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THE INTEGRATION OF ENVIRONMENTAL, SOCIAL AND GOVERNANCE (ESG) PRINCIPLES INTO FARM MANAGEMENT: A GENERAL OVERVIEW

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Abstract

The last decade's development and implementation of non-financial reporting culminated in the approval of the Corporate Sustainability Reporting Directive (CSRD) and the European Sustainability Reporting Standards (ESRS). These have become mandatory for large companies, but it is estimated that in the future all companies will have to consider environmental, social, and governance (ESG) factors in the management process. The CSRD, effective from January 2024, aligns sustainability reporting with financial reporting, requiring standardized disclosures on ESG issues. This paper explores the challenges and opportunities of the future implementation of ESG standards in agricultural companies. Key issues include data collection, compliance costs, and the need for sector-specific reporting. Despite these challenges, ESG reporting offers potential benefits such as improved reputation, risk management, and market access. The paper assesses current practices and future directions for integrating ESG in agriculture, highlighting the need for improved reporting frameworks and methodologies.

Key words**:** *sustainability reporting, ESG factors, ESRS, agricultural management*

INTRODUCTION

Agriculture is the most important activity in human society, and farm management has become a vital endeavor for the efficient acquisition of food, fiber, fuel, etc. Interest in sustainable farm management has increased in recent decades, with a focus on concerns related to rural communities, ecosystems, biodiversity, ethics, technology, and agricultural policy. Under these conditions, we can say that farm management has become a complex process, depending on the different approaches to it. In general, however, it is considered that agriculture requires a sustainability-oriented approach that includes the management of biological, financial, social, etc. resources [19].

Given that agricultural policies and certification systems require information that demonstrates farm sustainability and the relationship with the environment, researchers in the specialized literature draw attention to the gaps between the data required for sustainability reporting and farm data management [27]. Currently, agriculture requires the provision of data on food security management (GlobalGap), evidence of cross-compliance requirements for direct payments and eco-schemes, and evidence of corporate sustainability on suppliers, among other things. Software designed to provide all this necessary information to support the management process can generally be used by large farms due to both utility and cost. These are not typically available or adaptable for families and small businesses. On the other hand, farm accounting does not provide much of the information needed to measure sustainability either. In fact, according to Poppe et al. [27], key performance indicators on a farm's sustainability performance integrate information from both farm financial accounting and farm management systems, which makes reporting very difficult.

In terms of environmental impact, we often focus on pollution from the energy sector, but many studies indicate that the agri-food sector

has the greatest impact on maintaining environmental stability, contributing to deforestation and pesticide contamination of land, an increase in the number of endangered species, depletion of freshwater resources, etc. [13]. Under these conditions, increasing promotion of ESG principles in governmental and corporate commitments is estimated to support achieving sustainable development goals. We predict that the environmental, social, and governance (ESG) policies of firms across the agri-food sector will influence their future performance.

However, to impact ESG performance over the medium and long term, strategic integration of sustainability considerations is essential [1].

There is not much research that analyzes how the internal management of companies incorporates elements of sustainability, but the existing ones suggest the following: it is necessary to expand the analysis to the level of all interested parties, such as management members, shareholders, employees, competitors, etc. [16]; ESG performance does not always translate into higher profits [14]; increased ESG performance attracts capital [26].

In this context, the purpose of this paper is to explore the challenges and opportunities of the future implementation of ESG standards in agricultural companies.

MATERIALS AND METHODS

This study uses a mixed methods approach to evaluate how well agricultural enterprises integrate ESG requirements. It includes case studies of early adopters of ESG reporting, interviews with industry experts, and a review of the body of research on European non-financial reporting standards. The requirements and implications of CSRD and ESRS for agricultural enterprises are the main topics of the literature review. We gathered information from various sources such as scholarly articles, industry reports, and regulatory records. The papers underline the advantages and practical difficulties of implementing ESG and take into consideration both major agricultural firms and smaller farms that have begun to use ESG principles. Finding recurring themes and problems, such as troubleshooting data collection, reporting expenses, and sector-specific obstacles, was part of the analysis. The study also scrutinized comparative practices in other industries to identify commonalities and optimal practices that agriculture could adopt.

RESULTS AND DISCUSSIONS

European non-financial reporting standards

Agriculture is a vital human activity, and farm management is crucial for acquiring food, fiber, and resources. Sustainable farm management has gained interest in recent decades, focusing on issues affecting rural communities and ecosystems. To ensure long-term sustainability and mitigate negative effects on the environment, society, and economy, it has become imperative to assess and measure an entity's sustainability performance, which reflects how well it incorporates environmental, social, and economic factors in operational activities. To promote transparency and accountability in the field of financial performance, the Non-Financial Reporting Directive (NFRD) was developed in 2014. The reporting allowed companies to track their sustainability performance and develop sustainability management. The Corporate Sustainability Reporting Directive (CSRD) (2022/2464/EU) [7] replaced Directive (2014/95/EU (NFRD) [6], placing sustainability reporting on par with financial reporting. The CSRD Directive aims to standardize reporting and enable simple comparison of sustainability data on environmental, social, and governance issues. On January 1, 2024, the Corporate Sustainability Reporting Directive (CSRD) (the law requiring reporting) and the European Sustainability Reporting Standards (ESRS) (the framework followed to meet the CSRD) came into force.

The CSRD requires the creation of a management plan focused on sustainability on the standardized model of the ESRS, which must include elements such as the business strategy, the sustainability objectives set by the company, the role of the people involved in the management of the company in ensuring

sustainability, the company's policies, the due process diligence implemented by the company, risks in ensuring sustainability based, etc. Starting in 2025 (for the financial year 2024), the obligation to report appears only for companies with more than 500 employees that are either public interest institutions or non-EU entities listed on European markets. In the next year, companies that meet two of the following criteria will have to report: over 250 employees, turnover of over 40 million euros, and total assets of over 20 million euros. From 2027, listed small and medium enterprises will report, and from 2028, regulations will be introduced for other categories of companies. Given these circumstances, we anticipate that all EU market companies will submit this sustainability report within a few years, particularly if they commit to maintaining their climate neutrality until 2050.

In July 2023, the first set of 12 ESRS standards ("two transversal standards and 10 thematic standards") was adopted, the sectoral ones and those intended for SMEs to be approved only in 2026. These standards aim to provide a transparent picture, precise and comparable regarding the impact on the ESG (environmental, social, governance) domains. According to (Denkstatt the ESRS indicators are based on already established standards and frameworks, such as: GRI ("The global standards for sustainability impacts"), SASB ("Sustainability Accounting Standards Board"), TCFD ("Task Force on Climate-Related Financial Disclosures"), GES provisions (Greenhouse Gases), Carbon Disclosure Project, etc. [5].

The transversal standards provide for: ESRS 1 - reporting areas, due diligence obligations, value chain, reporting period, method of collection and presentation, and double materiality analysis; ESRS 2 - policies, measures, objectives, themes, reporting pillars. The ESRS 1 standard is based on the GRI rules, and the ESRS 2 on the TCFD rules. ESRS standards on ESG topics are presented in Fig. 1.

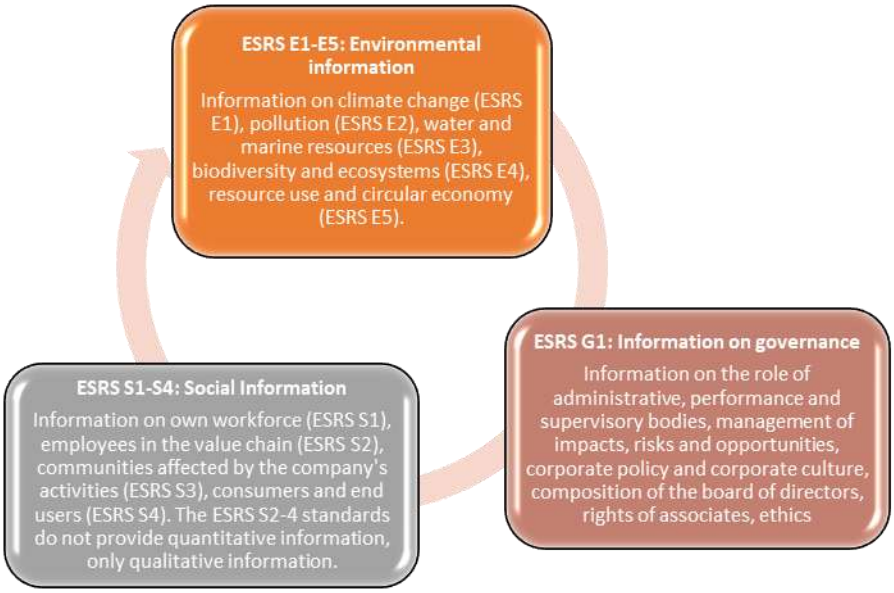

Fig.1. Structure of ESRS standards

Source: adapted from https://denkstatt.ro/prezentarea-pe-scurt-a-standardelor-europene-de-raportare-a-sustenabilatii-esrs/ [5].

The challenges of the ESG implementation process for company management

To achieve sustainability, organizations must make informed decisions, provide transparent reporting, and communicate a detailed plan for meeting their ESG goals. A sustainability strategy should consider social issues such as diversity, equity, inclusion, employee well-being, social responsibility, and supply chains, and CEOs should incorporate sustainability into business strategy and operational decisions and create key indicators and quantifiable performance measures to monitor and enforce sustainable practices.

A multitude of companies, including those from Romania, began implementing voluntary non-financial reporting as early as 2022, but there are currently over 700 companies that fall under the reporting conditions. The implementation experience has led to the identification of several challenges faced by the participating companies (Table 1).

Table 1. Challenges in the process of implementing ESG reporting

Author	The challenges are posed by:
Green Report Conference (CGR, 2023) [3]	Data Collection and Verification High costs Time and effort for communication. Reporting on employee statistics Data uniformity Reporting procedures Substantial investments in systems and technologies
ESG:ro Conference [2]	Lack of Comparability The lack of sector-level reporting. Lack of the necessary infrastructure for data collection
Stratos Company (2024) [32]	The Volume of Information and Figures Lack of experienced personnel in sustainability. The difficult language of standards and guidelines. The transposition of necessary measures into plans. The high costs of reporting (approximately 106,000 euros on average for large companies that need to report the entire value chain)
PWC (2023) [28]	The correlation between regulations and the creation of a sustainable business model
Green Start-Up (2024) [12]	Collection of prospective and retrospective data The application of double materiality (the impact on the company and the environment ("impact materiality"); how sustainability affects the company ("financial materiality"))
Eurofi (2022) [9]	Availability of data related to risks, greening, decarbonization The lack of quality data and transparency. The multitude of ESG data. (hundreds of indicators)
The CSRD compass [33]	The lack of expertise and resources. Alignment with other reporting standards The necessary changes in internal management processes

Source: own elaboration based on the studied literature.

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ESG reporting plays a crucial role in firm management.

Sustainability can create value and ensure long-term profitability, but this remains difficult as investors seek high returns on investment and customers demand low prices from suppliers. Of course, we can ask how this reporting helps companies. ESG experts highlight several opportunities for companies, including: enhancing the company's reputation and bolstering investor or bank confidence through the ESG rating; lowering the costs of mitigating the environmental impact of the company's investments; ensuring optimal management of environmental financial risks; venturing into emerging markets; and enhancing access to loans with preferential interest rates through transparency and data quality.

By including practices such as climate change impact assessment, workplace culture, and diversity, the ESG framework improves risk management decisions. The governance processes ensure that the management

(manager, board of directors, etc.) adapts to the reporting standards, thereby ensuring the company's effectiveness. On the other hand, the organizational culture's approach to risk assessment influences management decisions, which in turn align with the company's mission and values. To put it another way, all aspects of the unitary management process, including the business model, vision, mission, values, and strategy, must adhere to the ESG objectives.

This means taking action on mitigating greenhouse gas emissions; establishing viable supply chains; adapting to climate change; adopting circular economy models; water use; air and water pollution; waste management; biodiversity; conflicts of interest; business ethics; energy use; the relationship with the community; responsible partnerships; financial transparency; compensation of management and employees; health and safety at work; treatment of customers and suppliers; data protection; cyber security; employee experience and engagement; hiring and retaining employees, etc.

Firms that have specific environmental, social, and governance policies are better prepared to prevent and minimize potential problems that lead to penalties, reputational damage, and legal liabilities. Various authors have studied the relationship between risk management in companies and ESG performance.

The study of Maharani and Yonnedi [22] investigated the impact of risk management on ESG performance by considering governance components and company activities. The results show that risk management has a significant impact on financial performance and organizational value, and ESG plays a moderating role.

-The study of Zaporowska and Szczepański [35] sought to identify the role of ESG factors in operational risk management, with an emphasis on how ESG components are reflected in performance reporting as part of the management control function.

-According to Senadheera et al. [30], sustainability risk management and environmental risk management in the production process have the potential to significantly impact a company's financials. The same authors suggest that factors such as waste management, pollution levels, climate change, fossil fuel dependence, resource management, and carbon footprint can significantly impact long-term financial viability.

Based on a survey of over 500 firms, Mărcuță et al. [23] highlights that Romanian companies investing in social responsibility enhance their reputation, marketing, economic performance, adaptability, financing access, and sales.

In conclusion, any firm can use the ESRS as a framework to assess the sustainability of its business model and integrate ESG principles into management decisions. Management decisions can align with the standards by focusing on the following areas:

-We are strengthening the IT infrastructure (programs, technology, lower energy consumption, etc.);

-Retrofitting focuses on energy efficiency.

-Enhancing human resources policies and purchasing materials and products while considering environmental factors are key priorities.

-Marketing initiatives that encourage the adoption of ESG

-Elimination of fraud and corruption, etc.

We can measure the impact on the business using a multitude of quantitative (input consumption, gas emissions, workforce, etc.) and qualitative (work practices, codes of conduct, ethics, etc.) indicators. To have an impact, the company's business model must integrate ESG. Siao et al. [31] show, however, that there are too few empirical studies that concretely highlight this integration.

Non-financial sustainability reporting in the agri-food sector

Agriculture is a sector of the world economy that employs over a quarter of the world's population and has a significant impact on society in general and the environment in particular, as it uses a lot of pesticides, fertilizers, and other chemicals that can damage the earth, water, and air. The polarizing development of agriculture in certain regions also leads to negative social effects, such as the uprooting of populations, violations of labor regulations, and so on. Under these conditions, the organization of

activities in agriculture and the food industry according to ESG principles becomes a useful tool for evaluating how a company's actions would impact ethics and sustainability. ESG standards in agriculture assess the impact of an agricultural enterprise on the environment and society and include: an environmental component that involves energy use, waste management, and carbon emissions; a social component that takes into account how a company interacts with society (human rights, labor laws, community involvement, etc.); and a governance component that looks at the leadership and management of the company, taking into account things like manager pay, board composition, and shareholder rights.

These standards have emerged amid many issues arising from environmental concerns over the past decade. Due to imposed agro-environmental conditions, deforestation, soil erosion problems, climate change, and pollution from plastic packaging, society is faced with a contradiction between the processes related to the production of agricultural and food products and environmental aspects. Political measures for the implementation of sustainable development objectives (assumed by the UN 2030 Agenda from 2015), growing consumer preference for organic products, and geopolitical measures arising from commercial disputes have been added to these challenges. Political pressures have been exerted at the producer level to reduce fertilizer amounts, reduce water consumption, and eliminate certain raw materials from the composition, among other measures. For instance, the EU's decision to ban the use of palm oil affected the profits of the entire palm oil producer sector. Additionally, the geopolitical issues of recent years have demonstrated that agriculture has transformed into a powerful weapon due to the interdependence fostered by the promotion of globalization after the Second World War. This interdependence impacts all food sectors, resulting in increased consumer prices for essential goods or dumping prices that have the potential to bankrupt local businesses. Agriculture plays a vital role in achieving environmental goals, particularly in reducing biodiversity, meeting the food and textile needs of the population, sequestering carbon from soil and tree biomass, and reducing greenhouse gas emissions. These emissions include direct emissions from farms owned or controlled by farms (such as fertilizers and agricultural equipment), indirect emissions from energy consumption, and indirect emissions in the supply chain (such as transportation and packaging).

Producers and processors in the agri-food system have implemented current ESG reporting, which has led to a transfer of responsibility to farmers along the value chain. Economic agents downstream of agriculture impose restrictions on farmers in terms of pesticides, fertilizers, and so on, as well as new requirements in terms of quality and price. Under these conditions, it is normal for there to be a real reluctance of farmers to adopt sustainability criteria, especially when they involve investment in innovation and automation.

The EU Taxonomy (“EU Taxonomy for Sustainable Activities," Regulation 2020/852) [29] outlines the criteria for ecological sustainability in agriculture, such as reducing the impact of climate change, adapting to climate change, monitoring water resources, and protecting soil [17]. However, the taxonomy does not currently encompass all agricultural activities, including greenhouse crops, as it excludes agriculture from the adaptation annexes until the finalization of the current agricultural policy. The Farm2Fork strategy within the Green Deal, which imposes regulations such as agri-environmental measures, quality seeds, and emission reduction, does not fully integrate agriculture into non-financial reporting. However, the implementation of ESG measures in the supply chain has effects on farmers, even if they have not yet reported it.

The study of Mititean [25] looks at how European agriculture companies' corporate performance is affected by sustainability disclosure. Companies need to develop strategies for their environmental, social, and governance initiatives in light of the expanding global population and the new rules in Europe. According to the results, businesses with

higher ESG scores outperform their competitors, giving investors a better idea of which industry to invest in.

Hristova [17] gives the example of Fonterra (a New Zealand milk cooperative), which, through its carbon reduction objective, required dairy farmers and upstream suppliers to reduce on-farm emissions to maintain access to the market. Various changes brought to the agricultural sector by agribusiness companies that have implemented ESG are also presented, such as traceability technologies, short supply chains, food e-commerce, technological solutions to reduce waste from harvest to delivery to the consumer, images from satellite, automatic systems in the farm, measures to improve the management of productive areas, tracking the carbon footprint, etc.

With the implementation of ESG standards, large companies in the agricultural and food sectors have implemented various measures at the supplier level to meet the requirements, such as ensuring product certification (Mega Image), promoting regenerative agriculture (Nestlé), collecting data on GHG emissions (Cargill), management software that allows automatic data collection (GHG, carbon footprint), etc. Moreover, agriculture can implement measures such as increasing the use of renewable energy, reducing energy consumption, decreasing food waste, reducing packaging pollution, reducing water consumption, and conserving biodiversity. In May 2024, the European Council postponed by two years the mandatory reporting in the agri-food sector. However, the possibility of farmers being required to report directly within the CSRD (even with partial data) in the next decade necessitates the integration of data collection into farm management processes such as agricultural stock management and input consumption.

Indicators used for ESG evaluation in the management process

When classifying indicators to meet ESG objectives, we identify several practical assessment methods, including those suggested by rating firms, specialized scientific papers, and European Commission standards.

The rating firms until now have used their systems to create aggregate indicators that included metrics such as: water used, energy, biodiversity, product innovation, carbon emissions, carbon footprint, land use, raw material supply, packaging materials, fuel consumption, recycling, resource efficiency, etc. (rating firms such as Refinitiv, Global ESG, Bloomberg, and MSCI). Veenstra and Ellemers [34] quantified 130 ESG scoring agencies using 237 unique indicators and over 600 corporate ESG indicators. Despite the abundance of indicators, they assert that an effective assessment of the integration of ESG objectives into the business model or its progress remains unattainable. Different rating companies communicate how to integrate ESG objectives into the corporate strategy through their sustainability scores, but Erokhina [8] asserts that these scores fail to demonstrate the cause-and-effect link. Moreover, sustainability reports based on ESG standards, be they ESRS, GRI, or SASB, manage to outline strategic directions but do not present quantifiable indicators of impact. All companies apply the general conditions universally, but they only consider the environmental, social, and governance criteria and their components as "material," meaning they are relevant to the specific type and operations of the company. However, we must understand that at the level of corporations, ESG reporting includes hundreds of indicators, many of which are not adaptable or commensurable to small and medium-sized companies.

Under these conditions, several scientific works have accounted for a series of key environmental, social, and governance performance indicators to analyze the performance of companies, referring to the scores given by different rating companies. For example, Gebhardt et al. [11] analyzed the effects of implementing key performance indicators (KPIs) within the internal management system on ESG performance. The study found a positive relationship between indicators, total ESG performance, and social performance, but with no conclusive results on the environmental and governance dimensions; Zhu et al. [36] analyzed the performance of

Chinese companies using 10 ESG indices adapted to different investment strategies; and Junius et al. [18] studied the impact of ESG performance on firm performance and market value across 271 companies. They studied the statistical relationship between the ESG score and 3 performance indicators (return on assets, return on equity, and Tobin's Q). Various criteria, including relevance, practicality, value for the end user, measurement method, representativeness, availability, etc., must be considered when selecting indicators, according to specialized works [21]. Another crucial factor is the unit of expression, as some indicators, like environmental goods, quality, and biodiversity, are challenging to measure. The selection of indicators must also consider the company's sector. In agriculture, such indicators, measured and combined within sustainability assessment tools, can reflect short- and long-term farm resilience as well as the ability to cope with market shocks [4].

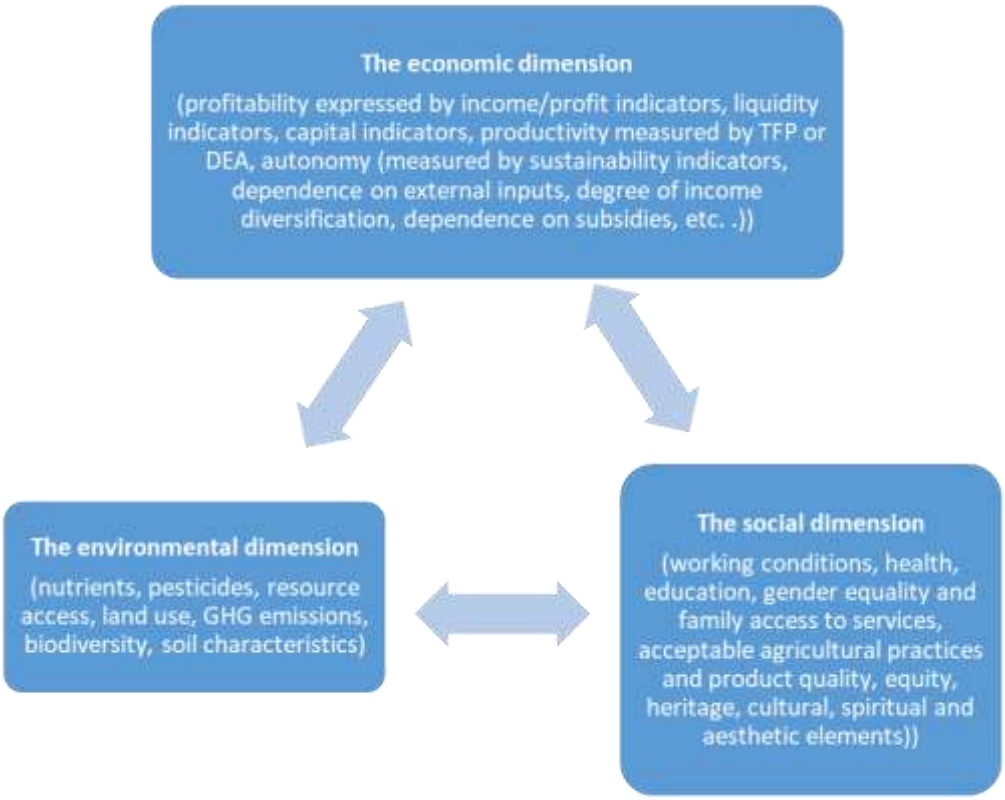

Fig. 2. Recommended indicators in sustainability assessment
Source: adapted from Latruffe et al. [20].

Existing techniques for monitoring agricultural sustainability often rely on measurement indicators that may not always be easily accessible, even when they assess these indicators separately (by weighting) or create a composite index [10]. Despite clearly established criteria for selecting indicators within the created models, significant constraints often arise in their construction due to their unavailability or limited commensuration capacity [21]. The indicators must provide a clear picture of the three dimensions of sustainability. For example, according to Latruffe et al. [20], the indicators used to measure sustainability at the farm level are presented in Figure 2.

The following elements are also important in agriculture:

-The characteristics of the indicators (whether utilized in financial or non-financial reporting). For instance, Hoinaru et al. [15] compared the requirements of the international accounting standard IAS 41-AAgriculture ("the accounting treatment and presentation of

information on agricultural activities") and the GRI standard 13-AAgriculture, Aquaculture, and Fisheries. They showed that these standards are different but also work well together. The authors state that the GRI standard provides information on soil quality, ecosystem conservation, adaptation to climate change, food security, etc., while the IAS standard provides information on farm economics and agricultural environmental accounting that contribute to business sustainability.

-The sustainable development indicators used can be categorized according to the RISE method (54 indicators with scores from 1 to 100 classified into 10 categories), the Position Green software's method, other platforms for generating sustainability reports, or specific standards [24].

CONCLUSIONS

Integrating ESG standards into agricultural management presents both challenges and opportunities. The purpose of the CSRD and ESRS frameworks is to standardize sustainability reporting by giving businesses an organized way to reveal the effects they have on the environment, society, and government. However, there are some challenges in putting these standards into practice, such as the high expense of data collection and reporting, the intricacy of ESG factors, and the requirement for sector-specific modifications.

The issues mentioned by businesses included inconsistent data, a lack of industry-specific guidelines, and technical difficulties in adhering to reporting standards. Notwithstanding these difficulties, ESG reporting can boost a business's standing, enhance risk control, and provide new business prospects. Enhancing IT infrastructure, funding employee training, and implementing technologies for improved data management are necessary for a successful deployment.

To make adoption easier, future research should concentrate on improving ESG indicators and investigating industry-specific reporting requirements. Overall, despite its many challenges, the agricultural industry's transition to comprehensive ESG reporting has the potential to advance sustainability objectives and strengthen long-term economic resilience.

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