Sustainability reporting and assurance practices in agribusiness: a comparative institutional analysis of Ukraine and Germany

Volodymyr Metelytsia*
ORCID: https://orcid.org/0000-0002-0795-0215
Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Germany
State Tax University, Ukraine

Volodymyr Kraievskyi
ORCID: https://orcid.org/0000-0003-3513-3666
State Tax University, Ukraine

Serhii Taran
ORCID: https://orcid.org/0009-0006-7880-5070
Interregional Academy of Personnel Management, Ukraine

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Purpose. *The aim of the study is to assess the institutionalisation of sustainability reporting and assurance practices in the agricultural sectors of Ukraine and Germany through the conceptual lenses of legitimacy, institutionalisation, and political economy, and to determine the opportunities for their harmonisation with international and European standards, particularly the Corporate Sustainability Reporting Directive (CSRD), European Sustainability Reporting Standards (ESRS), and International Standard on Sustainability Assurance (ISSA) 5000.*

Methodology. *The methodological basis of the research is a comparative analysis of non-financial reporting by 14 agro-industrial enterprises in Ukraine and Germany. The study relies on the analysis of corporate reports, the legal framework of the EU and Ukraine, as well as international assurance standards, specifically ISAE 3000 and ISSA 5000. The study employs qualitative methods, including content analysis of reports, case studies, institutional and regulatory analysis.*

Results. *The results show that Ukrainian agro-industrial enterprises demonstrate a low level of integration of the double materiality principle in sustainability reporting, limited coverage of non-financial indicators, and high risks of greenwashing due to the absence of independent data verification. Only a few companies have switched to CSRD reporting with a double materiality*

*Corresponding author: metelytsia@iamo.de

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assessment procedure. In contrast, German companies have already adapted their reporting systems to CSRD and ESRS, ensuring greater transparency and audit verification. The study identifies structural preconditions for transitioning to independent assurance in Ukraine: harmonisation of corporate and state reporting, alignment with ISAE 3000/ISSA 5000 requirements, enhancement of staff competencies, and institutionalisation of ESG (Environmental, Social, Governance) committees.

Originality. *This is the first systematic empirical comparison of sustainability reporting and assurance practices in the agro-industrial sectors of Ukraine and Germany, identifying a structural disconnect between corporate ESG disclosures and state reporting forms, and proposing a hybrid adaptive model for transitioning to reasonable assurance auditing under wartime conditions – a context absent from existing literature.*

Practical implications. *The findings provide actionable guidance for Ukrainian enterprises on embedding double materiality and strengthening internal ESG data controls, as well as for auditors on shifting toward evidence-based assurance under ISAE 3000 and ISSA 5000. This, in turn, reduces greenwashing risks and enhances reporting credibility for international investors.*

Key words: *sustainability reporting, green finance, audit, comparative analysis, greenwashing, transparency, impact materiality, financial materiality, institutionalisation, pragmatism.*

JEL-Classification: *M41, Q01, Q14, Q51*

1. INTRODUCTION

Following the onset of the full-scale Russian invasion of Ukraine, the recovery and reconstruction of the national economy have acquired critical strategic importance. Domestic budgetary, financial, and material resources are clearly insufficient to ensure large-scale reconstruction and integration into the European economic space. For this reason, mobilising external sources of financing – primarily international investments, grant programs, and credit lines – has become a critical condition [1; 2]. In this context, non-financial reporting, now transformed into the concept of "sustainability reporting," is no longer just a communication tool between business and society but one of the key mechanisms for attracting capital. A high level of transparency, reliability, and comparability of corporate reporting serves as a prerequisite for the trust of investors and international financial organisations, which increasingly orient their strategies toward ESG (Environmental, Social, Governance) principles and the UN Sustainable Development Goals [3].

At the same time, the formation of a sustainability reporting system in Ukraine takes place under conditions of both transformational and wartime pressure. While in EU countries, including Germany, the evolution of non-financial reporting has progressed from Directive 2014/95/EU to the adoption of the Corporate Sustainability Reporting Directive (CSRD) and the implementation of the European Sustainability Reporting Standards (ESRS), in Ukraine this field remains at an early stage [4; 5]. In 2024, the government approved the Strategy for the introduction of sustainability reporting by enterprises, which for the first time established regulatory requirements for harmonisation with European standards [6].

Moreover, sustainability reporting by Ukraine's agro-industrial enterprises is largely declarative and often limited to "self-reporting" without external verification, with only a few exceptions. This approach creates conditions for data distortion or even deliberate falsification aimed at attracting investor attention or improving corporate

image. In an environment marked by high levels of non-transparency and corruption, this poses a particular threat to the trust of both domestic and external stakeholders [7]. For this reason, the role of independent auditing becomes crucial: by applying the International Standard on Assurance Engagements (ISAE) 3000 [8] and the International Standard on Sustainability Assurance (ISSA) 5000 [9], auditors confirm the accuracy and reliability of non-financial indicators, allowing their credibility to be equated with financial reporting. Such an approach minimises the risks of manipulation, increases transparency, and creates the foundation for building trust in Ukrainian companies on the part of both civil society and international institutional investors [10].

Particular attention should be paid to the methodology of auditing. In international practice, verifying the reliability of non-financial indicators involves not only checking their compliance with general criteria or the absence of material misstatement but also conducting substantive testing of primary source documents and inventory records [11; 12]. For Ukrainian companies in general, and agro-industrial companies in particular, this requires granting direct auditor access to production processes, enabling independent observations, control measurements, and verification of documentary evidence chains – from energy balances to raw material write-off records and waste generation reports. Only under such comprehensive verification can it be guaranteed that published indicators correspond to actual data and are not the result of distortions or deliberate manipulation. In this context, the role of the auditor goes beyond formal confirmation: the auditor becomes a guarantor of reporting integrity, capable of restoring trust in business from both Ukrainian society and international partners and investors [10; 13].

A comparison of Ukrainian and German experience is particularly illustrative in the agricultural sector. Germany has well-established practices of non-financial reporting shaped by the CSR-Richtlinie-Umsetzungsgesetz (CSR-RUG) of 2017 and the Supply Chain Due Diligence Act (Lieferkettensorgfaltspflichtengesetz, LkSG) [14; 15]. In addition, the Federal Climate Change Act (Klimaschutzgesetz) introduced ambitious targets for emission reduction and climate neutrality, directly influencing corporate reporting standards [16; 17]. As a result, German companies already apply the principle of double materiality and ensure reporting audits in the form of reasonable assurance in line with the requirements of ISAE 3000 and the forthcoming ISSA 5000 [8; 9; 18].

In Ukraine, sustainability reporting remains largely declarative and often limited to voluntary "self-reporting." Although companies such as Kernel Holding S.A., Astarta Holding PLC, and MHP SE publish integrated reports with GRI elements, their compliance with CSRD and ESRS standards remains incomplete (Kernel Holding [19]; Astarta Holding [20]; MHP SE [21]). The absence of full auditing of non-financial information exacerbates greenwashing risks, thereby creating a barrier that complicates the integration of Ukrainian agricultural enterprises into the European capital market [7]. Therefore, the development of sustainability reporting audits is considered a key condition for building investor trust and achieving

alignment with European practice [10].

The study holds scientific value to the development of accounting and auditing practices in Ukraine. A review of recent publications shows that most existing studies focus on mature economies, such as the EU countries or the United States, where institutional frameworks are long established and auditing of non-financial reporting is widespread [11; 13; 22]. By contrast, the case of Ukraine, which is navigating wartime challenges while integrating into the European market, remains underexplored. In particular, unresolved questions include how companies combine state statistical, tax and environmental reporting with corporate non-financial metrics; how auditing practices can be adapted to a crisis economy under such conditions; and what institutional innovations are required to achieve compatibility with the CSRD, ESRS, and ISSA 5000 requirements.

Despite growing scholarly attention to sustainability reporting in the EU, the literature lacks comparative empirical evidence from countries simultaneously undergoing institutional transformation and wartime pressure. Most existing studies focus on mature economies where regulatory frameworks are well established, leaving unresolved how companies adapt reporting and assurance practices under crisis conditions while pursuing European integration.

The aim of this study is to address this gap through a comparative analysis of sustainability reporting and assurance practices in the agricultural sectors of Ukraine and Germany, contributing to academic understanding of the transformation of sustainability reporting in a crisis economy and providing practical guidance for Ukrainian enterprises, investors, and regulators in the process of post-war recovery.

The research pursues two interrelated objectives. First, it assesses and compares the current state of sustainability reporting and assurance practices in the agro-industrial sectors of Ukraine and Germany, identifying key differences in regulatory frameworks, disclosure standards, and audit maturity. Second, it develops practical recommendations for improving the sustainability reporting and audit system in Ukraine, taking into account European experience and the specific conditions of a wartime economy.

2. LITERATURE REVIEW

2.1. Regulatory and institutional framework

For this study, several types of sources were used, including EU sustainability reporting standards, which made it possible to review approaches to report construction; regulatory documents on sustainability reporting in Germany and Ukraine; and academic literature addressing sustainability reporting in Europe.

The analysis of sustainability reporting standards shows that both early and contemporary approaches to sustainability reporting were formed around voluntary disclosures, which provided a framework for transparency but did not guarantee unified comparability of indicators. In particular, the practice-oriented analysis by Ballou et al. demonstrates that the diversity of voluntary disclosures complicates investor interpretation even when companies declare a high level of openness [13]. In this

context, the normative sources of the GRI detail universal and sector-specific standards as an instrument for reducing information asymmetry [23], yet the voluntary nature of their application for a long time preserved the fragmentation of practices.

A significant shift toward investor-oriented standardisation is associated with the institutional consolidation of the SASB within the IFRS Foundation and the establishment of the ISSB [24; 25]. The publication of IFRS S1 and IFRS S2 formalised the intention to integrate non-financial risks into the logic of financial reporting and to ensure global comparability, building on climate-related approaches [26; 27]. At the same time, the existing literature leaves unresolved the issue of the practical compatibility of different standard-setting philosophies: in particular, GRI is oriented toward a broader range of stakeholders, whereas ISSB/IFRS focuses on investors. This divergence creates methodological tension regarding the choice of metrics, reporting boundaries, and materiality, which directly affects the comparability of data across companies and sectors, even under conditions of formal "convergence" of standards [23; 27; 28].

An additional dimension is represented by integrated reporting, which seeks to combine financial and non-financial data into a single value creation model [29; 30]. However, at the level of operationalisation – namely, how to align integrated narratives with the metric requirements of ESRS/IFRS – the literature lacks consistent solutions, which limits reproducibility and empirical verifiability in applied research.

The regulatory framework and the logic of the EU's move towards standardised disclosures are conceptualised by C. A. Adams [29] and C. De Villiers and W. Maroun [31], who critically highlight that integrated/sustainable reporting is often driven not only by investor needs but also by institutional pressures and expectations of legitimacy. Theoretical perspectives on organisational legitimacy and institutional pressures [32–35] further explain how companies, in response to regulation, may reproduce the required reporting formats without ensuring the substantive quality of the indicators.

The analysis of EU and German regulatory acts shows that the EU regulatory logic reflects a gradual tightening of requirements: from the introduction of a minimum obligation to disclose non-financial information [4] to a detailed CSRD/ESRS system based on the principle of double materiality and mandatory external assurance [5; 28]. For Germany, the key transposition event was the implementation of the NFRD through the CSR-RUG [14], which established a mandatory reporting obligation while preserving discretion in the choice of reporting standards. According to recent studies, this arrangement contributed to the continued fragmentation of practices and undermined comparability [10; 18].

Further initiatives – the European Green Deal [36] and national climate laws [17; 37] – strengthened the role of climate risks in reporting. At the same time, the EU Taxonomy [38] and the German Sustainable Finance Strategy [39; 16] stimulated the standardisation of environmental KPIs. The "Fit for 55" package [40] increased the importance of emissions monitoring, but did not eliminate methodological heterogeneity until CSRD/ESRS established a unified disclosure

framework [5; 28; 41].

At the same time, even with the adoption of ESRS, the literature records a transition period and the coexistence of frameworks, which results in the "hybridisation" of practices. Existing studies indicate the risk of only partial comparability, as companies interpret materiality, value chain boundaries, and measurement methods differently [10; 18; 42].

The analysis of the regulatory framework for assurance shows that classical approaches to the assurance of non-financial information are associated with ISAE 3000, which distinguishes between limited assurance and reasonable assurance [8]. G. Manetti and L. Becatti show that limited assurance is widespread due to its lower resource intensity [11], while Simnett argues that reasonable assurance provides higher reliability due to deeper testing of controls and data [12]. At the same time, A. Kolk and P. Perego demonstrate the dependence of the chosen level of assurance on regulatory requirements and stakeholder expectations [22].

A critical aspect is that the growth of regulatory and investor expectations makes limited assurance vulnerable to criticism as insufficient to prevent greenwashing risks and non-financial misstatements [43]. The adoption of the ISSA 5000 represents an attempt to reduce methodological uncertainty by creating a specialised standard for sustainability assurance that is compatible with different reporting frameworks [9]. Conversely, the AA1000AS framework offers an alternative assurance logic embedded in stakeholder accountability and the core principles of inclusivity, materiality, and responsiveness [44]. Nevertheless, the literature retains a contradiction: on the one hand, CSRD implies a movement toward reasonable assurance; on the other hand, practical tools and sector-specific audit protocols (especially for complex value chains and Scope 3) are unevenly developed, and some measurement approaches rely on technical guidelines [45; 46] that are not always directly translatable into audit procedures.

In Ukraine, the regulatory framework for sustainability reporting is at an early stage. While the 2024 government strategy on sustainability reporting marked the first formal step toward CSRD/ESRS harmonisation [6], implementation mechanisms remain undefined. Ukrainian agro-industrial enterprises are subject to mandatory state statistical, tax, and environmental reporting forms (No. 1-PV, No. 1-Waste, No. 2-TP), yet these are disconnected from international ESG metrics, creating a structural gap between corporate sustainability disclosures and state data systems.

2.2. Critical review of academic literature

The European regulatory context, including the German specifics, is summarised by K. Hummel and D. Jobst [47], as well as J. Ruohonen and H. Kullas [10], showing that the tightening of requirements inevitably shifts the focus towards data verification and the role of auditors. The debatability of mandatory verification and its consequences for the audit market is emphasised by P. Velte and M. Stawinoga [18]. It is the assurance dimension that is revealed in J. H. Casey and J. H. Grenier [43], R. Simnett [12], A. Kolk and P. Perego [22], G. Manetti and L. Becatti [11], as well as B. Ballou et al. [13], where the risk of formalising procedures is critically traced: the

presence of an assurance statement does not automatically equate to high-quality disclosure. In parallel, J. R. Kurpierz and K. Smith [7] conceptualise greenwashing as a "triangle" of distortions, and G. Pigatto et al. [48] demonstrate the limits of voluntary approaches and lessons for integrated reporting. The technological and risk-based vector is updated by C. Olsen [49] and D. Schneider et al. [46], emphasising that standardisation reinforces the need for digital data loops and for the disclosure of transitional risks.

For Ukraine, the literature identifies a dual pressure: the need to converge with the EU regulatory model and, at the same time, the necessity to adapt reporting to the conditions of a wartime economy. Macroeconomic reviews emphasise the strategic role of the agricultural sector and specific constraints related to mobilisation, migration, and losses of resources and infrastructure [50]. European initiatives on green transformation and green recovery form the framework for future requirements [2; 36; 51], while the Ukraine Facility links integration, digitalisation, and the green transition with access to financial resources [1; 52; 53].

At the national level, institutional steps – such as the strategy for the introduction of sustainability reporting by enterprises [6] and legislative initiatives on accounting and auditing [54] – outline a movement toward a CSRD/ESRS-type logic. The analysis of Ukrainian academic literature shows that a number of researchers describe the emergence of modified formats (ESGI/ESGI-reporting), in which sustainability is combined with the investment needs of reconstruction [55; 56]. V. Metelytsia substantiates the feasibility of using sustainability reporting as a tool for attracting investment for the green reconstruction of agribusiness, emphasising the disclosure of environmental, social, and governance aspects of corporate activity [55]. At the same time, V. Vorobey highlights the institutional role of ESG approaches in linking sustainability objectives with reconstruction investment priorities, although these sources remain largely strategic and declarative and require further operationalisation at the level of corporate reporting [56]. Practical materials from the audit market also emphasise the link between independent assurance and access to capital as well as the management of reputational risks [57; 58].

A critical analysis of the sources reveals three key contradictions that form the basis for further research:

- The contradiction of standard convergence: formal convergence of standards (GRI–ISSB/IFRS–ESRS) does not fully eliminate methodological heterogeneity in metrics, materiality, and reporting boundaries, which limits comparability and verifiability of data [23; 26–28; 59];
- The contradiction between regulatory unification and practical hybridity: even under CSRD/ESRS, companies in the transition period maintain multi-standard practices, which complicates quality control and auditing [10; 18; 42; 60];
- The contradiction between rising requirements and audit readiness: expectations of a shift toward reasonable assurance face uneven maturity of internal control systems and methodological procedures in sustainability assurance, despite the emergence of ISSA 5000 [8; 9; 43; 61];

These contradictions give rise to the following research questions (RQ) that guide the present study:

RQ1: To what extent do sustainability reporting and assurance practices in Ukraine's agro-industrial sector align with CSRD/ESRS requirements, and how do they differ from German practices?

RQ2: What institutional and methodological conditions are necessary for Ukrainian agro-industrial enterprises to transition toward reasonable assurance auditing compatible with European standards?

3. METHODOLOGY

3.1. Research design

This study employs a qualitative comparative research design to examine sustainability reporting and assurance practices in the agro-industrial sectors of Ukraine and Germany. The comparative logic is grounded in the selection of two jurisdictions with contrasting levels of regulatory maturity: Germany represents a benchmark EU economy with an established CSRD/ESRS framework, while Ukraine represents a transitional economy simultaneously pursuing European integration under wartime conditions. This contrast enables the identification of institutional and methodological gaps relevant to RQ1 and RQ2.

Three theoretical frameworks structure the analytical interpretation of this study. Legitimacy theory [33] posits that organisations seek to align their behaviour with societal expectations in order to maintain a "social licence" to operate. In the agricultural context, this is particularly salient: agro-industrial enterprises manage land, water, and biological resources that are inherently public goods, making their social licence contingent not only on financial performance but on demonstrable environmental stewardship. Under wartime conditions, this dynamic is further complicated – Ukrainian agribusinesses must simultaneously maintain domestic legitimacy (through tax contributions, social investments, and military support) and external legitimacy (through ESG disclosures aligned with EU investor expectations). Institutional theory [34] distinguishes three mechanisms through which organisations adopt practices: coercive isomorphism (regulatory mandates), normative isomorphism (professional and industry norms), and mimetic isomorphism (imitation of successful peers). For Ukrainian agro-industrial enterprises, coercive pressure derives from EU integration requirements and investor expectations; normative pressure from CSRD/ESRS standards and audit profession norms; and mimetic pressure from the reporting practices of leading European agribusinesses. Crucially, institutional theory also distinguishes between normative institutionalisation – where practices are internalised as legitimate and appropriate – and cognitive institutionalisation – where practices become taken-for-granted assumptions. In the Ukrainian agribusiness context, sustainability reporting remains at the normative stage at best: companies adopt ESG formats because they are expected to, not because they are embedded in organisational routines or data systems. The political economy of accounting [58] interprets reporting as an instrument of power and resource allocation rather than a

neutral disclosure mechanism. For a Ukrainian agro-holding operating under martial law, this means that sustainability reporting is not merely a compliance exercise but a geopolitical signal: publishing CSRD-aligned data communicates readiness for EU capital market integration, access to Ukraine Facility funds, and alignment with reconstruction investment priorities – linking corporate disclosure directly to macroeconomic and political outcomes.

3.2. Sample and data collection

The empirical basis of the study comprises sustainability reports of 14 agro-industrial enterprises – 7 German and 7 Ukrainian – covering the period 2022–2025. German companies were selected based on turnover, number of employees, and sectoral diversity within the agri-food complex, ensuring representation of different reporting formats and assurance practices under CSRD/ESRS. Ukrainian companies were selected based on land bank size and public availability of non-financial reports, as the majority of Ukrainian agribusinesses do not publish sustainability reports at all. This selection is based on predefined criteria and does not claim to be statistically representative; rather, it reflects the maximum feasible empirical scope given the near-absence of structured sustainability reporting in Ukrainian agribusiness. The qualitative comparative design is appropriate for this research stage, where the primary objective is to map institutional and methodological gaps rather than to generate generalisable quantitative findings. The sample intentionally captures the full spectrum of current reporting maturity – from advanced CSRD-aligned disclosures (Astarta Holding PLC) to purely declarative CSR publications (Continental Farmers Group) – enabling analytical depth rather than breadth. The findings should be interpreted accordingly, and future research may extend this work through larger-scale quantitative analysis as reporting practices mature.

In addition to corporate reports, the following sources were analysed: academic literature [10; 13; 18; 32; 34; 47; 58], EU directives and ESRS [4; 5; 28; 59], international auditing standards ISAE 3000 and ISSA 5000 [8; 9], and German and Ukrainian legislative acts [6; 14; 17; 36; 54].

3.3. Methods

Five methods were applied in a sequential analytical framework, as summarised in Table 1. Regulatory analysis examined the legal foundations of sustainability reporting in the EU and Ukraine, including Directive 2014/95/EU, CSRD, CSR-RUG, Fit for 55, and related acts [4; 5; 14; 39], identifying regulatory gaps and compliance requirements.

Content analysis of the 14 corporate reports systematised disclosure practices across environmental, social, and governance dimensions using a structured assessment framework. Each company was evaluated against five criteria: (1) reporting standard applied (GRI, ESRS, CSRD, or other); (2) application of the double materiality principle (full, partial, or absent); (3) coverage of quantitative ESG metrics in physical and financial units; (4) level of independent assurance (reasonable, limited, partial, or none); and (5) alignment between corporate ESG disclosures and mandatory state reporting forms applicable in Ukraine. This framework enabled systematic cross-

country comparability and is reflected in Tables 3–5 of the Results section.

Table 1

Methods of analysing sustainability reporting and its audit in Ukraine and Germany

Section / Task	Purpose of analysis	Methods
Review of reporting development in Germany	identify the degree of CSRD/ESRS integration into company practices	regulatory analysis, content analysis of non-financial reports
Review of reporting development in Ukraine	assess the compliance of corporate practices with national and European regulation	document analysis, comparative analysis
Analysis of auditing in Germany	examine the practice of independent reporting assurance (limited / reasonable assurance)	critical literature review, regulatory analysis
Analysis of auditing in Ukraine	determine the state and challenges of sustainability reporting audit in large agricultural companies	case study, content analysis
Development of policy recommendations	outline directions for improving sustainability reporting audit in Ukraine	comparative-analytical synthesis

Source: developed by the authors.

Critical literature review [10; 13; 18; 32; 34; 47] provided the theoretical grounding for interpreting assurance practices and institutional responses to regulatory pressure. Case study analysis was applied specifically to three Ukrainian companies – Kernel Holding S.A., Astarta Holding PLC, and Continental Farmers Group – to assess audit readiness and alignment with CSRD/ESRS in depth. Comparative-analytical synthesis integrated findings across both countries to develop a conceptual framework for improving sustainability reporting and audit practices in Ukraine.

4. RESULTS

4.1. Sustainability reporting systems in Germany and Ukraine: a structural comparison

Before presenting the comparative findings, it is necessary to clarify the concept of double materiality as operationalised in this study, since the term – though central to CSRD and ESRS – remains relatively new in Ukrainian academic and corporate practice. Double materiality, as defined under CSRD and elaborated in ESRS 1, comprises two interdependent dimensions. Impact materiality concerns the company's effects on the external world: how its operations affect the environment, people, and society – for example, greenhouse gas emissions from crop production, land degradation, water extraction, or labour conditions in agricultural supply chains. Financial materiality, by contrast, concerns the reverse direction: how sustainability-related developments affect the company's financial position, performance, and cash flows – for example, how climate-related droughts increase input costs, how regulatory carbon pricing affects margins, or how reputational risks from greenwashing translate into loss of investor confidence. A topic is considered doubly material when it is material from both perspectives simultaneously. The significance of this distinction for

the agricultural sector is particularly pronounced: land use, water, and climate are simultaneously the sector's primary production inputs and its most significant externalities, making double materiality not a formal compliance requirement but a structural feature of agribusiness risk and impact. Ukrainian companies that currently apply only impact materiality – or neither dimension – therefore disclose an incomplete picture both for investors and for society.

Germany's transition from voluntary to mandatory sustainability reporting represents one of the most instructive regulatory trajectories within the EU. Following the transposition of the NFRD through CSR-RUG in 2017, German companies progressively moved toward a unified framework built on CSRD and ESRS, culminating in mandatory external assurance – initially limited, with a transition to reasonable assurance by 2028. Across European companies, limited assurance currently dominates: 80% of audits apply limited assurance only, while 20% combine both levels [44]. Assurance services remain heavily concentrated among the Big Four firms, which accounted for 83% of audits in the study sample [44], reflecting both market maturity and the resource-intensive nature of sustainability assurance.

For Ukraine, the German trajectory serves as a structural benchmark. However, a critical asymmetry exists: whereas Germany underwent gradual institutional transformation over more than a decade, Ukrainian agro-industrial enterprises face the need to reach reasonable assurance readiness by 2028 without an established methodological or regulatory infrastructure. This compression of the reform timeline – under wartime conditions – defines the core challenge addressed in this study. A systematic comparison of the two countries' sustainability reporting and auditing systems is presented in Table 2.

Table 2

Comparison of sustainability reporting and auditing systems of agricultural enterprises in Germany and Ukraine

Criterion	Germany	Ukraine
1	2	3
Initial stage of regulation 2017–2021	Implementation of NFRD through CSR-RUG (2017); non-financial reporting for companies with ≥500 employees; no unified audit format	Mandatory statistical, tax, and environmental reports for agro-industrial enterprises within state regulation, without independent audit (except for inspections by the Tax Service, State Labour Service, and environmental authorities)
Transition to modern standards 2022–2024	Introduction of CSRD (2022), implementation in 2025 through CSRD-Umsetzungsgesetz; adoption of ESRS and mandatory auditing (initially limited assurance, with transition to reasonable assurance)	Cabinet of Ministers Resolution (2024) on the introduction of sustainability reporting and ESRS adaptation; auditing only initiated at the state level, implementation mechanisms insufficiently specified
Levels of assurance 2025	Limited assurance (2025–2028), after 2028 – mandatory reasonable assurance	Immediate need to target reasonable assurance by 2028 for synchronisation with the EU

Continuation of Table 2

1	2	3
Methodological basis	Use of ESRS, EU Taxonomy, national laws; combined with global standards (GRI, ISSB)	Initial stage of developing concepts and methodological guidelines; no national standards for sustainability reporting audit
Role of auditors	High involvement of leading audit firms; development of practices for verifying non-financial indicators	Only isolated initiatives by audit firms; no systemic practice of sustainability auditing
Context	Stable economy, gradual integration of EU regulations	Transitional economy, wartime context, need for rapid adaptation and development of a national model of sustainability, auditing, and investment attraction

Source: systematised by the authors based on sources [4–6; 14; 17; 36; 38; 39; 54].

It can be expected that, in the long term, adapting Germany's experience will enable Ukraine not only to meet the regulatory requirements of the European Union but also to strengthen its own investment attractiveness. Expanded auditing of sustainability reporting will ensure a higher level of transparency, protection against reputational risks, and build trust among institutional investors. This is particularly important during the period of wartime recovery and Ukraine's integration trajectory into the European market, where requirements for data reliability and independent verification are essential.

4.2. Features of sustainability reporting audits of German agro-industrial companies

Large German agro-industrial companies systematically report on their sustainability activities, combining international voluntary frameworks with European regulatory standards [62]. During 2022–2023, the most common frameworks remained GRI, TCFD, and CDP. By 2024–2025, most companies in the sample had published their first reports in accordance with CSRD/ESRS, based on the principle of double materiality – disclosing both the company's impacts on the environment and society, and the impacts of sustainability factors on the company itself. The key material topics identified across the sample were climate change (ESRS E1), employee rights and well-being (ESRS S1), and business ethics (ESRS G1).

The analysis showed that most of the companies reviewed had already published their first reports for 2024 in 2025 in accordance with CSRD/ESRS standards, which are based on the principle of double materiality. This approach combined disclosure of the company's impacts on the environment and society with assessment of the impacts of sustainability factors on the company itself. In these reports, the key double materiality topics were identified as climate change (ESRS E1), the rights and well-being of employees (ESRS S1), and business ethics (ESRS G1).

Table 3 presents examples of sustainability reporting practices of seven leading German agro-industrial companies, showing different approaches to applying international and European standards, as well as different formats of independent assurance. As shown in Table 3, a total of 5 out of 7 companies (71.4%) obtained limited assurance, one company had no independent assurance, and in one case non-

financial data verification was partially integrated into the financial audit. This structure confirms the "transitional" nature of 2024–2025: companies have already adapted to ESRS/CSRD requirements, but a widespread shift to reasonable assurance has not yet taken place.

Table 3

Sustainability reporting and audit practices of the largest German agro-industrial companies

Company (sector)	Turnover (2024), bn EUR	Employees, persons (approx.)	Sustainability report format	Main components	Audit / verification
Südzucker AG (food industry, sugar, bio-products)	9.5	18,000	Sustainability Statement (PDF, ESRS)	ESG data, climate risks, energy, social indicators, governance	Verified (limited assurance)
Dr. August Oetker Nahrungsmittel KG (food industry)	4.0	17,000	Sustainability Report 2023/2024 (PDF, GRI)	Economy, environment, social responsibility, supply chain	Partially verified (GRI external check, limited)
Symrise AG (aroma and food ingredients)	5.0	13,000	Corporate Report 2024: Non-financial Group Report (PDF/online)	Double materiality, ESG indicators, strategies, risks	Auditor-verified (limited assurance)
KWS SAAT SE & Co. KGaA (seeds, agribusiness)	2.0	5,500	Sustainability section in Annual Report 2023/2024 (online + PDF)	Non-financial declaration, ESG data, goals	Partially verified (financial reporting only)
BayWa AG (agribusiness, trading, agri-technology, energy)	21.1	24,000	Sustainability Report 2024 (PDF, non-financial declaration HGB)	ESG strategy, climate targets, resources, social sphere	Auditor-verified (limited assurance)
HelloFresh SE (meal-kit, food e-commerce)	7.6	20,000	Non-financial Report 2024 (PDF, ESRS/CSRD)	ESG factors, supply chain, environmental impact	Verified (limited assurance)
DMK Group (Deutsches Milchkontor eG) (dairy cooperative)	5.6	7,500	Responsibility Report 2024 (PDF)	Sustainable production practices, livestock, social issues	No independent audit (self-reported)

Source: systematised by the authors based on sustainability reports of Südzucker AG [63]; Dr. August Oetker Nahrungsmittel KG [64]; Symrise AG [65]; KWS SAAT SE & Co. KGaA [66]; BayWa AG [67] (non-financial declaration under the German Commercial Code – HGB; limited assurance); HelloFresh SE [68] (non-financial report for 2024; limited assurance in CSRD/ESRS format); DMK Group [69] (cooperative "Responsibility Report" without independent assurance).

It is important that a content analysis of published approaches shows the dominance of the Global Reporting Initiative (GRI), the Task Force on Climate-related Financial Disclosures (TCFD), and the Carbon Disclosure Project (CDP) as the "operational" methodological bases, supplemented by new ESRS disclosures (double materiality, value chains, taxonomy indicators). For part of the sample (notably Südzucker, Symrise, BayWa, HelloFresh), key topics of climate (ESRS E1), labour (ESRS S1), and ethics (ESRS G1) were identified as material, reflecting the universality of risks in food and ingredient business models (GHG emissions in the supply chain, workplace safety and seasonality, anti-corruption risks and compliance).

The assurance format mainly relies on the ISAE 3000 and its sector-specific applications. For certain indicators (greenhouse gas emissions), companies demonstrate elements compatible with ISAE 3410 and ISO 14064-3, which aligns with the European ESG audit practice of "limited-first" (limited assurance first, then expanding the scope and depth of procedures).

With the entry into force of the ISSA 5000 for periods beginning on December 15, 2026, further unification of approaches and convergence of non-financial audit methodologies across jurisdictions and among Big Four networks and other international assurance providers is expected.

In this context, the EU regulatory framework was recently revised through the EU Omnibus Simplification Package. This initiative aims to reduce the administrative burden associated with the CSRD and potentially postponing some elements, while emphasising the standardisation of procedures for limited assurance. Several analytical reviews highlight that the initial logic of a "mass" transition to reasonable assurance under CSRD by 2028 may be softened or gradually revised in light of this package. Nevertheless, companies in the agricultural sector are already investing in internal data control, digital traceability of supply chains, and integration of non-financial KPIs into management reporting systems. These steps are essential for the future expansion of audit depth.

4.3. Features of sustainability reporting audits of Ukrainian agro-industrial companies

The analysis of Ukrainian agro-industrial companies reveals significant fragmentation in sustainability reporting practices. Only 3–4 companies currently prepare reports aligned with the GRI Standards or guided by the UN Global Compact principles; approximately 30% limit themselves to declarative CSR publications; and around 30% do not disclose non-financial information publicly at all [70]. A negative trend is also evident: the number of GRI-reporting companies declined from four in 2018 to three by 2019–2020 [70], and has not recovered since. Formalistic references to GRI or UN SDGs without substantive disclosure are common, reflecting the imitative rather than substantive nature of many initiatives [3]. The detailed overview of the seven largest companies by land bank is presented in Table 4.

A comparison of the three leading Ukrainian agricultural companies shows significant differences in the level of sustainability reporting integration. For example, Kernel Holding S.A. prepares systematic sustainability reporting that includes

environmental, social, and governance indicators with quantitative metrics close to the requirements of the ESRS. The company discloses data on energy consumption, greenhouse gas emissions across Scope 1–3, water use, waste, labour, and economic indicators. However, no independent audit of ESG data is conducted, which differentiates it from practices in Germany.

Table 4

Practices of sustainability reporting and its audit among the largest agricultural companies in Ukraine

Company (sector)	Turnover (2024), bn EUR	Employees, persons (approx.)	Land bank, ha	Sustainability reporting and features
Kernel Holding S.A. [19] (crop production, processing, export)	3.6	10,000	530,000	Annual sustainability reports aligned with GRI standards; no external assurance of sustainability reporting (in 2024 PwC audited only the financial statements)
Ukrlandfarming [71] (crop production, livestock, food production)	n/d	n/d	500,000	No sustainability reporting; only a sustainability section on the website without metrics
MHP SE [21] (crop production, livestock, meat processing, feed, biogas, construction materials)	3.0	36,000	370,000	Sustainability reports since 2015, without external assurance; since 2016 based on GRI standards, with reports published until 2021; declares contribution to UN SDGs
Agroprosperis [72] (crop production, financing, storage, export)	0.61	6,000 – 8,000	300,000	No sustainability reporting or sustainability-related information available
Astarta Holding PLC [20] (sugar production, crop production)	n/d	n/d	235,000	Previously included CSR reports in annual reports; in recent years issued separate GRI-based reports with external assurance; supports the 10 UN Global Compact principles and UN SDGs; for 2024 published a sustainability report partly aligned with CSRD and ESRS
Continental Farmers Group [73] (crop production, export)	n/d	n/d	195,000	Provides an interactive CSR map; CSR reports include details on tax payments and social investments
Epitsentr Agro [74] (crop production)	n/d	n/d	160,000	No public non-financial reporting; website contains only CSR principles

Note. n/d – no data.

Source: systematised by the authors based on sustainability reports and company websites [19; 20; 21; 71; 72; 73; 74].

Astarta Holding PLC in its 2024 annual report demonstrates substantial progress, as it already applies CSRD and ESRS requirements and performs a double materiality assessment. The reporting is structured according to European approaches: it discloses policies, risks, implemented governance structures, due diligence processes, and identifies material impacts, risks, and opportunities (IRO). The report clearly shows the integration of internal sustainability factors into the business model, as well as the company's impacts on the environment and society. This aligns with the expectations of the EU CSRD.

Continental Farmers Group, on the other hand, publishes a report that is mostly social in nature: it covers tax contributions, community investments, cultural, and educational projects. It lacks a structured environmental and governance component and does not include quantitative metrics under international standards. The report is declarative and not integrated into financial reporting. In this respect, Continental remains at an early stage of alignment with European practices.

From a legitimacy theory perspective [33], this pattern reflects a classic "symbolic adoption" strategy: companies publish sustainability reports not to substantively improve governance but to signal alignment with societal expectations and investor preferences. The near-absence of independent assurance, as evidenced across the Ukrainian sample, further confirms that legitimacy maintenance – rather than genuine accountability – drives current disclosure practices [32]. Under wartime conditions, this dynamic is intensified: external audiences (international investors, EU institutions) have heightened expectations of transparency precisely when internal data systems are most disrupted.

The results of the analysis of sustainability reporting of these companies are summarised in Table 5.

An examination of the sustainability reporting of three leading companies in Ukraine's agro-industrial complex demonstrates that the national system of sustainability reporting and auditing is still in its formative stage and shows considerable differentiation. Kernel Holding S.A. aligns with CSRD and ESRS requirements through the inclusion of quantitative environmental and social indicators, yet the absence of independent verification highlights the limited maturity of its reporting and auditing practices. At the same time, Astarta Holding PLC in its most recent 2024 report has already integrated the principle of double materiality and due diligence procedures, which align with key European requirements, although its technical data collection base and audit processes are still developing. Continental Farmers Group, by contrast, remains at a declarative level, limiting itself to presenting social projects without structured environmental and governance components.

This spectrum – from full CSRD alignment (Astarta Holding PLC) to purely declarative CSR (Continental Farmers Group) – illustrates Oliver's [35] typology of organisational responses to institutional pressure, ranging from compliance through compromise to symbolic conformity.

Overall, Ukrainian agro-industrial companies are only beginning to integrate sustainability reporting into systematic corporate governance practices. The main

features include fragmented disclosure of data, lack of external assurance, insufficient quantitative metrics in physical units, and a gradual, adaptive alignment with European standards. At the same time, positive examples, as seen in Astarta, indicate a gradual convergence with EU norms, which opens up opportunities to build investor confidence and integrate into the European market.

Table 5

Main criteria of sustainability reporting and its audit, as disclosed by Ukrainian companies Kernel Holding S.A., Astarta Holding PLC, and Continental Farmers Group

Criterion	Kernel Holding S.A.	Astarta Holding PLC	Continental Farmers Group
Reporting standards	Elements of the Global Reporting Initiative (GRI), EU Taxonomy, TCFD, SBTi	European Sustainability Reporting Standards, Corporate Sustainability Reporting Directive, GHG Protocol, TCFD, SBTi	Corporate Social Responsibility (CSR) report, not aligned with ESRS
Audit of non-financial reporting	No independent audit (self-disclosure). In 2024, PwC audited only financial reporting	Partial: internal control + projects with EBRD and EY. In 2024, the sustainability report was audited by Kreston (limited assurance) under ISSA 5000, ISAE 3000 (Revised)	No audit
Double materiality principle	Partially applied (outward impacts only)	Fully implemented in 2024 (double materiality)	Not applied
Environmental block (E)	Yes: energy, water, Scope 1–3 emissions, waste	Yes: climate, energy, waste, biodiversity	No (no quantitative environmental data)
Social block (S)	Yes: employment, training, workplace injuries	Yes: own employees, communities, human rights	Yes: communities, education, healthcare, army
Governance block (G)	Partially: selected corporate data	Yes: anti-corruption policy, good governance, supervisory bodies	Limited (corporate culture, without structured G practices)
Metrics (physical/financial)	Quantitative metrics (tons, TJ, million USD)	Quantitative + qualitative metrics (in physical and financial units)	Only financial indicators (taxes, social spending)

Source: developed by the authors based on sustainability reports and company websites [19; 20; 73].

Thus, the actual state of reporting in Ukraine can be described as transitional: moving from declarative CSR reports toward more formalised reports aligned with international standards. Further progress will require institutional reforms, the establishment of external verification mechanisms, and harmonisation with CSRD/ESRS requirements, which will be a key factor in the competitiveness of Ukrainian agribusiness companies in the international environment.

4.4. Developing the conceptual framework for the sustainability reporting and audit system of Ukraine's agro-industrial enterprises

The development of a sustainability reporting and audit system in Ukraine requires comprehensive integration of European approaches while taking into account the national realities of state statistics and regulatory reporting. At this stage, there is a significant gap between the sustainability reporting of major agro-industrial companies and state reporting forms (No. 1-PV, No. 1-Waste, No. 2-TP (Water Management), environmental tax declaration). The CSRD obliges companies subject to its provisions to apply the principle of double materiality, covering both the financial impact of sustainability on business and externalities – the impact of business on society and the environment. Ukrainian companies currently either do not apply this principle or limit themselves to declarative references. Its implementation is key to building a mature sustainability reporting system suitable for independent audit.

In this context, three main directions for the development of the reporting and auditing system can be identified. First, optimisation of ESG reporting should be achieved through harmonisation of corporate indicators with state reporting forms in order to avoid duplication and ensure the integrity of databases. For instance, water use data (Form No. 2-TP (Water Management)) or workplace injury data (Form No. 9-PV) could serve as the basis for international GRI/ESRS metrics after independent verification. Second, widespread adoption of accountability and audit tools requires consideration of agribusiness size. The findings underscore that larger enterprises (over 1,000 hectares) have greater financial and human resources for implementation, while small and medium enterprises need state and NGO support. This could include consulting services from agricultural advisory agencies and associations of agricultural producers. Third, institutionalised transparency must be enhanced by introducing independent audits of sustainability indicators. Applying ISAE 3000 and the forthcoming ISSA 5000 enables the verification of non-financial data with the same level of reliability as financial reporting, particularly within the "reasonable assurance" framework, which the EU will enforce starting in 2028. Fourth, competence must be strengthened through staff training, the creation of ESG committees at boards of directors of large enterprises, and the implementation of integrated data collection systems that combine internal registers, accounting and energy balances with digital platforms.

For auditors, these directions set clear priorities. First, the focus shifts from verifying the formal presence of policies to evaluating their effectiveness based on key performance indicators (KPIs). Second, auditors should adapt to verifying data not covered by state statistics (e.g., Scope 3 greenhouse gas emissions or social investments in communities). Third, audit procedures should include analytical reconciliation between corporate metrics and government data, which minimises greenwashing risks and builds trust among international investors. The phased implementation of CSRD/ESRS standards, combined with independent audit practices, will thus enable Ukrainian agro-industrial companies to transition to a mature sustainability reporting system aligned with European practice (Table 6).

Table 6

Implications for "reasonable assurance" audits based on internal accounting data, state reporting, and international sustainability reporting standards

Block	Indicator under international reporting standards	Internal sources	State reporting (Ukraine)	Implications for audit
1	2	3	4	5
Environment	Total electricity consumption (GRI 302 "Energy use"; ESRS E1 "Climate change")	Energy balances, invoices, energy logbooks	Partially – Form No. 1 "Environmental costs"	Verification required: data only aggregated; no breakdown by energy source; risk of underestimating Scope 2
	CO_2 emissions Scope 1 and Scope 2 (GRI 305 "Emissions"; ESRS E1 "Climate change")	Emissions inventory, supplier data	Form No. 2-TP (Air), environmental tax declaration	Scope 3 not included in state reporting, external confirmations needed; additional audit procedures required to mitigate greenwashing risk
	Water use and discharges (GRI 303 "Water and Effluents"; ESRS E3 "Water and marine resources")	Logs, water use permits	Form No. 2-TP (Water management)	Gap between corporate data and state reporting, alignment of different approaches needed
	Waste generation (hazardous / household) (GRI 306 "Waste"; ESRS E5 "Resource use and circular economy")	Waste logs, transfer acts	Form No. 1-Waste	Auditor must check waste transfer chains, verify hazard classifications
Social	Number of employees, staff turnover (GRI 401 "Employment"; ESRS S1 "Own workforce")	HR reports, staffing schedules	Form No. 1-PV "Labour report", consolidated payroll report to the tax service	Duplication with state reporting, auditor checks data consistency; risk of distorted social indicators
	Employee training (GRI 404 "Training and Education"; ESRS S1 "Own workforce")	Learning management system (LMS)	Not standardised	Independent calculation of training and upskilling effectiveness required
	Workplace injuries (GRI 403 "Occupational Health and Safety"; ESRS S1 "Own workforce")	HSE logs (health, safety, environment), accident reports	Not standardised	Data should be confirmed by external supervision (e.g., factory webcams); possible underreporting of accidents
	Local communities (GRI 413 "Local Communities"; ESRS S3 "Affected Communities")	Contracts, acts of goods/service delivery	Not standardised	High level of self-reporting without external verification; high risk of unreliable data
	Anti-corruption policy (GRI 205 "Anti-corruption"; ESRS G1 "Business conduct")	Internal codes, compliance reports	Not standardised	Auditor checks policy presence; no KPIs; effectiveness testing required

Continuation of Table 6

1	2	3	4	5
Governance	Supply chain transparency (GRI 308 "Supplier Environmental Assessment"; ESRS S2 "Workers in the value chain")	Contracts, agreements with agreed requirements	Not standardised	Data fragmented, difficult to verify suppliers' environmental aspects
	EU Taxonomy alignment (ESRS E1–E5, S1–S4, G1)	Sustainability report	Not standardised	EU Taxonomy compliance statement requires auditor confirmation of taxonomy-aligned activities (e.g., pollution prevention, transition to circular economy)
Wartime-specific risks	Land use, soil condition, environmental damage (ESRS E4 "Biodiversity"; ESRS E2 "Pollution")	Pre-war land inventory, satellite imagery, damage assessment acts	Forms suspended or incomplete for war-affected territories under martial law simplifications	Scope limitation: physical access to damaged/occupied land parcels impossible; auditor must issue modified conclusion per ISAE 3000 §69; material portions of land-based indicators (soil carbon, water abstraction, biodiversity) unverifiable by standard procedures

Source: systematised by the authors.

Based on the conducted analysis, the study outlined a conceptual framework for the development of sustainability reporting and auditing in Ukraine in accordance with EU sustainability reporting standards and international auditing standards.

1. Institutional and organisational reforms. Large enterprises may establish sustainability and ESG committees at the level of boards of directors to ensure strategic management and control over non-financial indicators. To improve data quality, digital accounting systems should be introduced (covering energy consumption, waste, water use, workplace accidents), integrating corporate registers with state reporting forms. An integral part of this process is organising regular training sessions for personnel to ensure an understanding of CSRD/ESRS requirements and the ability to implement them in practice. At the same time, small and medium-sized enterprises should receive state support for their sustainability initiatives, particularly through funding for consulting services provided by agricultural advisory bodies. Producer associations (such as the Agrarian Union of Ukraine and the Association of Farmers and Private Landowners) also play an important role in raising awareness [75].

2. Strengthening the system of independent verification. A key task is the introduction of sustainability reporting audits based on international standards ISAE 3000 and the forthcoming ISSA 5000. This will make it ensures the verifiability of the accuracy of data not covered by state statistics (including Scope 3 greenhouse gas emissions, social investments, and governance indicators). Such an approach will reduce risks of manipulation ("greenwashing") and align Ukrainian corporate practices with European requirements, where external assurance of sustainability indicators is

already standard practice [76]. However, the introduction of mandatory sustainability assurance carries non-trivial compliance costs that must be acknowledged. For small and medium agribusinesses, audit fees under ISAE 3000 or ISSA 5000 represent a significant financial burden – particularly under wartime conditions where liquidity is constrained [7]. There is also a risk that mandatory assurance requirements accelerate market concentration, as only large internationally affiliated audit firms possess the methodological capacity to conduct sustainability audits, potentially displacing national auditors [76]. A phased approach – beginning with limited assurance for large enterprises and extending requirements progressively based on company size and reporting maturity – would balance the benefits of independent verification against the economic realities of Ukraine's agribusiness sector.

3. Harmonisation of corporate and state reporting. Ukrainian agribusiness companies must align their non-financial metrics with official statistical and regulatory reporting (Forms No. 1-PV, No. 2-TP, No. 1-Waste, environmental tax). This approach will ensure data consistency, eliminate duplication, and form the basis for transitioning to the requirements of the CSRD and the ESRS. A key step is the integration of the double materiality principle, which allows for the assessment of both the financial impact of sustainability factors on business and the external effects of company activities on society and the environment.

4. Communication with investors and stakeholders. The development of sustainability reporting must be accompanied by new communication tools: integrated annual reports, investor presentations, public webinars, and open stakeholder consultations [77]. This will enhance transparency and trust in Ukrainian companies while ensuring competitiveness in the European capital market, where compliance with CSRD and ESRS is becoming a mandatory condition.

In conclusion, the improvement of sustainability reporting audits for Ukraine's agribusiness sector requires the simultaneous harmonisation of corporate and state indicators, the introduction of independent verification of non-financial data, and the establishment of institutional ESG governance mechanisms. Only through the comprehensive implementation of the double materiality principle, integration of international auditing standards, and development of digital accounting systems will it be possible to build a mature reporting model aligned with CSRD and ESRS requirements. This will be key to enhancing the transparency of Ukrainian agricultural companies, minimising greenwashing risks, and building trust among international investors and society.

5. DISCUSSION

The case for a hybrid rather than fully harmonised model rests on both theoretical and practical grounds. Drawing on C. Oliver's [35] framework of strategic responses to institutional pressures, full compliance with CSRD/ESRS in the Ukrainian context is currently neither feasible nor optimal: the absence of established audit infrastructure, the wartime disruption of data systems, and the disconnect between corporate ESG metrics and state reporting forms create conditions where mimetic adoption of

European standards without adaptation would produce symbolic rather than substantive reporting. Institutional theory further suggests that premature isomorphism – adopting the form of European standards without the underlying institutional capacity – risks delegitimising the entire reporting system [34]. A hybrid model, by contrast, builds on existing state reporting infrastructure (Forms No. 1-PV, No. 2-TP, No. 1-Waste) as a verifiable data foundation, progressively aligning it with CSRD/ESRS requirements as institutional capacity develops. This approach is consistent with the ESGI-reporting concept emerging in Ukrainian academic literature [55], which integrates sustainability disclosure with investment mobilisation priorities specific to the reconstruction context.

These findings partly confirm and partly extend the conclusions of P. Velte and M. Stawinoga [18], who identify mandatory sustainability assurance as a driver of audit market concentration and question whether the shift from limited to reasonable assurance produces substantive rather than merely formal improvements in disclosure quality. Whereas their analysis focuses on mature EU markets where assurance infrastructure already exists, the Ukrainian case reveals an earlier and more fundamental challenge: the risks of formalisation without substance, Big Four dominance, and limited assurance as a ceiling rather than a floor are amplified – not moderated – in a context where no systemic assurance practice exists at all. The near-total absence of independent verification across the Ukrainian sample supports G. Manetti and L. Becatti's [11] observation that limited assurance remains the dominant format due to its lower resource intensity, but adds a more critical dimension: in Ukraine, even limited assurance is exceptional rather than standard.

From a political economy of accounting perspective [58], the choice between full isomorphism and a hybrid model is not merely technical but reflects a geopolitical positioning strategy: Ukrainian agribusinesses that align with CSRD signal integration readiness to EU capital markets, while those that retain state-form-based reporting serve domestic regulatory compliance – a dual logic that a hybrid model is uniquely positioned to reconcile.

In wartime conditions, Ukrainian enterprises face a dual pressure. On the one hand, internal legitimacy is maintained through reporting on tax contributions, social investments, and support for the military (as demonstrated by Continental Farmers Group). On the other hand, external legitimacy is ensured by gradually integrating into the European reporting space in line with the CSRD and the ESRS. As C. Deegan [32] notes, non-financial reporting often functions as a tool for responding to social pressure and aligning corporate practices with shifting societal norms – an effect amplified in Ukraine by the war context.

The specific feature of the Ukrainian context is the emergence of a "hybrid model" of reporting, combining elements of European standards (CSRD, ESRS) with national strategic priorities, particularly investment. An example of such adaptation is the ESGI-reporting initiative (Sustainability and Investment Reporting), proposed within the MSCA4 Ukraine program [55]. Unlike the traditional ESG approach, this model integrates the investment dimension, transforming sustainability reporting into a tool

for mobilising financial resources for the recovery of the agricultural sector. In wartime conditions, such transformation is particularly important: reporting becomes a mechanism for demonstrating companies' resilience and their ability to attract investment for rebuilding production capacity and supporting social infrastructure [55].

Political economy allows us to interpret this process as a form of "social contract" between the state, business, and society. On the one hand, the state, through regulatory initiatives (for example, the Resolution of the Cabinet of Ministers of Ukraine of 18 October 2024 on the introduction of sustainability reporting), establishes institutional frameworks that encourage companies to report. On the other hand, businesses, by demonstrating transparency and accountability, gain access to EU capital markets and international financial assistance programs such as the Ukraine Facility [1]. As a result, sustainability reporting in Ukraine functions not only as an internal accountability mechanism but also as an instrument of macro-financial stabilisation and integration into global investment flows.

Independent auditing plays a key role in ensuring the reliability of non-financial reporting by encompassing control procedures, risk assessments, and monitoring of ESG data systems [78]. Effective auditing methods contribute to regulatory compliance, operational stability, and improved quality of financial and non-financial reporting. At the same time, organising sustainability reporting and audit services demands significant financial and human resources – a constraint that is particularly acute for agribusinesses operating under wartime conditions [7]. This situation creates a risk of undermining the legitimacy of sustainability reporting, as producing reports merely to "meet requirements" may lead to manipulation, distortion, or deliberate misrepresentation of data. Consequently, scholars and practitioners increasingly emphasise the need for new instruments of assurance for sustainability information, which may be applied on both a voluntary and mandatory basis [79].

From a broader perspective, it can be argued that the Ukrainian case reflects an accelerated transformation of sustainability reporting. Unlike the gradual evolutionary development in EU countries, where companies enjoyed several years of transition from voluntary practices to mandatory CSRD/ESRS audits, Ukrainian companies are compelled to adopt reasonable assurance practices immediately. This makes their experience a unique example of how corporate reporting simultaneously serves as a mechanism of sustaining social trust domestically and a means of institutional integration into the European space.

The advantages of this study over existing research stem from three distinctive features of its design. First, unlike prior literature – which has predominantly examined either mature EU economies in isolation or addressed Ukraine only fragmentarily and without up-to-date empirical evidence – this study offers the first systematic side-by-side comparison of sustainability reporting and assurance practices in the agro-industrial sectors of Germany and Ukraine. This comparative lens reveals institutional and methodological gaps that single-country analyses cannot capture. Second, by grounding the analysis in current corporate reports (2022–2025) and the most recent regulatory developments (CSRD, ESRS, ISSA 5000), the study fills a gap in the

literature, where actual, contemporary evidence on the Ukrainian agribusiness sector has been largely absent. The proposed solutions close the problematic part of this gap by demonstrating concretely how sustainability reporting and assurance can be improved in Ukraine – specifically, by anchoring ESG metrics in existing state reporting infrastructure, phasing in independent verification according to enterprise size, and institutionalising ESG governance. The extent to which these solutions resolve the problem is necessarily partial and conditioned by the current state of the regulatory framework: Ukraine still lacks an adequate normative base and defined implementation mechanisms for sustainability reporting and its assurance, which constrains the immediate applicability of the recommendations and explains why a hybrid, adaptive pathway – rather than full isomorphic adoption – is proposed. Finally, the practical and policy implications of these results are oriented toward outcomes: the consistent application of double materiality, strengthened internal ESG data controls, and evidence-based assurance under ISAE 3000 and ISSA 5000 are expected to reduce greenwashing risks, enhance the credibility of corporate reporting, and thereby raise the level of trust among international investors and stimulate inflows of investment critical to the post-war recovery of Ukraine's agricultural sector.

6. CONCLUSIONS

The comparative analysis reveals a fundamental asymmetry in institutional maturity between Germany and Ukraine, and its structural sources deserve closer attention. Germany's methodological fragmentation under coexisting standards (GRI, SASB, TCFD, ESRS) reflects a deeper tension between two reporting philosophies: investor-oriented (ISSB/IFRS) and stakeholder-oriented (GRI). CSRD and ISSA 5000 address this tension through procedural standardisation rather than conceptual resolution. The transition to mandatory limited assurance, and eventually to reasonable assurance by 2028, moves the system toward comparability. Yet even in a mature regulatory environment, harmonisation remains incomplete.

For Ukraine, the gap is more foundational. A structural disconnect exists between corporate ESG disclosures and mandatory state reporting forms (No. 1-PV, No. 2-TP, No. 1-Waste) that has no equivalent in the German regulatory context. This disconnect was empirically documented across all seven Ukrainian companies in the sample. Where companies do publish sustainability reports, the underlying data cannot be independently verified against any anchored baseline. Greenwashing, in this context, becomes structurally possible rather than merely behavioural.

The study's primary contribution is the conceptualisation of a hybrid adaptive model for sustainability assurance under wartime and transitional conditions. This model is not a restatement of CSRD/ESRS requirements but an original response to conditions absent from existing literature. The physical inaccessibility of agricultural assets in war-affected territories creates inherent scope limitations under ISAE 3000/ISSA 5000 that standard audit protocols do not address. Ukraine must also reach reasonable assurance readiness by 2028 without the decade-long regulatory evolution Germany underwent, compressing the institutional reform timeline significantly. At

the same time, Ukrainian agribusinesses face dual legitimacy pressure, maintaining domestic social legitimacy through wartime contributions while aligning ESG disclosures with EU requirements. The hybrid model addresses these conditions by anchoring ESG metrics in existing state reporting infrastructure and progressively expanding audit scope based on company size and reporting maturity. Full isomorphic adoption of CSRD/ESRS cannot provide this pathway.

More broadly, the findings show that in transitional economies under crisis conditions, the primary barrier to sustainability assurance is not market concentration or resource intensity. It is the absence of a verifiable data baseline. This finding extends beyond Ukraine to any economy simultaneously pursuing European integration and managing active war or post-war reconstruction.

7. LIMITATIONS AND FUTURE RESEARCH

The limitations of this study are primarily related to the availability of the information base. The analysis was based exclusively on publicly available corporate reports, official company websites, regulatory documents and open analytical sources. This is especially important for the Ukrainian context, since a significant part of agro-industrial enterprises either do not publish separate sustainability reports or are limited to short declarative messages on social responsibility. Accordingly, the study could not cover a wider range of companies and practices that potentially exist but are not represented in the open information space. A similar limitation applies to German companies. Despite a higher level of regulatory maturity and a more developed sustainability reporting practice, some internal information on data collection procedures, internal control, audit procedures and methods for verifying non-financial indicators remains closed to external users. Therefore, the conclusions of the study are based only on the data that companies officially disclose in their annual, integrated, non-financial or sustainability reports.

A further limitation concerns the absence of primary qualitative data collected through interviews or surveys with company managers, ESG specialists, auditors, or regulatory representatives. Such data would have enabled a deeper assessment of the internal processes behind sustainability disclosures – including data collection systems, internal control procedures, and the practical challenges of audit readiness – which cannot be fully reconstructed from published reports alone. This limitation is particularly relevant for the Ukrainian context, where the gap between formally disclosed information and actual internal practices may be substantial. Future research should address this by incorporating structured interviews or expert surveys to complement document-based analysis.

Another limitation is the geographical focus of the study. The article compares the practices of Ukraine and Germany, since Germany is an example of a European Union country with a high level of institutionalisation of corporate reporting regulation, a developed system of non-financial disclosure and a gradual transition to mandatory assurance sustainability reporting. At the same time, the study does not cover the experience of other EU countries, in particular the countries of Central and Eastern

Europe, which could be closer to Ukraine in terms of institutional trajectory, structure of the agricultural sector or level of adaptation to the requirements of CSRD and ESRS.

In this regard, further research should be aimed at expanding the comparative base by including other European countries, in particular Poland, Romania, the Czech Republic, Slovakia or the Baltic countries. Such an approach would allow us to identify not only the differences between Ukraine and the highly developed regulatory model of Germany, but also intermediate models of institutionalisation of sustainability reporting and assurance in countries that have similar experience of economic transformation and European integration to Ukraine.

In addition, a promising direction for future research is an in-depth analysis of the internal procedures for forming non-financial indicators at the enterprise level. This involves using not only public reports, but also data obtained through interviews with managers, auditors, ESG specialists and representatives of regulatory authorities. Such an approach would allow us to better assess not only the formal compliance of reporting with the requirements of CSRD, ESRS and ISSA 5000, but also the real quality of the systems for collecting, monitoring and independent verification of ESG data.

AUTHOR CONTRIBUTIONS

All authors contributed equally to this work.

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