

Environmental, Social, and Governance: A Review of Frameworks, Metrics, and Reporting for Sustainable Development

Ahmad Faizal Mohd Yusof^{1*}, Hasti Widyasamratri²

¹Urban and Environ Holding, Kota Kemuning, Section 31, 40460 Shah Alam, Selangor, Malaysia

²Department of Urban and Regional Planning, Faculty of Engineering, Sultan Agung Islamic University, Semarang, Indonesia

Correspondence: ahmadfmy909@gmail.com

SUBMITTED: 3 September 2025; REVISED: 16 October 2025; ACCEPTED: date

ABSTRACT: Environmental, social, and governance (ESG) aspects have become a key framework for assessing corporate performance, extending beyond traditional financial metrics, emphasizing sustainability, ethical conduct, and long-term resilience. This overview article synthesizes the fundamental elements of ESG and discusses its three pillars: environmental, social, and Corporate Governance. This article also examines the complex landscape of ESG metrics and rating systems, highlighting how differences in vendor criteria and methodologies including metric selection, weighting schemes, data sources, and disclosure verification, lead to significant differences in ESG scores across rating agencies such as MSCI, Sustainalytics, and Refinitiv. Differences in the processing of qualitative and quantitative data, sectoral adjustments, and reliance on self-declarations contribute to inconsistent results and limited comparability. Furthermore, the paper reviews leading global and regional ESG reporting frameworks, including the Global Reporting Initiative (GRI), the Task Force on Climate-related Financial Disclosures (TCFD), the Bursa Malaysia Sustainability Reporting Guidelines, and the Sustainability Accounting Standards Board (SASB), discussing their scope, applicability, and regional implementation. Despite its growing popularity, ESG assessments still face significant limitations, such as inconsistent data quality, a lack of standardization in reporting systems, and potential reporting errors, which undermine the credibility and comparability of ESG assessments. The analysis highlights that effective ESG implementation is crucial for risk management, investor confidence, regulatory compliance, and sustainable value creation, particularly in resource-intensive industries such as construction, manufacturing, and energy.

KEYWORDS: ESG; sustainability; reporting frameworks; metrics; corporate governance; sustainable development.

1. Introduction

The global business environment is undergoing a fundamental transformation, moving beyond a singular focus on financial metrics to a more holistic view of corporate value that incorporates environmental stewardship, social responsibility, and ethical governance. While this shift

towards ESG principles is widely recognized, its implementation is fraught with complexity. Companies, investors, and regulators face a fragmented landscape characterized by a lack of standardized definitions, a proliferation of competing metrics and rating agencies with differing methodologies, and a diverse array of reporting frameworks. This inconsistency creates significant challenges: it impedes the accurate measurement and comparison of corporate ESG performance, leads to potential "greenwashing," complicates risk assessment for investors, and hinders the ability of organizations to develop a clear and strategic path toward genuine sustainability. Consequently, there is a pressing need to synthesize and clarify this complex ecosystem to enable more effective adoption, transparent reporting, and credible assessment of ESG performance [1–3]. To address these gaps, this paper is structured as follows: Section 2 provides an overview of ESG frameworks, outlining their conceptual foundations and three key pillars. Section 3 discusses ESG performance measurement, focusing on variation across metrics and rating methodologies. Section 4 examines the main ESG reporting frameworks, with a particular focus on global and regional practices. Section 5 examines the impact of ESG implementation on corporate strategy, risk management, and sustainability performance. Section 6 concludes, highlighting current limitations and suggesting directions for future research.

The critical importance of this topic is underpinned by several key factors. First, stakeholder pressure is a powerful driver; investors are increasingly allocating capital based on ESG criteria, consumers are demanding greater corporate accountability, and regulators worldwide are moving to make ESG disclosures mandatory [4, 5]. Second, a strong ESG proposition is directly linked to tangible business benefits, including enhanced long-term financial performance, improved risk management, stronger brand reputation, and greater resilience against market volatility. Third, the core of the challenge lies in the intricacies of the ESG ecosystem itself [6, 7]. The three pillars Environmental (carbon emissions, waste management), Social (labor practices, community relations), and Governance (board structure, transparency), are interconnected yet complex to measure [8, 9]. Furthermore, the existence of multiple key reporting frameworks such as the comprehensive GRI, the climate-focused TCFD, and the investor-oriented SASB, adds another layer of complexity for organizations seeking to disclose their performance [10, 11]. The primary objective of this review article is to provide a consolidated, clear, and comprehensive overview of the contemporary ESG ecosystem for an audience of academics, business practitioners, and investors. It aims to demystify the core components and clarify the prevailing ambiguities surrounding ESG.

2. The ESG Framework

2.1. Definition of ESG.

ESG stands for Environmental, Social, and Governance. It is a framework utilized for evaluating how well an organization manages its business in the face of sustainability and ethical challenges, providing a way to quantify commercial opportunities and risks in these domains. ESG investing is a practice used by investors to assess firms and determine investment plans. The framework consists of three interconnected pillars, Environmental, Social, and Governance, that collectively influence a company's success, sustainability performance, and long-term returns. A stronger ESG performance contributes to sustainable

development, benefiting the organization through improved environmental management, positive social impact, and strong business ethics [1, 2].

2.2. Environmental pillar.

The Environmental pillar focuses on how a company interacts with and impacts the natural environment, emphasizing sustainable resource use and minimizing ecological harm (Table 1). It encompasses a broad range of factors, including energy consumption patterns, greenhouse gas emissions, water and air quality, natural resource conservation, biodiversity protection, and waste generation. Companies are increasingly expected to adopt practices that reduce their ecological footprint, such as implementing renewable energy solutions, enhancing energy efficiency, and adopting circular economy approaches in waste and material management [12, 13].

Table 1. ESG pillars and key considerations.

Pillar	Focus	Key Considerations	Importance	Ref
Environmental	Company's interaction with and impact on the natural environment	- Energy use and efficiency - Greenhouse gas emissions (direct & indirect) - Water and air quality - Waste and hazardous material management - Natural resource conservation & biodiversity protection - Climate policies (TCFD-aligned disclosure, carbon neutrality targets)	Critical due to climate crisis; high-impact sectors (energy, mining, transport, construction) are under scrutiny. Strong environmental practices reduce risks, enhance resilience, and strengthen stakeholder trust.	[4, 6, 12–17]
Social	Human dimension of business operations and stakeholder relationships	- Labor rights and workplace safety - Employee development, diversity, and inclusion - Fair wages and benefits - Customer satisfaction and data security - Ethical supply chain practices - Community engagement, investment, and addressing social inequality	Strong social practices improve employee retention, customer loyalty, and reputation. Companies that address social issues and support communities gain long-term trust and a stronger social license to operate.	[18–21]
Governance	Systems of rules, oversight, and accountability guiding company direction	- Board diversity and structure - Executive remuneration - Shareholder rights and transparency - Internal controls and risk management - Ethical codes of conduct - Sustainability and financial disclosures - Cybersecurity and data protection	Provides the foundation for effective E & S management. Robust governance fosters accountability, reduces corruption, ensures compliance, and enhances investor confidence, resilience, and long-term value creation.	[6, 22–25]

Within ESG assessments, the Environmental pillar evaluates both risks and opportunities associated with environmental performance. This includes monitoring direct and indirect greenhouse gas emissions, managing hazardous and non-hazardous waste, reducing reliance on finite resources, and ensuring compliance with environmental regulations and international

agreements. Companies are also assessed on their climate strategies, such as carbon neutrality targets, adaptation plans, and disclosure practices aligned with frameworks like the TCFD. Previous studies examined the relationship between ESG factors and the financial performance of 60 European automotive companies from 2011 to 2022. The results show that social initiatives increase profitability (ROA), while pro-environmental activities slightly reduce it due to higher sustainability costs, and corporate governance has no significant impact. In the case of market valuation (Tobin's Q), social factors are perceived negatively by investors, while corporate governance has a weak positive impact, highlighting the complex relationship between sustainability goals and financial performance [4, 6, 14, 15].

The importance of this pillar is heightened by the escalating global climate crisis. Industries with high environmental impact such as energy, mining, transportation, and construction, are under particular scrutiny, as they contribute disproportionately to carbon emissions and resource depletion. For example, the construction sector alone is responsible for a significant share of global CO₂ emissions due to energy-intensive material production and large-scale land use. Consequently, robust environmental governance not only reduces operational risks but also enhances long-term resilience, competitiveness, and stakeholder trust [16, 17].

2.3. Social pillar.

The Social pillar emphasizes the human dimension of business operations, focusing on how companies engage with employees, customers, suppliers, and the broader communities in which they operate. It covers a wide range of considerations, including labor rights, workplace safety, employee development, diversity and inclusion, customer satisfaction, community investment, and data protection. Central to this pillar are internationally recognized human rights frameworks, such as the Universal Declaration of Human Rights (UDHR) and International Labour Organization (ILO) standards, which establish the baseline for fair and ethical treatment of individuals [18, 19].

Companies are expected to ensure safe working conditions, provide fair wages and benefits, respect freedom of association, and create opportunities for training and professional growth. Beyond internal practices, the social pillar extends to supply chain management, where businesses are held accountable for labor practices and ethical sourcing of raw materials. Social responsibility also involves safeguarding consumer interests by maintaining high product quality, protecting data privacy, and ensuring transparency in marketing [20, 21].

Moreover, companies are increasingly called upon to address social inequalities and contribute to community development. This can include supporting marginalized groups, investing in local infrastructure, and promoting inclusive practices. In this way, companies not only increase their social license to operate but also build trust and long-term loyalty among stakeholders. In today's interconnected world, strong social performance is closely linked to business resilience, as organizations with engaged employees, inclusive workplaces, and positive community relations typically experience higher productivity, lower turnover, and faster recovery from crises. Research has shown that socially responsible companies often achieve better risk management, stronger brand reputation, and more stable financial performance, underscoring the importance of social sustainability as a foundation for long-term business success [18, 20].

2.4. Governance pillar.

The Governance pillar encompasses the framework of rules, policies, and decision-making processes that guide a company's leadership and accountability. It reflects the quality of oversight, transparency, and integrity within an organization. Key governance factors include board composition and diversity, executive remuneration, shareholder rights, internal controls, risk management, ethical codes of conduct, and the quality of financial and sustainability disclosures. Increasingly, governance also extends to digital security, addressing issues such as cybersecurity preparedness and protection of stakeholder data [22, 23]. While it often receives less public attention than Environmental and Social concerns, governance serves as the backbone that enables effective management of both. Strong governance ensures that sustainability commitments are embedded into strategic planning rather than remaining superficial pledges. It also fosters accountability by aligning executive incentives with long-term corporate performance, rather than short-term financial gains [2, 6, 24, 25].

Transparent governance practices are strongly associated with investor confidence, reduced corruption risks, and enhanced regulatory compliance. In contrast, weak governance can result in financial scandals, reputational crises, and erosion of stakeholder trust. Thus, robust governance systems not only protect companies against risks of mismanagement but also strengthen resilience, competitiveness, and long-term value creation [22–25]. However, governance effectiveness often depends on how well rules are enforced, not just on their documentation, as superficial compliance can create a false sense of accountability. Furthermore, a gap remains between governance frameworks and practical implementation, particularly in emerging markets, where institutional mechanisms for oversight and transparency are still developing.

3. Measuring ESG Performance

3.1. ESG metrics.

ESG metrics are quantitative and qualitative measures used within the ESG framework to evaluate a company's sustainability and ethical performance. These metrics aim to surpass conventional financial measures by integrating non-financial factors that influence stakeholder relations and risk management. They serve as guidelines for companies to achieve high performance across the three pillars. A significant challenge with ESG metrics is the lack of standardization; measurements can vary greatly between companies and ESG data vendors due to differing methodologies, criteria, and weighting of factors like sustainability, which can be inherently nebulous to quantify [26, 27].

3.2. Overview of ESG data vendors.

Numerous organizations provide ESG ratings and benchmarks, each employing unique criteria and procedures. Major global vendors include MSCI, Sustainalytics, Vigeo-Eiris, and Oekom [28]. These vendors balance qualitative and quantitative metrics and use various benchmarks and international standards to produce their ratings. Discrepancies in ratings arise from differences in country-specific systems, cultural contexts, and the specific areas of focus for each vendor. For instance, MSCI emphasizes quantitative performance with a letter-grade scale (AA-CCC), while Vigeo-Eiris focuses more on qualitative aspects like human rights with a

different scoring system (- to ++). This diversity provides a comprehensive, if sometimes fragmented, view of a company's sustainability standing [28, 29].

4. ESG Reporting Frameworks

4.1. GRI.

Table 2. Comparison of ESG Reporting Frameworks. The GRI is one of the most prominent and widely utilized sustainability reporting frameworks across the globe. Established in 1997, it was initially developed to create a standardized approach for organizations to disclose their environmental impacts, but it has since evolved into a comprehensive system that covers economic, environmental, and social dimensions of sustainability. GRI provides a structured set of standards categorized into Universal, Sector, and Topic-Specific Standards, which together guide organizations in measuring and communicating their impacts in a consistent and comparable way. This standardization allows stakeholders, including investors, regulators, employees, and communities, to better assess a company's sustainability performance.

Table 2. Comparison of ESG Reporting Frameworks.

Framework	Scope & Focus	Key Features	Benefits for Companies	Ref
GRI	Economic, environmental, and social sustainability	– Universal, Sector, and Topic-Specific Standards. – Global applicability. – Industry-specific standards (GRI-G4 for construction & real estate). – Strong emphasis on transparency and accountability.	– Enhances trust with stakeholders. – Improves risk management and long-term resilience. – Strengthens investor communication. – Aligns with SDGs and global goals.	[30–32]
TCFD	Climate-related financial risks and opportunities	– Four pillars: Governance, Strategy, Risk Management, Metrics & Targets. – Covers Scope 1, 2, and 3 GHG emissions. – Scenario analysis for climate risks. – Forward-looking, financial-market oriented.	– Improves preparedness for climate risks. – Enhances comparability for investors. – Mitigates financial and reputational risks. – Supports transition to a low-carbon economy.	[15, 33–35]
Bursa Sustainability Reporting Guide	Environmental, Economic, and Social (EES) with governance integration	– Tailored to Malaysian public-listed companies. – Focus on material issues and stakeholder inclusivity. – Complements global frameworks (GRI, TCFD). – Localized to regional sustainability challenges.	– Ensures compliance with Bursa Malaysia requirements. – Strengthens stakeholder trust and investor confidence. – Identifies context-specific risks and opportunities. – Positions firms in sustainable financing markets.	[15, 36, 37]
SASB	Industry-specific sustainability issues with financial materiality	– 77 industry-specific standards. – Focus on financially material ESG issues. – Integrates sustainability with financial reporting. – Part of the International Sustainability Standards Board (ISSB)	– Provides decision-useful data for investors. – Bridges ESG and financial reporting. – Enhances transparency and accountability. – Improves investor relations and long-term value creation.	[38–41]

The universal nature of GRI makes it applicable across industries and regions, while sector-specific standards, such as GRI-G4 for construction and real estate, ensure relevance to industries with unique sustainability challenges [30, 31]. In the European Union (EU), the GRI standard is widely adopted and serves as a key reference point, aligned with the EU Corporate Sustainability Reporting Directive (CSRD), promoting consistency and transparency in sustainability disclosure across all member states. As part of the EU, Romania has gradually integrated reporting practices based on the GRI standards, and many listed companies have adopted the GRI standards to meet EU disclosure requirements and demonstrate corporate responsibility in areas such as energy efficiency, social inclusion, and corporate governance integrity.

Importantly, the GRI standard emphasizes transparency and accountability, encouraging organizations not only to present achievements but also to disclose challenges, shortcomings, and areas for improvement. This openness strengthens trust between companies and their stakeholders. Beyond reporting, implementing the GRI standard can also serve as a strategic tool for organizations, enabling them to improve internal processes, manage risks, and ensure long-term resilience by integrating sustainability into their decision-making. It also strengthens investor communication by demonstrating a commitment to responsible business practices and highlighting how sustainability initiatives contribute to value creation. As sustainability becomes increasingly linked to financial performance and regulatory compliance, GRI reporting is seen as a key step towards ensuring companies remain competitive in a rapidly evolving global marketplace. Its global recognition and alignment with international goals such as the United Nations SDGs further solidify GRI's position as a cornerstone of sustainability reporting frameworks [31, 32].

4.2.TCFD.

The TCFD was established in 2015 by the Financial Stability Board with the aim of improving and standardizing climate-related financial disclosures. Unlike broader ESG frameworks, TCFD focuses specifically on the risks and opportunities associated with climate change and their potential financial implications for businesses. Its framework is structured around four key pillars: Governance, Strategy, Risk Management, and Metrics & Targets. Governance emphasizes the responsibility of boards and senior management in overseeing climate-related risks and opportunities, ensuring that climate considerations are embedded in corporate decision-making at the highest level. Strategy focuses on assessing how current and future climate-related impacts could affect a company's operations, business model, and overall resilience, often requiring scenario analysis to anticipate different climate outcomes. Risk Management addresses how organizations identify, assess, and manage both transition risks (such as policy changes and shifts in market preferences) and physical risks (such as extreme weather events and resource scarcity) [33, 34]. Finally, Metrics & Targets provide a quantitative basis for measuring climate performance, including disclosures on Scope 1, Scope 2, and Scope 3 greenhouse gas emissions. By providing a structured and forward-looking approach, TCFD helps companies demonstrate transparency and preparedness in the face of climate change. For investors and financial institutions, this enables more informed decision-making, as disclosures are consistent and comparable across industries and markets. Furthermore, TCFD has become increasingly influential as regulators and stock exchanges in many jurisdictions, including the UK, EU, and parts of Asia, have begun mandating climate

disclosures aligned with its framework. Companies adopting TCFD can not only mitigate reputational and financial risks but also identify opportunities in transitioning toward a low-carbon economy. This makes TCFD an essential tool for businesses seeking to integrate climate risk into strategic planning and ensure long-term sustainability [15, 35].

4.3. Bursa Malaysia sustainability reporting guide.

The Bursa Malaysia Sustainability Reporting Guide, introduced in 2015, represents a significant step in institutionalizing sustainability reporting in Malaysia, particularly among public-listed companies. The framework was developed to align corporate reporting practices with global sustainability trends while addressing the unique economic, social, and environmental context of Malaysia and the wider Southeast Asian region. The Guide emphasizes three key aspects—Environmental, Economic, and Social (EES)—while embedding governance principles throughout, ensuring that sustainability is integrated into the overall corporate strategy. This holistic approach allows companies to evaluate and disclose issues that are material to their stakeholders, from climate-related risks and resource efficiency to labor practices, community engagement, and economic contributions. By adopting this framework, companies are encouraged to move beyond compliance-driven reporting toward creating meaningful value for both shareholders and society. One of the key strengths of the Bursa Malaysia framework is its emphasis on stakeholder inclusivity, ensuring that companies report on issues most relevant to investors, customers, employees, and regulators. This helps organizations identify sustainability risks and opportunities that may otherwise be overlooked, thereby improving long-term resilience and competitiveness [36, 37]. The Guide also complements global standards such as GRI and TCFD, enabling Malaysian companies to position themselves within international capital markets that increasingly prioritize ESG performance. Moreover, its localized nature reflects the growing recognition that sustainability challenges are context-specific and require tailored solutions. By adopting this framework, companies not only meet Bursa Malaysia’s listing requirements but also signal their commitment to responsible and ethical business practices. This, in turn, strengthens investor confidence, attracts sustainable financing, and enhances corporate reputation. In the long run, the Bursa Malaysia Sustainability Reporting Guide supports the transition toward a more resilient, transparent, and sustainable corporate ecosystem in Malaysia and the region [15, 37].

4.4. SASB.

The SASB, established in 2011, provides a set of standards designed to improve the disclosure of sustainability information that is most relevant to financial performance. Unlike broader ESG frameworks that focus on general sustainability impacts, SASB’s standards are highly industry-specific, covering 77 different industries and identifying the ESG issues most likely to affect financial condition and operating performance. This makes SASB particularly valuable for investors, who rely on clear and comparable data to assess long-term value creation and risk exposure [38, 39]. SASB standards emphasize financial materiality, meaning that companies are expected to disclose only those sustainability issues that directly influence their business operations, revenue, or costs. For example, data security is a material issue in the technology sector, while resource efficiency and waste management are critical in manufacturing. By focusing on financially relevant factors, SASB provides investors with decision-useful information that is directly linked to business performance. Another strength

of SASB lies in its ability to bridge the gap between sustainability reporting and traditional financial reporting, aligning ESG disclosures with the information investors already use in financial decision-making. Increasingly, companies combine SASB with other frameworks such as GRI and TCFD to provide a comprehensive and multi-stakeholder reporting approach. Furthermore, SASB has gained global traction, particularly after merging with the International Integrated Reporting Council (IIRC) to form the Value Reporting Foundation, which has since been consolidated under the ISSB. This consolidation reflects the growing push for harmonized global sustainability standards. For businesses, adopting SASB enhances transparency, strengthens investor relations, and ensures that ESG factors are integrated into strategic and financial planning. Ultimately, SASB helps companies demonstrate accountability while positioning themselves to thrive in markets where ESG performance increasingly drives investment decisions and corporate value [40, 41].

5. The Impacts of ESG Implementation

The adoption of ESG frameworks has generated substantial and measurable impacts across the global business landscape in recent years. Its influence is evident in its near-universal adoption by major corporations; for instance, research indicates that large financial firms in the United States now incorporate ESG scores into their annual disclosures. By 2020, the demand from investors and regulators for detailed non-financial performance data had become a powerful market force. This shift means that robust ESG reporting directly influences a company's ability to secure capital and attract investment. The global significance of ESG is further underscored by the United Nations Global Compact, which leverages ESG principles to track corporate progress towards the SDGs and boasts over 15,000 signatory organizations worldwide [6, 29]. Impacts of ESG Implementation is summarized in Table 3.

Table 3. Impacts of ESG Implementation.

Dimension	Key Focus	Main Practices	Outcomes & Benefits	Ref
Environmental Impacts	Climate change mitigation and sustainable resource use	– Decarbonization through reduced GHG emissions. – Adoption of digital technologies (AI, big data, monitoring tools). – Efficient energy, water, and waste management. – Preservation of biodiversity in industrial activities.	– Reduced carbon footprint – Optimized resource and energy efficiency. – Real-time environmental monitoring. – Protection of ecosystems and biodiversity.	[15, 16, 22]
Social Impacts	Stakeholder well-being, equity, and community relations	– Employee health, safety, and benefits – Fair labor practices in industries (construction). – Strong customer protection and welfare. – Collaboration with suppliers, communities, and regulators.	– Improved employee loyalty and retention. – Stronger community and customer trust. – Positive corporate culture. – Enhanced ability to attract and retain skilled talent.	[1, 4, 6, 21, 22]
Governance Impacts	Corporate oversight, ethics, and accountability	– Financial transparency and ethical conduct. – Board diversity and risk management – Dedicated ESG committees. – Alignment with UN SDGs and global standards.	– Greater investor confidence. – Lower financial and operational risks. – Easier access to capital and financing. – Strengthened long-term resilience and strategic value	[23, 42, 43]

5.1. Environmental impacts.

The environmental pillar of ESG addresses one of the most pressing global issues: climate change driven by carbon emissions from industrial activities, including construction. Implementing an ESG framework provides a structured approach for companies to mitigate their environmental footprint. Specifically, it guides industries in reexamining their operations through the lens of decarbonization—the systematic reduction of greenhouse gas emissions [15, 16]. Integrating ESG practices, particularly in sectors like construction, can lead to significant environmental improvements. The adoption of digital technologies, such as artificial intelligence and big data analytics, is a key example. These tools optimize resource use, enhance energy efficiency, and monitor environmental impact in real-time, offering powerful solutions for protecting the environment. The energy sector, including mining and oil and gas, is already demonstrating how digitalization can drive sustainable development and decarbonization. Ultimately, superior environmental performance under the ESG framework translates into tangible benefits: a reduced carbon footprint, improved water and wastewater management, and the preservation of biodiversity, which is often severely impacted by construction and industrial projects [16, 22].

5.2. Social impacts.

The social pillar evaluates a company's relationships with its internal and external stakeholders, including employees, customers, and communities. Performance is measured through factors such as employee benefits, health and safety records, turnover rates, and customer welfare. These social factors are critical to sustainability, as risks related to people can significantly impact a company's reputation and commercial success [4, 6, 21, 22]. A core component of social responsibility is ensuring employee well-being through fair benefits and rigorous health and safety protocols. In the construction industry, this translates to providing proper allowances, sanitation facilities, and personal protective equipment. Prioritizing these elements fosters employee loyalty, improves community relations, and builds a positive corporate culture. Furthermore, strong social performance enhances a company's ability to attract and retain talent, win customer trust and loyalty, and forge strong, lasting relationships with suppliers and regulators. By cementing the connection between a company and its human capital, the social pillar ensures that sustainable development is inclusive and equitable, making it an indispensable element of the ESG framework [1, 6].

5.3. Governance impacts.

The governance pillar serves as the foundational framework for the entire ESG structure, focusing on the systems and processes that guide corporate direction and control. It assesses criteria such as financial transparency, ethical business conduct, board diversity, and risk management. Effective governance ensures that an organization is run responsibly and accountably, providing the stability needed to pursue long-term environmental and social goals. Implementing a strong governance framework through ESG involves establishing clear policies that balance compliance with strategic performance. This requires a well-defined relationship between a company's board and its management, with each understanding of their

distinct roles. Best practices suggest establishing a dedicated ESG committee responsible for overseeing strategy, conducting regular assessments, and ensuring alignment with global standards like the UN SDGs [42, 43]. The primary output of robust governance is financial transparency, which is a key driver of investor confidence. Transparent reporting allows investors to clearly see a company's financial health and operational integrity, making it a sign of dedication to sustainability and ethical practices. The benefits extend beyond investor appeal; strong governance leads to decreased costs through improved risk management and provides easier access to capital and banking facilities, as seen in the financial sector. Ultimately, sound governance is not just about oversight—it is a strategic asset that underpins long-term resilience and value creation [23, 43].

6. Future Study

While the current review highlights the critical role of ESG frameworks in promoting sustainable development, several gaps remain that warrant further exploration. First, more research is needed to harmonize global ESG reporting frameworks, as the coexistence of GRI, SASB, TCFD, and regional guidelines such as Bursa Malaysia creates challenges in comparability and standardization. Future studies should investigate pathways toward greater integration and interoperability among these frameworks to reduce reporting fatigue and enhance global consistency. Second, quantitative methods for measuring ESG impacts remain underdeveloped. While qualitative disclosures are valuable, the lack of universally accepted metrics hinders effective benchmarking and cross-sectoral analysis. Research focusing on advanced analytical tools, such as artificial intelligence, blockchain, and big data analytics, could improve the accuracy, transparency, and real-time monitoring of ESG performance [44–46]. Additionally, the role of ESG in emerging markets remains underexplored. Many studies disproportionately focus on developed economies, overlooking unique challenges in developing regions, such as limited regulatory enforcement, resource constraints, and differing cultural perceptions of sustainability. Comparative cross-country studies could provide valuable insights into how ESG practices can be adapted to diverse socio-economic contexts. Furthermore, future work should assess the long-term financial implications of ESG integration, especially how robust ESG performance correlates with firm resilience in times of global crises, such as pandemics or economic recessions. Finally, more attention should be directed toward the social pillar, which often receives less emphasis compared to environmental and governance aspects. This includes evaluating how ESG initiatives can address inequality, labor rights, and community development at a global scale. Addressing these research gaps will not only advance academic knowledge but also provide practical guidance for policymakers, businesses, and investors seeking to align corporate strategies with the SDGs [6, 24, 47].

7. Conclusion

The growing prominence of ESG frameworks reflects a fundamental transformation in the way businesses operate, measure success, and engage with stakeholders. This review has highlighted the critical importance of ESG in promoting sustainable development, not only by improving corporate accountability but also by reshaping investment strategies and regulatory expectations worldwide. The widespread adoption of global reporting frameworks such as the GRI, TCFD, SASB, and region-specific guidelines like the Bursa Malaysia Sustainability

Reporting Guide illustrates the momentum toward integrating sustainability into mainstream corporate practices. The environmental dimension of ESG has proven especially urgent in the context of climate change, with companies increasingly leveraging digital technologies to reduce emissions, optimize resource use, and protect biodiversity. Similarly, the social pillar emphasizes the importance of workforce well-being, stakeholder engagement, and equitable development, elements that are critical for long-term corporate resilience. Governance, as the foundation of ESG, ensures transparency, ethical conduct, and sound decision-making processes that ultimately secure investor trust and long-term value creation. Together, these pillars demonstrate that ESG is no longer a voluntary corporate gesture but a strategic necessity. The evidence presented shows that ESG adoption enhances investor confidence, facilitates access to capital, and strengthens corporate resilience against global risks, while also aligning companies with the United Nations SDGs. Moving forward, ESG will continue to play a pivotal role in shaping global markets, making it an indispensable framework for sustainable growth, ethical responsibility, and long-term corporate success.

Acknowledgment

The authors would like to acknowledge the valuable insights from previous studies and frameworks that informed this review.

Author Contributions

All authors contributed equally to the conceptualization, writing, and revision of this manuscript.

Competing Interests

The authors declare no competing financial or non-financial interests.

Data Availability

No new data was generated or analyzed in this study. All referenced materials are publicly available and properly cited.

Reference

- [1] Xue, A.; Yang, G.; Wang, H. (2025). The Impact of Environmental, Social, and Governance (ESG) on the Green Development of Listed Companies in China's Agricultural and Forestry Industries. *Sustainability*, 17, 4648. <https://doi.org/10.3390/su17104648>.
- [2] Zhao, D.; Ngan, S.L.; Jamil, A.H. (2025). When ESG Meets Uncertainty: Financing Cost Effects Under Regulatory Fragmentation and Rating Divergence. *Systems*, 13, 465. <https://doi.org/10.3390/systems13060465>.
- [3] Vijayagopal, P.; Jain, B.; Ayinippully Viswanathan, S. (2024). Regulations and Fintech: A Comparative Study of the Developed and Developing Countries. *Journal of Risk and Financial Management*, 17, 324. <https://doi.org/10.3390/jrfm17080324>.
- [4] Glova, J.; Panko, M. (2025). The Effects of Environmental, Social, and Governance Factors on Financial Performance and Market Valuation in the European Automotive Industry. *International Journal of Financial Studies*, 13, 82. <https://doi.org/10.3390/ijfs13020082>.

- [5] Wu, S.; Li, X.; Du, X.; Li, Z. (2022). The Impact of ESG Performance on Firm Value: The Moderating Role of Ownership Structure. *Sustainability*, 14, 14507. <https://doi.org/10.3390/su142114507>.
- [6] Shmelev, S.E.; Gilardi, E. (2025). Corporate Environmental, Social, and Governance Performance: The Impacts on Financial Returns, Business Model Innovation, and Social Transformation. *Sustainability*, 17, 1286. <https://doi.org/10.3390/su17031286>.
- [7] Shalhoob, H. (2025). ESG Disclosure and Financial Performance: Survey Evidence from Accounting and Islamic Finance. *Sustainability*, 17, 1582. <https://doi.org/10.3390/su17041582>.
- [8] Almaqtari, F.A.; Elsheikh, T.; Tawfik, O.I.; Youssef, M.A.E.-A. (2022). Exploring the Impact of Sustainability, Board Characteristics, and Firm-Specifics on Firm Value: A Comparative Study of the United Kingdom and Turkey. *Sustainability*, 14, 16395. <https://doi.org/10.3390/su142416395>.
- [9] Fuadah, L.L.; Mukhtaruddin, M.; Andriana, I.; Arisman, A. (2022). The Ownership Structure, and the Environmental, Social, and Governance (ESG) Disclosure, Firm Value and Firm Performance: The Audit Committee as Moderating Variable. *Economies*, 10, 314. <https://doi.org/10.3390/economies10120314>.
- [10] Afolabi, H.; Ram, R.; Rimmel, G. (2022). Harmonization of Sustainability Reporting Regulation: Analysis of a Contested Arena. *Sustainability*, 14, 5517. <https://doi.org/10.3390/su14095517>.
- [11] Senanayake, M.; Harymawan, I.; Dorfleitner, G.; Lee, S.; Rhee, J.H.; Ok, Y.S. (2024). Toward More Nature-Positive Outcomes: A Review of Corporate Disclosure and Decision Making on Biodiversity. *Sustainability*, 16, 8110. <https://doi.org/10.3390/su16188110>.
- [12] Baratta, A.; Cimino, A.; Longo, F.; Solina, V.; Verteramo, S. (2023). The Impact of ESG Practices in Industry with a Focus on Carbon Emissions: Insights and Future Perspectives. *Sustainability*, 15, 6685. <https://doi.org/10.3390/su15086685>.
- [13] Jităreanu, A.F.; Mihăilă, M.; Alecu, C.-I.; Robu, A.-D.; Ignat, G.; Costuleanu, C.L. (2022). The Relationship between Environmental Factors, Satisfaction with Life, and Ecological Education: An Impact Analysis from a Sustainability Pillars Perspective. *Sustainability*, 14, 10679. <https://doi.org/10.3390/su141710679>.
- [14] Michalski, D. (2024). Operationalization of ESG-Integrated Strategy Through the Balanced Scorecard in FMCG Companies. *Sustainability*, 16, 9174. <https://doi.org/10.3390/su16219174>.
- [15] Pratama, A.; Afiah, N.N.; Ismail, R.F. (2025). Climate Change Management and Firm Value: Insights from Southeast Asia Markets (A Survey of Public Companies in Indonesia, Malaysia and Thailand for the 2022–2023 Period). *Sustainability*, 17, 4767. <https://doi.org/10.3390/su17114767>.
- [16] El-Hakim, Y.; AbouZeid, M.N. (2024). Towards Mitigating Climate Change Negative Impact: The Role of Regulations and Governance in the Construction Industry. *Sustainability*, 16, 6822. <https://doi.org/10.3390/su16166822>.
- [17] Solaymani, S.; Botero, J. (2025). Reducing Carbon Emissions from Transport Sector: Experience and Policy Design Considerations. *Sustainability*, 17, 3762. <https://doi.org/10.3390/su17093762>.
- [18] Kušnířová, D.; Bubelíny, O.; Ďuriřová, M. (2024). Value Management: Enterprises' Interest in Stakeholders and Its Impact on Creating Sustainable Relationships with Suppliers and Buyers. *Sustainability*, 16, 7148. <https://doi.org/10.3390/su16167148>.
- [19] Chenavaz, R.Y.; Couston, A.; Heichelbech, S.; Pignatelli, I.; Dimitrov, S. (2023). Corporate Social Responsibility and Entrepreneurial Ventures: A Conceptual Framework and Research Agenda. *Sustainability*, 15, 8849. <https://doi.org/10.3390/su15118849>.
- [20] Ceresia, F. (2025). The Contribution of Sustainable Human Resource Management to International Trade Governance. *Sustainability*, 17, 7550. <https://doi.org/10.3390/su17167550>.
- [21] Pang, Q.; Fang, M.; Wang, L.; Mi, K.; Su, M. (2023). Increasing Couriers' Job Satisfaction through Social-Sustainability Practices: Perceived Fairness and Psychological-Safety Perspectives. *Behavioral Sciences*, 13, 125. <https://doi.org/10.3390/bs13020125>.

- [22] Tamošiūnas, A. (2024). Corporate Governance Implications for Sustainable Performance: Focus on Leading Energy Producers in Denmark, Estonia, Latvia, Lithuania, and Sweden. *Sustainability*, 16, 6402. <https://doi.org/10.3390/su16156402>.
- [23] Shanikat, M.; Aldabbas, M.M. (2025). Perception of Corporate Governance Factors in Mitigating Financial Statement Fraud in Emerging Markets: Jordan Experience. *Journal of Risk and Financial Management*, 18, 430. <https://doi.org/10.3390/jrfm18080430>.
- [24] Ali, N.B.M.; Ali Hussin, H.A.A.; Mohammed, H.M.F.; Mohmmmed, K.A.A.H.; Almutiri, A.A.S.; Ali, M.A. (2025). The Effect of Environmental, Social, and Governance (ESG) Disclosure on the Profitability of Saudi-Listed Firms: Insights from Saudi Vision 2030. *Sustainability*, 17, 2977. <https://doi.org/10.3390/su17072977>.
- [25] Cheong, T.S.; Liu, S.; Ma, N.; Han, T. (2025). The Impact of Public Environmental Concern on Corporate ESG Performance. *Journal of Risk and Financial Management*, 18, 82. <https://doi.org/10.3390/jrfm18020082>.
- [26] Passas, I.; Ragazou, K.; Zafeiriou, E.; Garefalakis, A.; Zopounidis, C. (2022). ESG Controversies: A Quantitative and Qualitative Analysis for the Sociopolitical Determinants in EU Firms. *Sustainability*, 14, 12879. <https://doi.org/10.3390/su141912879>.
- [27] Loko, A.G.S.; Schiehl, E. (2025). ESG Policy–Practice Decoupling: A Measurement Framework and Empirical Validation. *Sustainability*, 17, 1203. <https://doi.org/10.3390/su17031203>.
- [28] Bejtush, A.; Klungseth, N.J. (2022). Does It Pay to Deliver Superior ESG Performance? Evidence from US S&P 500 Companies. *Journal of Global Responsibility*, 13(4), 421–449. <https://doi.org/10.1108/JGR-01-2022-0006>.
- [29] Matuszak, Ł.; Różańska, E.; Szczepankiewicz, E.I. (2025). Assessment of the Compliance of Environmental Disclosures by Energy Companies Using GRI Standards with European Sustainability Reporting Standards: A Case Study. *Sustainability*, 17, 3380. <https://doi.org/10.3390/su17083380>.
- [30] Mihai, F.; Aleca, O.E. (2023). Sustainability Reporting Based on GRI Standards within Organizations in Romania. *Electronics* 12, 690. <https://doi.org/10.3390/electronics12030690>.
- [31] Areta Hiziroglu, O.; Dogan, O.A. (2025). Framework for Sustainability Performance Measurement Through Process Mining: Integration of GRI Metrics in Operational Processes. *Systems* 13, 547. <https://doi.org/10.3390/systems13070547>.
- [32] Domínguez-Quiñones, M.; Aliende, I.; Escot, L. (2025). Assessment of TCFD Voluntary Disclosure Compliance in the Spanish Energy Sector: A Text Mining Approach to Climate Change Financial Disclosures. *World* 6, 92. <https://doi.org/10.3390/world6030092>.
- [33] Principale, S.; Pizzi, S. (2023). The Determinants of TCFD Reporting: A Focus on the Italian Context. *Administrative Sciences* 13, 61. <https://doi.org/10.3390/admsci13020061>.
- [34] Davutluoğlu, O.; Yavuzdeğer, A.; Esenboğa, B.; Demirdelen, Ö.; Tümay Ateş, K.; Demirdelen, T. (2024). Carbon Emission Analysis and Reporting in Urban Emissions: An Analysis of the Greenhouse Gas Inventories and Climate Action Plans in Sarıçam Municipality. *Sustainability* 16, 4184. <https://doi.org/10.3390/su16104184>.
- [35] Abdul Latif, R.; Taufil Mohd, K.N.; Kamardin, H.; Mohd Ariff, A.H. (2024). Determinants of Sustainability Disclosure Quality among Plantation Companies in Malaysia. *Sustainability* 15, 3799. <https://doi.org/10.3390/su15043799>.
- [36] Pranugrahaning, A.; Donovan, J.D.; Topple, C.; Masli, E.K. (2023). Exploring Corporate Sustainability in the Insurance Sector: A Case Study of a Multinational Enterprise Engaging with UN SDGs in Malaysia. *Sustainability* 15, 8609. <https://doi.org/10.3390/su15118609>.
- [37] Huston, S. (2025). Sustainability Accounting and Reporting: An Ablative Reflexive Thematic Analysis of Climate Crisis via Conservative or Radical Reform Paradigms. *Sustainability* 17, 4943. <https://doi.org/10.3390/su17114943>.

- [38] Wang, J.-B.; Wang, G.-H.; Ou, C.-Y. (2023). The Key Factors for Sustainability Reporting Adoption in the Semiconductor Industry Using the Hybrid FRST-PSO Technique and Fuzzy DEMATEL Approach. *Sustainability* 15, 1929. <https://doi.org/10.3390/su15031929>.
- [39] Camargo, M.C.; Sarsfield, R.; Kanninen, M.; Cashore, T. (2023). The Role of Private Philanthropy in Sustainability Standards Harmonization: A Case Study. *Sustainability* 15, 10635. <https://doi.org/10.3390/su151310635>.
- [40] Carmo, C.; Correia, I.; Leite, J.; Carvalho, A. (2023). Towards the Voluntary Adoption of Integrated Reporting: Drivers, Barriers, and Practices. *Administrative Sciences* 13, 148. <https://doi.org/10.3390/admsci13060148>.
- [41] Yucel, M.; Yucel, S. Environmental, Social, and Governance (ESG) Dynamics in the Energy Sector: Strategic Approaches for Sustainable Development. *Energies* 17, 6291 (2024).
- [42] Moussa, A.S.; Elmarzouky, M.; Shohaieb, D. (2024). Green Governance: How ESG Initiatives Drive Financial Performance in UK Firms? *Sustainability* 16, 10894. <https://doi.org/10.3390/su162410894>.
- [43] Yao, K.-C.; Lai, C.-C.; Shyr, W.-J.; Chou, D.-F.; Huang, K.-M. (2025). Exploring Key Factors Influencing ESG Commitment: Evidence from Taiwanese Listed Companies. *Sustainability* 17, 6208. <https://doi.org/10.3390/su17136208>.
- [44] Dincer, B.; Dincer, C. (2024). Insights into Sustainability Reporting: Trends, Aspects, and Theoretical Perspectives from a Qualitative Lens. *Journal of Risk and Financial Management* 17, 68. <https://doi.org/10.3390/jrfm17020068>.
- [45] Makkar, M.K.; Bhat, B.A.; Showkat, M.; Mabrouk, F. (2025). The ESG Paradox: Risk, Sustainability, and the Smokescreen Effect. *Sustainability* 17, 7539. <https://doi.org/10.3390/su17167539>.
- [46] Gonzaga, B.R.; Klotzle, M.C.; Brugni, T.V.; Rakos, I.-S.; Cioca, I.C.; Barbu, C.-M.; Cucerzan, T. (2024). The ESG Patterns of Emerging-Market Companies: Are There Differences in Their Sustainable Behavior after COVID-19? *Sustainability* 16, 676. <https://doi.org/10.3390/su16020676>.



© 2025 by the authors. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).