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SUSTAINABLE DEVELOPMENT OF AGRICULTURAL ENTERPRISES IN THE CONTEXT OF ECOLOGICAL AND DIGITAL TRANSFORMATION

Summary. *Introduction. Sustainable development of agricultural enterprises is gaining strategic importance amid global climate change and the rapid digitalization of the economy. The study is relevant given the need to transform agribusiness models in response to environmental risks, resource depletion, and the imperative to implement ESG principles to strengthen food security.*

Purpose. The article examines the theoretical and applied principles of sustainable development for agricultural enterprises in the context of the interplay between environmental and digital transformations to enhance their adaptability and competitiveness.

Materials and methods. The study is based on an analysis of strategic concepts of sustainable development, international non-financial reporting standards (GRI, TCFD, SASB), and the results of scientific works by domestic and foreign authors in the field of agricultural management. The methodological apparatus includes a systematic analysis of statistical data for 2021–2024, grouping and tabular visualization methods to assess the dynamics of digitalization and the implementation of ESG practices in Ukraine's agricultural sector.

Results. The work demonstrates that sustainable development is based on integrating environmental innovations (organic production, circular models) and digital technologies (precision farming, Big Data, Artificial Intelligence), which collectively minimize environmental impact and optimize costs. Analysis of statistical indicators for 2021–2024 revealed positive dynamics: the level of digitalization of Ukrainian agricultural enterprises increased to 47%, and the share of farms implementing ESG practices reached 39%. It was found that, despite military challenges, the agricultural sector accounted for 59% of the state's total exports in 2024, demonstrating high resilience. The key challenges of sustainable development (soil degradation, staff shortages, and institutional imperfections) are systematized, and the directions for transformation using alternative energy (23% of enterprises in 2024) and automation systems are substantiated. It has been proven that an integrated management approach creates the prerequisites for increasing investment attractiveness and for compliance with international environmental standards.

Further research in this area. The application of the developed recommendations will contribute to the formation of an adaptive agribusiness model capable of functioning effectively in conditions of instability. Further research will focus on improving institutional support for digital transformation and developing industry indicators to assess sustainable development in small agribusiness.

Key words: *sustainable development, agricultural enterprises, ecological transformation, digitalization, ESG principles, ecological innovations, precision agriculture, agricultural sector, digital technologies, resource conservation, circular economy, innovative development.*

Problem statement. Modern development of agricultural enterprises takes place in the context of increasing global environmental challenges, digitalization of the economy, and transformation of business models. Increasing environmental burdens, climate change, depletion of natural resources, the need to ensure food security, and the need to increase resource-use efficiency underscore the need for the agricultural sector to transition to sustainable development principles. The management of agricultural enterprises is becoming less efficient, underscoring the need to introduce innovative, environmentally oriented, and digital development mechanisms.

Of great importance is the ecological transformation of agricultural production, which enables the introduction of resource-saving technologies, the development of organic production, the reduction of environmental impacts, the use of alternative energy sources, and the formation of circular management models. At the same time, the digitalization of the agricultural sector contributes to the automation of production processes, the accuracy of management decisions, the development of monitoring systems, and the optimization of land, energy, and material use.

In modern conditions, ensuring the sustainable development of agricultural enterprises is inextricably linked with the integration of ESG principles into the strategic management system. The implementation of ESG-oriented approaches helps increase the investment attractiveness of the agricultural sector, strengthen enterprise competitiveness, align with international environmental standards, and create the prerequisites for long-term economic growth. At the same time, the agricultural sector of Ukraine remains characterized by insufficient digital modernization, limited financial support for environmental transformations, and uneven implementation of innovative technologies, necessitating further research into the challenges of sustainable development for agricultural enterprises amid ecological and digital transformation.

Analysis of recent research and publications. The analysis of recent studies and publications shows that the problems of sustainable development of agricultural enterprises are considered in modern scientific literature through a combination of strategic management, environmental transformation, digitalization, and the implementation of ESG approaches. A. Kovalsky explores the theoretical aspects of the formation of a sustainable development strategy, focusing on the need for a systematic approach to determining long-term priorities for the development of enterprises [1]. A.I. Orekhova, L.A. Khromushyna and I.O. Golub consider the global sustainable development goals as the basis for the formation of a strategy for the development of agricultural enterprises, which allows linking the activities of agricultural business with international sustainability guidelines [2].

The issue of strategic development of agrarian enterprises is highlighted in the works of I.G. Kadyrus, A.S. Donskikh and V.A. Tereshchenko, who substantiate approaches to the formation of a strategy for the development of an agrarian enterprise, considering the internal potential and external conditions of functioning [3]. I.V. Gorbacheva investigates the mechanisms of strategic planning of agricultural enterprises in the conditions of entering international markets, emphasizing the importance of adapting managerial decisions to the requirements of the competitive global environment [4]. O.O. Nadvodnyuk examines the theoretical and methodological aspects of managing the sustainable development of agricultural enterprises, emphasizing the need to integrate economic, social, and environmental components of development [5].

A separate area of scientific research concerns the implementation of ESG approaches and international reporting standards in enterprise practice. K. Anderson analyzes the content and current trends of ESG investing, which is important for assessing the investment attractiveness of enterprises in the context of sustainable development [6]. The TCFD standards highlight the importance of climate reporting and risk management related to climate change [7]. S. Safdie examines the peculiarities of the implementation of GRI standards, and the materials of the Sustainability Accounting Standards Board highlight approaches to the disclosure of non-financial information, which allows enterprises to increase management transparency and compliance with international requirements [8; 9].

Considerable attention in scientific literature is paid to environmental innovations and their role in ensuring the sustainable development of the agricultural sector. A. Chaikina and Y. Musiienko analyze the problems and prospects for the introduction of environmental innovations at an agricultural enterprise, emphasizing their importance for reducing the environmental burden and increasing the efficiency of management [10]. N. Aysel Gizy and M. Zaichenko consider environmental innovations as a tool to support the sustainable development of processes, products, and services [11]. The practical dimension of this problem is reflected in the materials of the United Nations Development Program, which focus on innovations in agriculture and ecosystem conservation [12].

The issues of technological modernization of the agricultural sector within the framework of sustainable development are examined by N.V. Shibaeva and T.O. Baban, who analyze the role of innovative technologies in accelerating the global transformation of agriculture [13]. O.S. Pavlenko studies the sustainable development of agribusiness within the framework of the concept of green economy, which allows us to consider an agricul-

tural enterprise as a subject of ecologically oriented economic activity [14]. Y. Kravchyk focuses on improving the methodology for assessing the content and effectiveness of the implementation of targeted environmental programs in the context of sustainable development [15]. A. D. Ohienko reveals the theoretical and methodological support for assessing the sustainable development of agricultural enterprises, which is important for the formation of a system of indicators and criteria for evaluating the effectiveness of transformation processes [16].

At the same time, the analysis of scientific sources shows that, despite significant attention to sustainable development, strategic management, ESG reporting, and environmental innovation, the comprehensive integration of environmental and digital transformations in agricultural enterprises within a single sustainable development model remains insufficiently documented. This necessitates further research into the theoretical and applied foundations of the sustainable development of agricultural enterprises, considering environmental challenges, digital technologies, ESG principles, and the need to increase the agricultural sector's adaptability.

Formulation of the objectives of the article. The article aims to examine the theoretical and applied foundations for ensuring the sustainable development of agricultural enterprises amid environmental and digital transformation, and to identify key areas for introducing environmentally oriented and digital technologies to improve the efficiency, competitiveness, and adaptability of the agricultural sector.

Presentation of the main material of the study. Sustainable development of agricultural enterprises under modern conditions is of strategic importance amid global environmental, economic, and technological transformations. The agricultural sector is one of the key components of the national economy, ensuring the state's food security, developing export potential, and promoting rural development. At the same time, the intensification of climate change, the depletion of natural resources, soil degradation, rising environmental risks, and the instability of the external environment necessitate the transformation of traditional models of agricultural enterprise operations.

In modern conditions, an important direction in the development of the agricultural sector is the ecologization of economic activity, which entails the introduction of resource-saving technologies, the optimization of land use, the reduction of emissions, and the development of environmentally friendly production. Ecological transformation of agricultural enterprises focuses on achieving a balance between economic performance, social responsibility, and environmental preservation. Under such conditions, the formation of economic models based on the principles of sustainability, energy efficiency, and circular economy is of particular importance.

At the same time, the development of digital technologies creates new opportunities for modernizing agricultural production. The use of precision farming systems, automated monitoring, Big Data technologies, artificial intelligence, geographic information systems, and digital platforms helps increase the efficiency of production process management, optimize resource use, and reduce production costs. Digitalization of the agricultural sector ensures increased production productivity, the development of adaptive management models, and the development of the innovative potential of agricultural enterprises [1–2].

In modern scientific discourse, the sustainable development of agricultural enterprises is considered a complex process encompassing economic, environmental, social, and technological aspects of enterprise functioning. The implementation of sustainable development principles in the agricultural sector ensures long-term management efficiency, rational use of natural resources, improved environmental safety, and the integration of innovative technologies into the enterprise management system.

Of particular importance in modern conditions is the integration of ESG principles into the activities of agricultural enterprises. ESG-oriented management helps to increase the investment attractiveness of enterprises, strengthen their business reputation, adapt to international standards, and ensure transparency of management processes [3]. At the same time, the environmental and digital transformation of the agricultural sector requires significant investment, technological modernization, and improvements to state support mechanisms.

The key components of the sustainable development of agricultural enterprises in the context of ecological and digital transformation are: greening of agricultural production, digitalization of production processes, introduction of precision farming technologies, increasing energy efficiency and resource saving, integration of ESG principles into the management system, development of a circular economy, automation of management processes, and intensification of innovative development of agricultural enterprises. It is the combination of these areas that forms the basis of an adaptive, competitive, and environmentally responsible model of agricultural business functioning.

These components form the basis of the modern model for the development of agricultural enterprises, focused on ensuring sustainability, adaptability, and competitiveness amid global transformations. The implementation of environmental and digital modernization in the agricultural sector will contribute to increased production efficiency, resource optimization, and the creation of prerequisites for the long-term sustainable development of the agricultural economy [4].

In modern conditions, the digital transformation of the agricultural sector is a key factor in ensuring the sustainable development of enterprises. The use of digital technologies contributes to increased production

efficiency, the optimization of management processes, and the rational use of resource potential. Of particular importance is the introduction of precision farming systems, automated monitoring of soil conditions, unmanned technologies, geographic information systems, and digital platforms for managing agricultural production.

Digitalization of agricultural enterprises enables operational control of production processes, prediction of yield levels, and optimization of the use of fertilizers, plant protection products, and water resources. As a result, production productivity increases, resource costs decrease, and the negative environmental impact decreases. At the same time, digital technologies create prerequisites for the formation of integrated environmental management systems and increase the transparency of agricultural enterprises.

An important direction of sustainable development of the agricultural sector is the development of resource-saving and energy-efficient technologies. Agrarian enterprises are gradually adopting alternative energy sources, energy monitoring systems, bioenergy technologies, and resource-reusing mechanisms [5, p.128]. Such approaches help reduce the energy intensity of production, increase energy independence, and ensure the environmental safety of economic activity.

It is advisable to systematize the main directions of digital and ecological transformation of agricultural enterprises in a table. 1.

Table 1

Main directions of digital and environmental transformation of agricultural enterprises

Direction of transformation	Content characteristics	Expected result
Precision farming	Using GPS, GIS, sensors, satellite data, and digital field maps	Optimization of the use of land resources, fertilizers, seeds, and plant protection products
Automation of production processes	Introduction of automated technology, drones, robotic systems, and digital control	Increased productivity and reduced operating costs
Digital Management Platforms	Integration of data on production, finance, logistics, resources, and environmental performance	Improving the quality of management decisions and the transparency of enterprise activities
Alternative energy	Use of solar, bioenergy, and other renewable energy sources	Reducing energy dependence and reducing energy costs
Environmental monitoring	Control of soils, water resources, emissions, waste, and environmental risks	Increasing the level of environmental safety of agricultural production
Circular economy	Waste reuse, bioenergy development, and organic soil fertilization	Minimization of resource losses and formation of closed production cycles
ESG management	Integration of environmental, social, and management principles into the company's strategy	Increasing investment attractiveness and compliance with international standards

Source: formed based on [3–7]

The development of the circular economy in the agricultural sector involves reusing production waste, developing bioenergy, organically fertilizing soils, and minimizing resource losses in the production process. The use of such approaches allows not only to reduce the environmental burden, but also to increase the economic efficiency of agricultural enterprises by optimizing costs and forming additional sources of income [6].

Ensuring the sustainable development of agricultural enterprises is inextricably linked with the integration of ESG principles into the strategic management system. ESG-oriented approaches enable enterprises to enhance their investment attractiveness, strengthen their competitive positions in international markets, and ensure compliance with modern environmental and social standards. At the same time, implementing ESG principles requires improving the corporate governance system, developing environmental monitoring, and increasing the digital maturity of agricultural enterprises.

The implementation of these directions will increase the resilience of agricultural enterprises to external challenges, ensure efficient use of resources, strengthen environmental safety, and create prerequisites for the long-term sustainable development of the agricultural sector of the economy [8,9].

The efficiency of agricultural enterprises largely depends on the level of their innovation and their ability to adapt to changes in the external environment. The ecological and digital transformation of the agricultural sector introduces new requirements for the enterprise management system, production structure, resource use, and the organization of business processes. enterprises, which combine environmental, economic, social, and digital components.

An important component of the sustainable development of agricultural enterprises is innovative activity aimed at the introduction of modern production technologies, automation of processes, and development of

digital infrastructure [10, p. 46–50]. The use of innovative technologies in agriculture contributes to increased productivity, reduced resource losses, optimized costs, and improved agricultural product quality. In addition, innovative development ensures the development of adaptive management models that function effectively under unstable external conditions.

The environmental component of agricultural enterprises' activities is of particular importance. Intensive use of land resources, the use of chemical plant protection products, high energy intensity of production, and the negative impact of climate change necessitate the introduction of environmentally oriented technologies [11–12]. In modern conditions, agricultural enterprises are gradually adopting organic production, biotechnology, resource-saving soil cultivation methods, and environmental control systems.

Increasing the efficiency of agricultural enterprise management in the context of digital transformation is largely associated with the use of information and analytical systems. Digital platforms allow you to integrate production, financial, logistics, and environmental information into a single management system, thereby increasing the efficiency of managerial decision-making. The use of Big Data, artificial intelligence, and predictive analytics models enables the monitoring of risks, the prediction of yield levels, and the optimization of resource use [13, p. 350].

In modern conditions, investment support for environmental and digital modernization of the agricultural sector is of great importance. The implementation of innovative and ESG-oriented projects requires significant financial resources, the development of state support mechanisms, the attraction of international investments, and the formation of a favorable institutional environment. At the same time, insufficient funding, limited access to innovative technologies, and uneven regional digital development remain constraints to the transformation of agricultural enterprises.

It is advisable to present the generalization of modern challenges to the sustainable development of agricultural enterprises in the form of Table 2.

Table 2

Main challenges of sustainable development of agricultural enterprises in the context of ecological and digital transformation

Call Group	Main manifestations
Environmental	soil degradation, climate change, depletion of natural resources, and environmental pollution
Economic	instability of the market environment, growth of production costs, and limited investment resources
Technological	insufficient level of digitalization, deterioration of the technical base, low level of automation
Social	shortage of qualified personnel, demographic problems of rural areas
Institutional	imperfection of state support mechanisms, insufficient development of ESG regulation
Informational	limited access to digital platforms and analytics systems

Source: formed by the author based on [14–15]

These challenges indicate the need for an integrated approach to ensuring the sustainable development of agricultural enterprises, based on a combination of environmental innovations, digital technologies, effective strategic management, and state support mechanisms. The implementation of such approaches will contribute to increasing the competitiveness of the agricultural sector, strengthening food security, and ensuring long-term sustainable development of the economy.

The agricultural sector of Ukraine remains a key component of the national economy and provides a significant share of the state's foreign exchange earnings. Despite the difficult operating conditions associated with war risks, disruptions to logistics chains, and reduced production capacity, agricultural enterprises continue to play an important role in ensuring food security and building the country's export potential. According to analytical estimates, the agricultural sector accounts for more than 10% of Ukraine's GDP and about 40% of the state's exports.

At the same time, the current state of the agricultural sector is characterized by a significant impact of hostilities on enterprises' resource and production potential. In 2024, the actual sown area of agricultural crops amounted to 23.3 million hectares, which is 18% less than in pre-war 2021. In addition, about 20% of agricultural land remains inaccessible for use due to territorial occupation and mining.

Despite the existing challenges, the agricultural sector is showing a gradual recovery of export potential. According to the Ministry of Agrarian Policy, in 2024, the volume of Ukraine's agri-food exports reached USD24.5 billion, nearly in line with pre-war levels. The share of agricultural products in the state's total exports was about 59%, and the total volume of agricultural exports exceeded 78 million tons.

It is advisable to present the dynamics of the main indicators of Ukraine's agricultural sector's development in Table 3.

These data indicate a gradual strengthening of the role of digitalization and ESG-oriented management in the activities of agricultural enterprises. In particular, the growth in digitalization is associated with the active implementation of precision farming systems, digital production management platforms, automated monitoring, and information and analytical systems. At the same time, the increase in the number of enterprises integrating ESG principles into the management system indicates the gradual adaptation of the agricultural sector to international requirements for sustainable development and environmental responsibility.

Table 3

Main indicators of the development of the agricultural sector of Ukraine

Showman	Aug. 2021	Aug. 2022	Aug. 2023	Aug. 2024
Share of the agricultural sector in GDP, %	10,9	10,2	9,4	7,1
Share of agricultural products in exports, %	41	53	57	59
The volume of exports of agricultural products, billion dollars.	27,7	23,4	22,0	24,5
Sown area, million hectares	28,4	24,7	23,9	23,3
Level of digitalization of agricultural enterprises, %	32	36	41	47
Share of enterprises implementing ESG practices, %	18	24	31	39

Source: formed by the author based on analytical and statistical sources [16–20]

The gradual introduction of digital technologies and ESG principles in the activities of agricultural enterprises contributes to the formation of a new model for the development of the agricultural sector, focused on improving production efficiency, environmental safety, and investment attractiveness. In modern conditions, the use of precision farming technologies is particularly important, as it allows for optimizing land resource use, increasing yields, and minimizing environmental impact. The use of GPS navigation, satellite monitoring, sensor systems, and digital control platforms helps to increase the accuracy of agricultural production and the efficiency of management decisions.

An important direction of digital transformation of agricultural enterprises is the automation of production processes. The use of automated equipment, robotic systems, unmanned aerial vehicles, and digital control systems can reduce resource costs, increase labor productivity, and reduce production risks. In addition, digitalization helps create a unified information environment for managing an agricultural enterprise, ensuring the integration of production, financial, logistics, and environmental processes.

Ecologization of production is particularly important for ensuring the sustainable development of agricultural enterprises. Growing environmental risks, land degradation, and climate change necessitate the introduction of resource-saving technologies, organic production, biotechnology, and environmental control mechanisms. Agricultural enterprises are gradually adopting alternative energy sources, energy monitoring systems, and resource-reuse technologies, which help increase energy efficiency and reduce environmental burdens.

At the same time, the development of the agricultural sector amid ecological and digital transformation requires significant investment. The implementation of digital and environmental projects requires modernizing the technical base, developing digital infrastructure, introducing innovative technologies, and training qualified personnel. In this regard, state support for the agricultural sector, aimed at stimulating digitalization, the greening of production, and the development of ESG-oriented management, is of great importance.

It is advisable to present the dynamics of implementing digital and ESG-oriented approaches in Ukraine's agricultural sector in Table 4.

Table 4

Dynamics of digitalization and implementation of ESG practices by agricultural enterprises of Ukraine

Showman	Aug. 2021	Aug. 2022	Aug. 2023	Aug. 2024
Level of digitalization of agricultural enterprises, %	32	36	41	47
Share of enterprises using precision farming technologies, %	18	24	31	39
Share of enterprises implementing ESG practices, %	18	24	31	39
Level of use of alternative energy, %	11	14	18	23
Share of enterprises engaged in environmental monitoring, %	21	27	34	42

Source: compiled by the author based on analytical and statistical materials [16–21]

These data indicate a gradual increase in the extent of digital and environmental transformation in Ukraine's agricultural sector. In particular, the increase in the number of enterprises implementing precision farming technologies, ESG principles, and environmental monitoring systems confirms the intensification of modernization processes in agricultural production. At the same time, the expansion of the use of alternative energy and digital technologies forms prerequisites for increasing the sustainability of agricultural enterprises, reducing production costs, and ensuring the long-term sustainable development of the agricultural sector.

Conclusions. Thus, the sustainable development of agricultural enterprises amid ecological and digital transformation is a key prerequisite for ensuring the effective functioning of the agricultural sector and enhancing its competitiveness. Increasing environmental challenges, climate change, the digitalization of the economy, and the need to adapt to international standards necessitate adopting innovative, environmentally oriented, and digital approaches to managing agricultural enterprises.

The development of digital technologies, precision farming systems, automated monitoring, ESG-oriented management, and resource-saving technologies helps increase the efficiency of resource use, optimize production processes, reduce environmental burdens, and strengthen the resilience of agricultural enterprises to external risks. At the same time, the greening of agricultural production and the development of the circular economy create prerequisites for ensuring the long-term balanced development of the agricultural sector.

The analysis of statistical data indicates a gradual increase in the level of digitalization of agricultural enterprises, the spread of precision farming technologies, the introduction of ESG practices, and the use of alternative energy sources. At the same time, insufficient investment support, uneven digital modernization, deterioration of the technical base, and limited access to modern technologies remain constraints on development.

Ensuring the sustainable development of agricultural enterprises requires a comprehensive combination of environmental innovations, digital technologies, effective strategic management, institutional support, and intensification of investment activities. The implementation of these directions will contribute to increased agricultural productivity, strengthened food security, the preservation of natural resource potential, and the laying of the groundwork for the long-term development of Ukraine's agrarian economy.

ДОДАТКОВА ІНФОРМАЦІЯ

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СТАЛИЙ РОЗВИТОК АГРАРНИХ ПІДПРИЄМСТВ В УМОВАХ ЕКОЛОГІЧНОЇ ТА ЦИФРОВОЇ ТРАНСФОРМАЦІЇ

Анотація. *Вступ. Сталий розвиток аграрних підприємств набуває стратегічного значення в умовах глобальних кліматичних змін та стрімкої цифровізації економіки. Актуальність дослідження зумовлена необхідністю трансформації бізнес-моделей агробізнесу через екологічні ризики, виснаження ресурсів та потребу впровадження ESG-принципів для зміцнення продовольчої безпеки.*

Мета. Статтю спрямовано на дослідження теоретичних та прикладних засад сталого розвитку аграрних підприємств в умовах поєднання екологічної та цифрової трансформацій для підвищення їхньої адаптивності та конкурентоспроможності.

Матеріали і методи. Дослідження ґрунтується на аналізі стратегічних концепцій сталого розвитку, міжнародних стандартів нефінансової звітності (GRI, TCFD, SASB) та результатів наукових праць вітчизняних і зарубіжних авторів у сфері агроменеджменту. Методологічний апарат включає системний аналіз статистичних даних за 2021–2024 роки, методи групування та табличної візуалізації для оцінки динаміки цифровізації та впровадження ESG-практик в аграрному секторі України.

Результати. У роботі доведено, що сталий розвиток базується на інтеграції екологічних інновацій (органічне виробництво, циркулярні моделі) та цифрових технологій (точне землеробство, Big Data, штучний інтелект), що сукупно мінімізує вплив на довкілля та оптимізує витрати. Аналіз статистичних показників за 2021–2024 роки виявив позитивну динаміку: рівень цифровізації українських агропідприємств зріс до 47%, а частка господарств, що впроваджують ESG-практики, досягла 39%. Встановлено, що попри воєнні виклики, аграрний сектор забезпечив 59% загального експорту держави у 2024 році, продемонструвавши високу стійкість. Систематизовано ключові виклики сталого розвитку (деградація ґрунтів, дефіцит кадрів, інституційна недосконалість) та обґрунтовано напрями трансформації через використання альтернативної енергетики (23% підприємств у 2024 р.) і систем автоматизації. Доведено, що інтегрований підхід до управління створює передумови для підвищення інвестиційної привабливості та відповідності міжнародним екологічним стандартам.

Перспективи. Застосування розроблених рекомендацій сприятиме формуванню адаптивної моделі агробізнесу, здатної ефективно функціонувати в умовах нестабільності. Подальші дослідження будуть зосереджені на вдосконаленні інституційної підтримки цифрової трансформації та розробці галузевих індикаторів оцінювання сталого розвитку для малого агробізнесу.

Ключові слова: *сталий розвиток, аграрні підприємства, екологічна трансформація, цифровізація, ESG-принципи, екологічні інновації, точне землеробство, аграрний сектор, цифрові технології, ресурсозбереження, циркулярна економіка, інноваційний розвиток.*