interests of various stakeholders: shareholders, investors, consumers, employees, local community, government, etc. A company must build responsible engagement with all groups that influence its success;
- Adaptability and risk management: it is noted that sustainable development requires the ability of the business to adapt to changes in the external environment, overcome crises, and reduce vulnerability to risks (economic, environmental, social).

Table 1: Definitions of "sustainable development of an enterprise".

Author (Year)	Definition
D. V. Khodos (2009)	"…the ability of an economic entity to increase social and economic efficiency; to continuously raise development rates by implementing expanded reproduction with the goal of providing the population with high-quality food products and ensuring the country's food security, without harm to the environment."
K. Yu. Belousov (2013)	"…a new management philosophy that implies rethinking the role of business in socio-economic development, a high level of companies' responsibility in economic, environmental and social spheres, as well as the formation of strategies adequate to the requirements of a socially-oriented innovative economy."
D. A. Endovitsky et al. (2017)	"The basis of corporate sustainability is the harmonization of a corporation's efforts to achieve its economic, social and environmental goals."
K. O. Rasteryaev (2019)	"Sustainable development management of a company in modern conditions contributes, through maximally effective combination of resources, to the creation and maintenance of a high level of added value distributed within social strata, ensuring a balance of all spheres of the external and internal environment."
V. A. Guzey (2022)	"…development of an economic entity that involves its natural and timely response to external environmental factors in combination with successful implementation of current and strategic directions of operation, taking into account the interests of all stakeholders."
S. A. Perederieva (2023)	"…the functioning of a system with given parameters to balanced provide the economic, social and environmental imperatives aimed at rational use of production factors, preservation of the biosphere, and inclusive growth."

At the same time, there are differences in emphasis among various researchers: Some scholars (e. g. V. A. Guzey, K. Yu. Belousov) interpret sustainable development primarily as a corporate philosophy and worldview concept intended to rethink the role of business in society and increase the level of corporate responsibility and ethics. Others (e. g. K. O. Rasteryaev) stress competitiveness and added value achieved through implementing sustainability principles (seeing sustainable development as an instrument for improving business efficiency). Some authors (e. g. D. V. Khodos) link sustainable development primarily with production-economic processes, including ensuring food security and environmental friendliness of the production base.

Based on synthesizing these approaches from foreign and domestic researchers, we formulate the following authors' definition: Sustainable development of an enterprise in the agrifood sector is a process of balanced economic growth and adaptation of business activities that ensures the enterprise's long-term economic efficiency, environmental safety and social responsibility. Sustainable development at the micro level implies rational use of resources, introduction of innovative technologies, increased investment resilience and formation of institutional mechanisms that reduce risks and strengthen the competitive advantages of the business in a changing external environment.

We believe that the systemic aspects of sustainable development of an agrifood enterprise should include the following components:

- Integration of sustainable development into strategic management: enterprises must take social and environmental factors into account when developing strategies and making decisions. The ESG concept (Environmental, Social, Governance) represents a long-term vector of corporate governance transformation. It stems from the need to overcome systemic imbalances of global development and implies reformatting business objectives to incorporate sustainability. Implementing ESG principles requires revising corporate values, including sustainability criteria in top management KPIs, planning investments in "green" projects, etc;
- Responsibility to stakeholders: a sustainable enterprise orients its activities to meet the expectations of key stakeholders: not only shareholders, but also consumers, employees, business partners, local communities and authorities. From a macroeconomic perspective, ESG can be viewed as a mechanism for redistributing economic benefits (similar to a quasi-tax) aimed at supporting socially and economically vulnerable groups and territories. A corporation operating on sustainability principles voluntarily invests part of its profits in social and environmental projects, thus taking on part of the government's responsibility to society;
- Innovation and long-term sustainability: implementation of technological, managerial and social innovations is a necessary condition for minimizing negative environmental impact and maintaining competitiveness. Innovations in agrotechnology (e. g. agro-digital platforms, biotechnology, precision farming), managerial innovations (new forms of labour organization, cooperation, partnerships) enable enterprises to adapt to climate change, demographic challenges and more. Ultimately, this increases their capacity for long-term survival and growth;
- Economic efficiency based on sustainable development: applying sustainability concepts should lead to increased competitiveness and added value of a company through the implementation of social and environmental responsibility principles. In the traditional model, business is evaluated by financial indicators (revenue, profit, return on capital, etc.). Under an ESG approach, enterprise performance assessment goes beyond financials – the impact on public goods is considered: air and water quality, soil fertility preservation, biodiversity, ecosystem services. Profit earned by depleting natural resources or exploiting labour is viewed as contrary to the principles of responsible business and undermining the company's long-term economic sustainability (Dyllick & Hockerts, 2002). Thus, sustainable development ceases to be perceived as a limitation for business – on the contrary, it becomes a source of additional competitive advantages (enhanced reputation, consumer loyalty, access to "green" financing and markets).

Modern concepts of sustainable development applied in agrifood systems and corporate governance continue to evolve, enriched by new ideas. One relevant approach is the Bio-Circular-Green (BCG) model, representing an integrated view of economic transformation based on integrating bioeconomy, circular (closed-loop) economy and the "green" economy. The Bio-Circular-Green model implies building a sustainable economic system capable of adapting to climate challenges and resource constraints. Its main principles are: extensive use of bio-resources and biotechnologies in production (transition from petrochemicals to biomaterials, development of biofuels, etc.); a closed cycle of materials and waste (maximum processing, reuse, minimization of landfill waste); and the stimulation of clean technologies by economic means (state programs, tax incentives, carbon trading).

The relationship between ESG and BCG approaches is determined by their common ultimate goal – ensuring sustainable development. However, ESG-factor analysis is primarily aimed at assessing business sustainability from the perspective of investors and risks, whereas the BCG model sets the strategy of economic transition to resource-saving technologies and circular value chains. In other words, ESG provides criteria and indicators by which a company's "sustainability" is evaluated on the market, while BCG represents the vision of a future economy to which states and corporations aspire. The two approaches complement each other: using ESG metrics encourages enterprises to move in the direction dictated by BCG (toward a "green" circular economy).

Thus, within the overall paradigm of sustainable development, concrete concepts have emerged and continue to evolve: sustainable development of agrifood systems (sector level) and corporate sustainability of enterprises. To integrate these concepts into a unified system, we have developed a scheme reflecting three interconnected levels – fundamental (paradigm), sectoral, and corporate. Each level has its functions, scale and examples of implementation, but they are all united by the common idea of balanced development. Table 2 presents a systematization of scientific views on sustainable development of the agrifood sector with these levels highlighted.

Table 2: Three-level model of sustainable development concepts for the agrifood sector.

Criterion	Paradigm of Sustainable Development (fundamental level)	Concept of Sustainable Development of APC (sectoral level)	Corporate Sustainability – Sustainable Development of an Agrifood Enterprise (corporate level)
Level of generalization	Fundamental, meta-scientific (global paradigm)	Sectoral, concretized (APC strategies and models)	Corporate, operational (enterprise/cooperative/supply-chain level)
Function	Defines basic principles and global sustainability guidelines (UN SDGs, national goals)	Develops mechanisms and technological approaches to ensure sectoral sustainable development (APC)	Formulates corporate strategies and practices aimed at sustainable business development, considering economic, environmental and social factors
Scale and horizon	Global scale, long-term perspective (decades)	National/sectoral scale, medium-term perspective (years to a decade)	Enterprise-level or enterprise cluster scale, medium- and short-term perspective (business cycles)
Application	Philosophy of science; government economic policy; international agreements; global environmental regulation	Government programs and doctrines; agrotechnological innovations; support programs for agriculture and rural areas	Corporate strategies and business models; ESG standards in management; corporate investments in sustainable technologies and projects
Implementation examples	Principle of balance among economic growth, social justice and environmental protection (UN sustainable development paradigm)	"Digital transformation" of the agrifood sector; introduction of climate-adaptive technologies (e. g. drought-resistant crops); agroecology; bioeconomy development; creation of circular agro-ecosystems	Agro-holdings transitioning to carbon-neutral production; adoption of water-saving technologies in agriculture; corporate environmental management systems; ESG reporting and auditing in food industry enterprises
Definition of "sustainable development"	A multi-component process of balanced evolution of society and economy, based on systemic integration of economic, social and environmental factors, aimed at meeting the current needs of humanity while preserving natural resource potential and preventing harm to future generations.	A dynamic and purposeful process ensuring long-term food security of the country and effective functioning of the agrifood sector through balanced reproduction of economic, environmental and social factors (while preserving resources for future generations).	A process of balanced economic growth and adaptation of business activities of an enterprise, ensuring long-term economic efficiency, environmental safety and social responsibility of the business (based on rational use of resources, innovation and consideration of stakeholders' interests).

This classification allows linking theoretical principles with practical mechanisms, forming a holistic model of a sustainable agricultural sector.

As seen from Table 2, the sustainable development paradigm operates at a meta-scientific level with a focus on global balance; the sectoral concept concretizes these principles in agricultural strategies; and the corporate level translates them into business management and practices. All levels share the idea of balanced development and ensure that sustainability principles are integrated from the global agenda down to the enterprise.

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4 CONCLUSIONS

The study emphasized that rational use of resource potential and introduction of innovations are key factors for sustainable development of the agrifood sector under current conditions. Russia's agrifood system plays a crucial role in achieving global sustainable development goals – first and foremost the eradication of hunger, food security and economic growth. Positive trends have appeared in recent years: the share of the population experiencing food shortages has declined, and the production and export of agricultural products have grown. At the same time, challenges remain: to maintain national food security it is necessary to ensure uninterrupted logistics chains and remove trade barriers for agrifood products, especially under foreign economic restrictions. Russian state policy is already oriented towards climate adaptation of agriculture, ecological transformation and responsible investing, but the sector still shows a noticeable dependence on traditional technologies and the hydrocarbon economy. A gradual transition to low-carbon and resource-saving models of agribusiness is required, which should be implemented without significant social risks for rural areas (for example, through the creation of green jobs and retraining programmes).

From a scientific standpoint, one result of this work is the systematization of theoretical foundations of sustainable development as applied to the agricultural sector. The novelty of the study lies in a comprehensive approach to analyzing the sustainability of the agrifood sector, combining the institutional level (policy, regulatory frameworks, international goals) and the corporate level (enterprise strategies and indicators). We propose the interpretation of "sustainable development of an enterprise in the agrifood sector" as an institutionally conditioned process that combines economic growth with social responsibility and environmental safety. This interpretation places special emphasis on the informational (knowledge) component – introduction of innovations and knowledge management are considered necessary conditions for the sustainability of modern agribusiness.

The study also proposed a three-level model (paradigm – sector – enterprise) that links global principles with local practical measures of sustainable development. This approach provides a methodological contribution by eliminating the gap between macro- and micro-level sustainability analysis. Moreover, the analysis of various definitions highlighted the systemic aspects of corporate sustainability: integration of sustainable development goals into strategic management, stakeholder orientation, technological and social innovations as the basis for long-term sustainability, as well as rethinking business performance criteria (shifting from narrowly financial indicators to accounting for environmental and social impact). Novelty is also evident in emphasizing institutional mechanisms – creating conditions (economic, legal) that stimulate enterprises to reduce risks and strengthen competitive advantages in a changing environment.

The practical recommendations stemming from this research may be useful for both government authorities and agrifood enterprises. At the institutional level, it is recommended to continue adapting international sustainability standards to Russian conditions: developing clear and measurable sustainability indicators for agriculture, integrating ESG requirements into state support programmes for the agrifood sector, and encouraging enterprises that demonstrate high environmental and social performance (through concessional financing, procurement priority, etc.). An important direction is the development of infrastructure and a legislative basis for the circular economy in the agrifood sector – stimulating processing of agricultural waste, production of bio-fertilizers and rural bioenergy.

At the corporate level, agribusiness enterprises should more actively incorporate ESG principles into management practice. It is recommended to integrate sustainable development indicators into the company's system of key performance indicators (KPIs), and to conduct regular assessment and audit of environmental and social risks. Non-financial reporting needs to be developed – transparent disclosure of information on environmental expenditures, energy use, emissions and social programmes – which enhances investment attractiveness and partner trust. It is also recommended to implement training programmes for staff aimed at building a culture of sustainable development within the organization.

Particular attention must be paid to innovations: investment in low-carbon agrotechnologies, precision farming systems and digital farm management platforms can significantly enhance both the economic and environmental performance of enterprises. Expanding partnership and cooperation practices among enterprises, academia and government (public-private partnerships) will allow pooling resources for large-scale sustainable projects (e. g. land reclamation, development of waste recycling systems, breeding of resilient crop varieties). Finally, an important practical measure is involving local communities and farmers in implementing sustainable development programmes – through education, consultations, support for agricultural cooperatives, rural tourism development, etc., which will ensure social sustainability of rural areas alongside economic and environmental sustainability.

In conclusion, it should be noted that sustainable development of the agrifood sector is an interdisciplinary, multi-level challenge. Its successful resolution is possible with the simultaneous development of institutions (effective policies and regulatory frameworks), technologies (innovations to increase resource efficiency and reduce environmental load) and corporate governance (strategies that take society's long-term interests into account). The results of this study contribute to sustainable development theory as applied to agricultural economics and can serve as a basis for further research – for example, quantitative modelling of the link between ESG practice adoption and agribusiness production-financial indicators, or analysis of best practices of corporate sustainability in agriculture. The practical implementation of the proposed approaches will help form a competitive, socially responsible and environmentally safe agrifood sector in Russia, capable of making a significant contribution to achieving national and global sustainable development goals.

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