Current Issues in ESG Reporting in the Context of Agriculture

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Abstract: ESG reporting is becoming more prevalent in practice. More and more companies are creating and monitoring environmental, social and governance indicators. This gives them a better chance of succeeding not only on the domestic market but also on international markets. A company's activities also have an impact on its surroundings and strong relationships are important for the successful development of business operations. A positive assessment of a company contributes to its long-term stability. Current ESG reports are undergoing a process of development and therefore differ from company to company. In our research, we focused on the trends, challenges and opportunities associated with the implementation of ESG in the agricultural sector. This study presents relevant taxonomy and legislation from the perspective of the European Union and Slovakia. We also focused on the implementation of ESG in the business environment and the reporting process. In the near future, agricultural enterprises can expect changes and adjustments to ESG reporting requirements. They should use the current transition period to adapt their enterprise information systems and create the necessary processes and tools for effective ESG reporting.

Keywords: sustainability, taxonomy, ESG reporting, enterprise, agriculture
JEL Classification: M21, O20, Q58

1 Introduction

In the current period, we are increasingly encountering ESG reporting in practice. The creation and monitoring of indicators in the field of environmental, social and management is carried out not only by companies that are required to do so by legislation. There are several reasons. One of them is the fact that still more customers are interested not only in the price and origin of the purchased products, but also in the ecological aspect of the products. Companies that follow the principles of organic production in their activities have a greater chance of succeeding not only on the domestic but also on the foreign market. Other important factors are the social and management aspects. The above aspects are also important in the internal corporate environment, and they are perceived sensitively in particular by employees. The company's activities also affect its surroundings, and the relationships it creates with customers, suppliers, buyers and other external entities are important for the successful development of its business. A positive assessment of a company contributes to its long-term stability. There are no strict rules for creating ESG reports and so it is different in individual companies. Our research is focused on agricultural sector.

2 Methods

The selected area of the presented research activity is ESG reporting and the field of agriculture. Agriculture is one of the important sectors of the national economy. Unlike other production sectors, it is characterized by the uniqueness of animal and plant production. However, the same laws and principles of business apply to agricultural enterprises as to other business entities. As part of our research activities at the Institute of Accounting and Informatics and the Institute of Economic Policy and Finance, we address the issue of ESG reporting from the perspective of current EU legislation, regulations and directives, as well as from the perspective of economic and achieving sustainability.

The main objective of the submitted contribution is to present ESG reporting from the perspective of the taxonomy of the European Union and Slovakia and the orientation towards agriculture. This goal is divided into sub-goals:

1. current ESG issues from the perspective of the European Union and Slovak legislation,

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2. specifics of agricultural production in the context of climate change impacts,
3. system requirements for compiling ESG reports in agricultural enterprises,
4. conceptual design of the ESG reporting system.

The materials used are regulations and directives of the European Union, legislation of the Slovak Republic, related scientific publications and results obtained by solving research tasks at the Institute of Accounting and Informatics and the Institute of Economic Policy and Finance in the period 2015 – 2025, research project VEGA 1/0489/15 "Increasing the effectiveness of managers' decision-making with the support of information systems and accounting", research project VEGA 1/0625/24 "Financing and insurance in agriculture: market failure and the role of policies", research project KEGA 058SPU-4/2024 "International finance and trade in agriculture". The basic research methods applied in the presented contribution are analysis, comparison, synthesis, deduction, systematic literature search, survey method - method of individual interviews with managers of agricultural enterprises, where the structured interview method was used with open questions focused on the corporate information system and reports, further system analysis of corporate information systems and information flows (basic research was carried out as part of solving the above-mentioned VEGA research tasks).

3 Research results

3.1 ESG issues in the context of taxonomy and European Union legislation

The Stockholm Conference in 1972 laid the foundation and general framework for understanding the global environmental problem. It was emphasized that environmental protection and improvement is a fundamental issue, the solution of which affects the quality of life and economic development throughout the world. The global Sustainable Development Goals (SDG Goals) are gradually gaining importance, are frequently cited and are becoming the basis for the development strategy of national and international institutions, sectors and professions. Less so for individual countries, although here they are often cited and emphasized by governments, too. The basic principles that should economic policy follow include changing the quality of economic growth, preserving and enriching basic natural resources, ensuring a sustainable population level, integrating ecological and economic aspects in decision-making, reforming international economic relations and strengthening international cooperation. The SDGs represent an important contribution to transforming the trajectory of economic and overall civilizational development on a global scale, but also for nation states. They are formulated in a comprehensive and sufficiently progressive manner. Goal 12 aims to ensure sustainable consumption and production, and Goal 13 aims to take urgent action to solve climate change and its impacts (Moldan, 2020). Climate change and environmental degradation are key global challenges of our time. Countries around the world recognize the urgent need to address these challenges. This is demonstrated by their support in the Paris Agreement and the UN 2030 Agenda for Sustainable Development (European Commission, 2025). The EU has made several ambitious commitments under the European Green Deal, notably to become the first climate-neutral continent by 2050 and to reduce greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels. The EU also aims to strengthen its resilience to climate change, reverse biodiversity loss and environmental degradation. The objective of Article 3 (3) of the Treaty on European Union is to establish an internal market which contributes to the sustainable development of Europe based, inter alia, on balanced economic growth and a high level of protection and improvement of the quality of the environment. (EurLex,2025). Porter's hypothesis states that strict government environmental regulation does not have a negative impact on the economic performance of private companies, but rather motivates them to innovations, which brings a competitive advantage in the market. It assumes that properly set strict environmental standards can stimulate innovative activities in companies, which has a positive impact on their revenues. According to Porter, these revenues not only compensate for, but often exceed, the costs associated with complying with these high environmental standards (Porter and Linde, 1995). According to Tsang et al. (2023), voluntary disclosure of non-financial information on environmental, social and governance aspects (ESG) is a rapidly developing and increasingly important topic that has attracted much attention from both academic researchers and capital market participants in recent years. Currently, the performance of a company is assessed primarily by traditional financial analysis indicators (profitability indicators, liquidity indicators, activity indicators, debt indicators and capital market indicators) or by a set of indicators, such as creditworthiness and insolvency models (indicators) or a pyramid system of indicators. Traditional indicators also include indicators assessing the efficiency of production factors (i.e. productivity indicators), of which a single-factor indicator - the labour productivity indicator - is most often used in business practice. As advanced economies move towards circularity and overall sustainability, these traditional approaches seem to be insufficient. As the demand for monitoring sustainable value creation in companies (sustainable business) grows, there is also a debate on how to appropriately extend this traditional perspective. The practical application and monitoring of the principles of sustainable value creation are still evolving. The most significant trend is the integration of environmental, social and governance (ESG) aspects. This approach is referred to as sustainable enterprise value. A significant proportion of companies (especially large corporations and multinational groups) focus not only on financial results, but also on integrating social responsibility into corporate governance and decision-making. Table 1 compares two key European sustainability directives: the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD).

Table 1 Comparison of two European sustainability directives

Directive	**CSRD - Corporate Sustainability Reporting Directive**	**CSDDD - Corporate Sustainability Due Diligence Directive**
Designation	2022/2464/EU	2024/1760/EU
Objective	Ensure transparent and comparable sustainability reporting	Initiate an obligation to identify and solve negative impacts on human rights and the environment
For whom	Large enterprises, listed companies, some SMEs	Large enterprises with more than 1000 employees and turnover over 450 million EUR
Areas of coverage	ESG factors (environmental, social, governance)	Human rights, working conditions, environmental damage throughout the value chain
Obligations	Disclosure obligations	Duty to act (due diligence, corrective action)
Effectiveness	Gradually from 2024 according to the size of the company	Transposition by July 2026, entry into force from 2027
Sanctions	Fines for failure to comply with the obligation to disclose	Fines, civil liability for damages
Link to other standards	Follow up on NFRD, is in accordance with EFRAG standards	Complements CSRD, follow up on international frameworks such as OECD and UN

Source: Own processing

The CSRD (Corporate Sustainability Reporting Directive) is a key EU legislative instrument that is dramatically changing the area of non-financial reporting and has a global impact. The CSRD is inherently a transformative legal act, aiming to move companies away from voluntary and often superficial "greenwashing" towards systematic, transparent and verifiable sustainability reporting. Although it poses significant challenges, its long-term goal is to redirect capital towards sustainable investments and contribute to achieving the goals of the European Green Deal. Current trends in relation to CSRD include expanding the scope of reporting to:

- all large companies (which meet at least two of the three criteria: more than 250 employees, turnover over 40 million EUR, assets over 20 million EUR).
- listed small and medium-sized enterprises (SMEs), with a deferred application and potentially simplified standards.
- companies from non-EU countries that have a significant branch or subsidiary in the EU and meet the turnover criteria.

This trend means that more companies, including suppliers to large companies, will be required to collect and report ESG data. A new reporting trend is the concept of double materiality, which means that companies must report not only on how environmental and social factors affect their financial performance (financial materiality), but also on how their own activities affect the environment and society (impact materiality). This holistic view is key to reporting and distinguishes CSRD from other global frameworks that primarily focus on financial materiality. According to Rábek et al. (2024) on 10 November 2022, the European Parliament approved a new Corporate Sustainability Reporting Directive, called the CSRD, which replaces the current Non-Financial Reporting Directive (NFRD). CSRD brings new requirements for the disclosure of non-financial data for a wider range of companies. Another trend is digital tagging and machine readability: Sustainability reports must be prepared in electronic XHTML format and digitally tagged (XBRL tagging) in accordance with the EU taxonomy. The aim is to make the data machine-readable, easily analyzable for investors, analysts and regulators. It is also important to mention that CSRD is not isolated and is closely linked to other EU legislative initiatives, such as the EU Taxonomy for Sustainable Investments and will also be linked to the upcoming CSDDD (Corporate Sustainability Due Diligence Directive), which will require due diligence in the supply chain. The new ESG Directive (ESG Slovakia, 2025) is fundamentally changing the way companies look at their responsibilities. By promoting ethical standards, transparency and accountability, it creates pressure to build a more sustainable and fair business environment. Companies that adopt this new approach will not only minimize risks and enhance their reputations but will also actively contribute to creating a more ethical global economy. The CSDDD Directive represents a fundamental move from voluntary social responsibility to binding and enforceable rules. While its implementation will be challenge for companies, its long-term goal is to create a fairer and more sustainable global economy. The CSDDD Directive imposes a comprehensive set of obligations on companies that transform a passive approach to ethics into an active management process (ESG Klub, 2025).

First, companies must thoroughly identify the risks associated with human rights violations and environmental damage, not only within their own operations but also across their entire supply chain. These findings must then be integrated into their internal policies and management systems. At the same time, the directive requires the introduction of a binding Code of Conduct that clearly defines ethical principles and rules. This code does not only apply to the company itself and its subsidiaries, but its compliance must also be required from business partners and suppliers, and companies must put in place mechanisms to verify this compliance. Transparency and responsibility are also key components. Companies must communicate openly about their actions and ensure a functioning redress system that allows for complaints to be resolved and victims to be compensated. In addition, all stakeholders, from employees to suppliers, must be actively involved in the entire process. With increasing pressure for transparency and sustainability, Slovak agricultural enterprises are increasingly facing reporting requirements. The Common Agricultural Policy (CAP) is currently becoming a key instrument for achieving the objectives of the European Green Deal. Slovak agriculture is expected to demonstrate higher ambitions in the field of environmental and climate protection through its strategic plan. This plan must directly contribute to the objectives of well-known strategies such as "Farm to Fork" and the "EU Biodiversity Strategy". The European Commission has formulated several key recommendations for Slovakia in this regard. The main priorities include reducing greenhouse gas emissions, better adapting to climate change, and increasing the country's ability to sequester carbon.

3.2 Specification of agricultural production in the context of climate change impacts

There is also a focus on protecting and restoring biodiversity, mainly by supporting natural features in the agricultural landscape. Other important goals include significantly reducing the use of pesticides, switching to organic farming and introducing more ambitious measures to improve animal welfare. The Commission also recalls the need for sustainable forest management and support for rural development, for example by improving access to fast internet (Pokrivčák et al., 2022). The EU and Slovak agricultural sector currently face several specific challenges that make it significantly more complex than other sectors. From collecting data on vast and diverse farms to the complexity of supply chains, farmers face unique challenges in measuring and reporting their environmental, social and governance impacts. ESG reporting in agriculture is challenging, particularly due to direct dependence on natural ecosystems, a dispersed and often seasonal workforce, and complex value chains. The most significant challenges include - data collection and quality: Unlike an industrial enterprise with clearly defined emission sources, measuring environmental impacts in agriculture is extremely complicated. Accurately quantifying greenhouse gas emissions from livestock farming (methane), land use, or fertilizer application (nitrous oxides) requires sophisticated models and is often only an estimate. Similarly, it is difficult to track water consumption, soil erosion, or the impact on biodiversity across vast and geographically diverse areas. Complexity and transparency of supply chains: The journey of the product from farm to fork involves a multitude of intermediaries – from primary producers to processors, distributors to retailers. Ensuring traceability and obtaining accurate ESG data from all suppliers, many of whom are small farmers without reporting capacity, is one of the biggest barriers. Seasonality and variability: Agricultural production is strongly influenced by weather and other unpredictable factors. These fluctuations cause volatility in data on resource consumption (e.g., irrigation water) and yields, making it difficult to make year-to-year comparisons and set long-term goals. Lack of standardized metrics for the sector: Although there are international frameworks such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB), which have already developed specific standards for agriculture (e.g. GRI 13), their implementation is still in its early stages. European Sustainability Reporting Standards (ESRS) for the agricultural sector are still under development. This inconsistency leads to difficulties in comparing performance across companies. Despite these challenges, the introduction of ESG reporting is necessary for the agricultural sector. It not only provides a tool for managing risks and identifying opportunities for improving efficiency but is also becoming a key factor for accessing financing and maintaining competitiveness in a market that places increasing emphasis on sustainability. For Slovak agribusinesses, this means the need to invest in data collection technologies, strengthen cooperation within supply chains, and gradually adopt international standards. As Polakovič et al. (2019) state, it is also important not only for agricultural businesses to invest in the education and development of employees in terms of competitiveness, but the need also to work with qualified professionals so that the company prospers and is valuable in the market. Among other things, today's global companies place high demands on people in terms of qualifications, and it is necessary for employees to be able to flexibly adapt to the changes brought about by the changing business environment in the market. One such change is the issue of ESG reporting.

3.3 ESG issues from the perspective of mandatory financial and non-financial reporting in the Slovak Republic

The obligation to report ESG data at the national level in the Slovak Republic is stated in the Accounting Act. The Act of the National Council of the Slovak Republic No. 431/2002 Coll. on Accounting, in its current legal version (2025), deals with the issue of reporting environmental, social and governance aspects in Section (§) 20 Annual Report. The annual report contains the financial statements for the accounting period for which the annual report is prepared, the auditor's report on these financial statements (if the accounting entity must have its financial statements audited by an auditor) and, in particular, information on the development of the accounting entity, its current state, and significant risks and uncertainties to which the accounting entity is exposed. The information is provided in the form of a balanced and comprehensive analysis of the status and development forecast and contains important financial and non-financial indicators, including information on the impact of the accounting entity's activities on the environment and on employment, with reference to the relevant data presented in the financial statements. The Act defines the conditions under which banks and commercial companies are required to include in a separate, specially designated section of the annual report individual reporting of sustainability information, which includes information necessary to understand the impact of the accounting entity on sustainability aspects, including how sustainability aspects affect the development, performance and position of the accounting entity (Section 20c).

The conditions include: a bank, except for the National Bank of Slovakia, a reinsurance company and an insurance company, except for a health insurance company, a commercial company, is obliged to do so if:

a.) in each of the two immediately preceding accounting periods it meets at least two of the following conditions:

1. the total amount of assets exceeded EUR 25,000,000,

2. the net turnover exceeded EUR 50,000,000,

3. the average number of employees during the accounting period exceeded 250 or

b.) issued securities and these were admitted to trading in a regulated market of a Member State and in each of the two immediately preceding accounting periods it meets at least two of the following conditions:

1. the conditions for classification in a size group: a) the total amount of assets exceeded EUR 450,000 but did not exceed EUR 5,000,000, b) the net turnover exceeded EUR 900,000 but did not exceed EUR 10,000,000, c) the average number of employees during the accounting period exceeded 10 and did not exceed 50,

2.these conditions: 2a. the total amount of assets exceeded the amount of 5,000,000 euros, but did not exceed the amount of 25,000,000 euros, 2b. the net turnover exceeded the amount of 10,000,000 euros, but did not exceed the amount of 50,000,000 euros, 2c. the average number of employees during the accounting period exceeded 50 and did not exceed 250 or 3.these conditions:

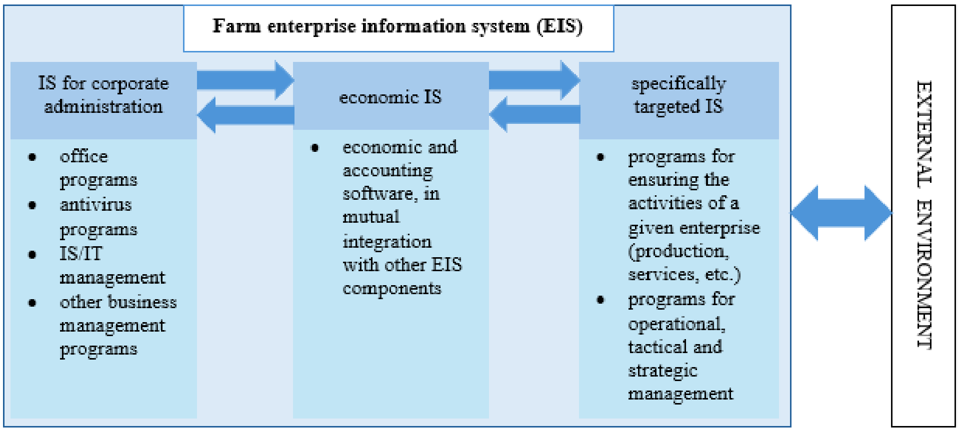
3a. the total amount of assets exceeded the amount of 25,000,000 euros, 3b. the net turnover exceeded the amount of 50,000,000 euros, 3c. the average number of employees during the accounting period exceeded 250.

The annual report of an accounting entity subject to the obligation to report data must be prepared in electronic format, and the accounting entity is obliged to mark its individual reporting of information on the sustainability of the regulation in accordance with a special regulation (EU Delegated Regulation 2019/815 as amended).

3.4 System requirements for compiling ESG reports in agricultural enterprises

The requirements for creating ESG reports in agricultural enterprises are based on generally binding standards, regulations and guidelines of the European Union and at the same time, consider the specifics of agricultural production. Before implementing ESG reporting, it is important to assess the information flows in agricultural enterprises regarding the possibilities of collecting and processing data into the required reports. This fact is largely influenced by the structure and quality of the corporate information system. Based on the interviews conducted with business managers and obtained in results of the research tasks solved, we have compiled a simplified model of the system architecture of an agricultural enterprise (Figure 1). Data flows are created between individual systems, and the systems are integrated and automated. The above is a prerequisite for incorporating ESG reporting requirements from collection, transmission, processing to archiving of documents.

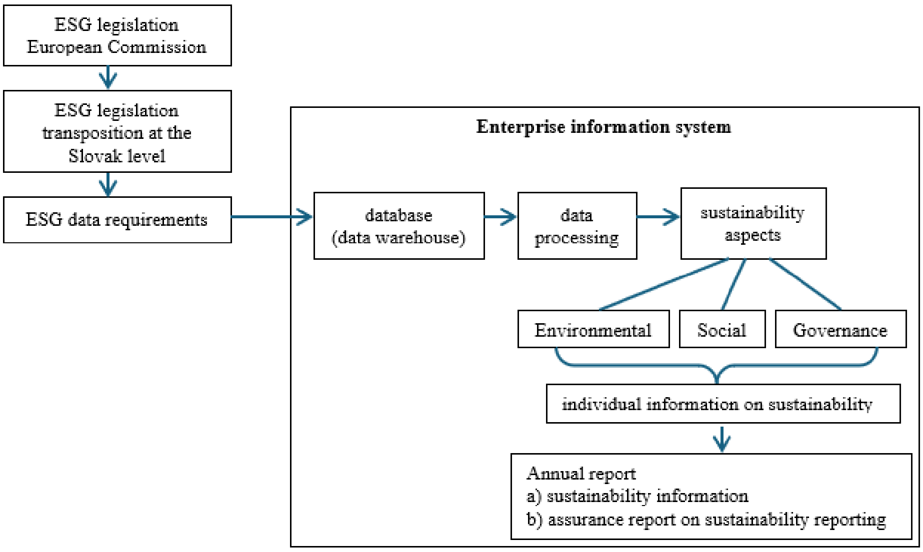
Figure 1 Simplified model of an agricultural enterprise



Source: Own processing

Credibility and verifiability of documents is a fundamental pillar for achieving positive results of ESG reporting in every area of monitoring. This is where independent verification comes into play. Setting up the process of creating ESG reporting in the interaction of the corporate information system is not a fixed process. It is not only the changing reporting requirements that are important, but also the need to (credibly) report changes that occur after evaluating previous findings and implementing measures. The seemingly identical cycle ultimately leads to improvements in the environmental, social and governance performance of the company. From a long-term perspective, the process is illustrated in Figure 2.

Figure 2 Conceptual design of an ESG reporting system in a company



Source: Own processing

4 Conclusions

Reporting information on the environmental, social and governance activities of a company is an important area of presenting business activities. The foundations of ESG reporting were formed already at 80-years of 20th century. Currently, the process of transposing ESG reporting rules from the European Commission level into the legislation of the EU member states is underway. In this paper, we present selected aspects of the taxonomy and legislation of ESG reporting. At the Slovak level, significant changes occurred in 2025, primarily in financial and non-financial reporting, which is regulated by the Act of the Slovak Parliament No. 431/2002 Coll. on Accounting. In our research, we focused on the field of agriculture and the introduction of ESG reporting into agricultural enterprises. According to the requirement for long-term monitoring of individual activities within the framework of ESG reporting, the task is to create or set up a corporate information system. The difficulty of this task for agricultural companies is influenced by the specific nature of farming and animal husbandry. According to ESG Guide for the Food and Agribusiness Sector, (2025) "ESG principles are transforming the food and agribusiness sector and forcing companies to adopt more sustainable, socially responsible and transparent practices"

ESG reporting is governed by the rules set by the EU and the rules adopted at the national level. A range of indicators is required, which follows from the methodology of the above materials. For the agribusiness sector, ESG factors are an important part of today's business. ESG refers to a set of standards that measure a company's impact on the environment, its social responsibility and its management. In agribusiness, this means focusing on sustainable practices, fair working conditions and ethical decision-making (ESG Guide for the Food and Agribusiness Sector, 2025). Currently, programs are being developed, the implementation of which in the corporate information system will accelerate the process of introducing and monitoring the status and development of individual ESG indicators. For agricultural enterprises, for example, the FarmCloud platform (Introduction to ESG Reporting in Agriculture, 2025) enables effective management of ESG data, automation of the reporting process, access to advanced analytical tools, helps to meet not only formal requirements, but also actively improve environmental and social results. FarmCloud can be considered a significant tool to support modern agriculture in adapting to ESG requirements.

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