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Does Sustainability Auditing Lead to Enhanced Corporate Governance, Environmental Performance, and Financial Outcomes? Empirical Evidence From High-Impact Industries

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ABSTRACT

This study employs hierarchical regression modelling on a survey of 550 firms from Nigeria and Ghana to examine the impact of sustainability auditing on corporate governance, environmental performance, and financial outcomes of high-impact industries. Our findings reveal that internal sustainability auditing significantly enhances environmental performance, regulatory compliance, corporate governance transparency, and accountability. Additionally, external sustainability auditing positively influences firms' financial performance and long-term value. Notably, we identify cross-country variations: Internal sustainability auditing has a stronger effect on environmental performance and corporate governance in Ghana, whereas external audits exhibit a greater impact on financial performance and long-term firm value in Nigeria. Moreover, industry-specific insights indicate that internal audits are particularly influential in improving environmental performance within the mining sector while they play a critical role in strengthening corporate governance within the oil and gas industry. The study underscores the importance of sustainability auditing in corporate governance frameworks for promoting environmental and financial sustainability in high-impact industries, providing valuable insights for policymakers and corporate leaders.

1 | Introduction

High-impact industries including Sub-Saharan Africa (SSA), particularly the mining, oil and gas, and manufacturing sectors are under increasing pressure from regulators, investors, and civil society to improve environmental stewardship, governance accountability, and sustainability (Olawumi and Chan 2022; Suska 2021). As the most resource-intensive sectors, they are frequently associated with significant carbon emissions, widespread ecological degradation, and consequent social unrest (Mohsin et al. 2021). In countries like Ghana and Nigeria, although these industries are vital for economic development, their potential is constrained by institutional inefficiencies, weak regulatory enforcement, and a lack of public trust. This paradox raises a critical question: How can high-impact industries in SSA, particularly Ghana and Nigeria, leverage sustainability auditing (SA) to improve their corporate governance, environmental performance, and financial outcomes? Addressing this question is central to understanding the role of SA in driving corporate reform and sustainable development in some of Africa's most environmentally significant sectors.

SA has emerged as a strategic mechanism strengthening ESG performance by providing independent, systematic evaluations of corporate sustainability practices (Hariyani et al. 2025). These audits help organizations identify governance weaknesses,

track progress on sustainability goals, and facilitate continuous improvement (Masoud 2025; Flayyih et al. 2024; Hariyani et al. 2025). SA go beyond mere regulatory compliance, actively enhancing corporate governance transparency, mitigating environmental effects, and drawing socially conscious investments (Wang et al. 2015; Ngu et al. 2020; Wang 2023). Further, emerging evidence highlights the critical role of SA in bridging ESG targets with circular economy (CE) practices, particularly high-impact sectors (Hariyani et al. 2025; Marrucci and Daddi 2022; Hassan et al. 2021). In a developing country like SSA, where regulatory enforcement and ESG culture remain weak, SA offers a structured pathway to operationalize ESG-CE alignment. Agyemang et al. (2025) highlight eco-innovation and corporate governance as key facilitators for integration, particularly within resource-intensive industries. For instance, mining and oil companies in Ghana and Nigeria integrating CE objectives into sustainability audits have achieved better waste management, reduced emissions, and improved investor relations, indicating a potential for systemic corporate reform through these audits.

In addition, SA plays a pivotal role in enhancing accountability by systematically reducing the information asymmetry between management and stakeholders (Zhou et al. 2022). By providing reliable data to oversee environmental performance, SA can provide transparent metrics related to carbon emissions, energy use, waste generation, and resource efficiency (Hariyani et al. 2025). These insights organizations to effectively monitor environmental risks, evaluate managerial decisions, and ensure alignment with ESG commitments. Moreover, the SA establishes internal feedback mechanism that support continuous environment improvement. Firms use audit results as performance benchmarks for firms, contributing to reduced environmental management costs, enhanced operational efficiency, and the advancement of sustainability (Hariyani et al. 2025; Hassan et al. 2021). Financially, SA can positively influence firm value by lowering capital costs, improving access to sustainability-linking financing, and increasing investor confidence in long term strategy (Zhang et al. 2023; Le and Nguyen-Phung 2024). Evidence suggest that investors prefer to support organizations with measurable sustainability impacts, especially in high-risk sectors where ESG credibility influences market positioning and risk perception (Wang 2023; Ngu et al. 2020).

However, empirical research remains scarce on how sustainability audits support ESG–CE alignment, particularly in high-impact industries across Sub-Saharan Africa. Prior studies have largely focused on ESG disclosure and general sustainability performance (Khatri and Kjærland 2023; Al-Shaer and Hussainey 2022), with limited exploration of the role of SA in enhancing transparency, compliance, and long-term value creation, despite growing emphasis on sustainability reporting and assurance (Schaltegger and Burritt 2018; Lozano et al. 2015; Zahid and Ghazali 2017). This study addresses these gaps by exploring the dynamic nexus between SA, corporate governance, and environmental and financial performance in high-impact industries in Ghana and Nigeria, two resource-rich, industrializing nations grappling with sustainability and governance challenges. We aim to examine three interrelated questions:

RQ1. To what extent do sustainability audits improve the environmental performance of companies by reducing carbon emissions and improving resource efficiency?

RQ2. How does SA influence corporate governance transparency and accountability by increasing ESG disclosure and improving governance practices?

RQ3. What is the impact of external sustainability audit on financial performance and long-term value creation through increased stakeholder trust and market positioning?

Ghana and Nigeria provide compelling case contexts notable for their expanding industrial sectors, substantial impact on regional GDP, and the mounting need to conform to international sustainability standards. However, both countries face persistent institutional and governance challenges, including bureaucratic inefficiency, corruption, and weak enforcement mechanisms that hinder the effectiveness of ESG frameworks (Osuma et al. 2024). In such governance-constrained environments, SA emerges as a potentially transformative mechanism, offering structured pathways to improve environmental compliance, enhance corporate governance accountability, and support long-term financial outcomes. Although general evidence underscores SA's role in strengthening sustainability performance (Hariyani et al. 2025), its application in the specific contexts of Ghana and Nigeria could provide more targeted benefits by reinforcing regulatory oversight, enhancing disclosure practices, and facilitating stakeholder engagement. By embedding robust auditing practices into corporate governance frameworks, firms in these contexts can build stakeholder trust, attract impact-oriented investors, and better align with global sustainability expectations (Marrucci and Daddi 2022; Hassan et al. 2021; Boateng 2024; Eboh 2024).

To empirically examine these relationships, we employ a hierarchical regression model utilizing survey data from 550 firms across Ghana and Nigeria high-impact firms. Our findings show that internal SA positively influences environmental performance, environmental compliance, and both corporate governance transparency and accountability. We also find that external SA (ESA) positively influences financial performance and long-term firm value. Notably, the impact of internal SA on environmental performance and corporate governance is stronger in Ghana, whereas ESA exerts a greater influence on financial performance and long-term value in Nigeria. Sector-specific results that internal sustainability audit has the most significant environmental impact in mining and the strongest in governance effect in oil and gas, whereas ESA drive financial outcomes most in construction firms. Our findings underscore the importance of embedding SA frameworks within corporate governance structures to foster both environmental and economic sustainability in high-impact industries.

We contribute to the literature in four folds. First, while previous research links sustainability reporting to improved environmental performance (Khatri and Kjærland 2023; Al-Shaer and Hussainey 2022), few studies explore the distinct role of SA in reducing emissions and optimizing resource use, particularly in high-impact industries (Zhang et al. 2023). We address this by confirming that SA enhances

both environmental performance and regulatory compliance in high-impact industries, reducing carbon emissions, improving resource efficiency, and optimizing energy use. Second, although sustainability initiatives are associated with transparency and competitiveness, their long-term impact on governance accountability and transparency remains underexplored especially Africa's high-impact sectors (Chen et al. 2020; Pangastuti 2023). Our findings provide new empirical evidence from Ghana and Nigeria, where institutional weakness, regulatory gaps, and corruption often undermine governance effectiveness. We show that SA enhances governance transparency and accountability, even in these challenging contexts.

Third, although much of the literature relies on secondary data, we use primary data to assess how internal and external sustainability audits (ESA) influence ESG and financial outcomes (Le and Nguyen-Phung 2024; Nguyen et al. 2021; Zhou et al. 2022). This allows us to explore the underexplored effect of ESA on financial performance and long-term value. Our findings confirm that ESA strengthens firm value and financial outcomes by reinforcing governance practices and environmental responsibility in SSA. Finally, we develop a multi-theoretical framework grounded in the resources-based view, agency, stakeholder, legitimacy, and accountability theories. This framework explains how high-impact firms in emerging economies leverage SA navigate institutional weaknesses, respond to stakeholder pressures, and improve ESG performance. Our findings offer both theoretical and practical guidance for implementing ESG frameworks in resource-intensive sectors operating under governance constraints.

We structure our paper as follows. Section 2 discusses the background, followed with Section 3 presenting theoretical framework, existing literature, and formulates our hypotheses. Section 4 details our methodology and data, whereas Section 5 presents the results and discussions. Section 6 concludes our research.

2 | Background: Sustainability Practices, Auditing, and Corporate Governance Reforms in Nigeria and Ghana

In recent years, Nigeria and Ghana have significantly enhanced their sustainability practices, acknowledging the critical role of ESG factors in their economic goals (Bukari et al. 2024; Appiah-Konadu et al. 2022). However, challenges in SA and corporate governance persist, emphasizing the crucial need for sustainability integration into corporate governance frameworks (Osei et al. 2019). To improve corporate governance in Nigeria and Ghana, it is crucial to enhance board structure, business ethics, and incorporate sustainability considerations into decision-making processes.

Although both nations have made progress in sustainability, their effectiveness is hindered by weak auditing and inconsistent corporate governance, which could be enhanced by integrating governance with sustainability objectives (Coleman and Wu 2021). In Nigeria, the country's GDP dependence on the oil and gas industry significantly impacts sustainability standards, leading to environmental issues such as gas flaring, oil spills, and deforestation (James et al. 2022). Despite initiatives to stop environmental deterioration like the establishment of the National Environmental Standards and Regulations Enforcement Agency, enforcement is still lacking because of corruption and an absence of funding. In contrast, Ghana is actively integrating sustainability into its national development, with notable advancements in renewable energy, mining sustainability, and climate change mitigation (Nyasapoh et al. 2022). For example, the government has prioritized reducing carbon emissions and actively participated in global environmental agreements like the Paris Climate Accord. However, challenges exist with the environment and local communities being threatened by illegal practices like "Galamsey" in the mining sector. Additionally, the effectiveness of SA in Nigeria is often inadequate due to auditors' limited specialized skills and insufficient resources to comprehensively evaluate ESG performance (Ahmad et al. 2025). The lack of standardized audit frameworks and weak regulation enforcement further undermines the reliability and impact of sustainability audits.

Although the SEC and Nigeria Stock Exchange (NSE) have made voluntary efforts to promote sustainability reporting, these practices have been inconsistent (Adejugbe 2024). The country's corporate landscape lacks mandatory sustainability reporting, with many firms providing selective, non-standardized disclosures about their environmental and social impacts. Conversely, Ghana has made more strides in implementing sustainability audits as businesses participate more in ESG reporting. However, they are often voluntary, leading to discrepancies in the quality and depth of sustainability reports due to the absence of a consistent audit standard. The Ghana Stock Exchange (GSE) has introduced guidelines for voluntary sustainability reporting, but many firms view it as a public relations tool rather than a rigorous compliance practice.

Recently, both countries have focused on corporate governance reforms, particularly in response to corporate scandals and financial crises (Ntim et al. 2013; Adu 2022). For Nigeria, corporate governance has undergone significant reforms following the enactment of the Code of Corporate Governance, providing guidelines on board structure, executive compensation, and internal controls (Adu et al. 2023). However, the country's corporate governance remains a challenge due to persistent corruption, absence of transparency, and weak regulation enforcement. Nigerian government and private sector face challenges in institutional and regulatory environments, despite increasing recognition of sustainability integration in corporate governance (Erin et al. 2022). Meanwhile, the Ghana Corporate Governance Code aims to enhance business ethics, board composition, and shareholder rights, promoting transparency and accountability, yet there is room for improvement in integrating sustainability (Adu et al. 2023).

Despite the growing recognition of the link between good governance and sustainable development, the application of sustainability principles within corporate governance frameworks in both countries remains inconsistent. Notably, both countries are positioned to enhance SA and corporate governance to promote sustainable development in the long term. In Nigeria, the

urgent need for a robust regulatory framework for sustainability reporting and auditing is highlighted, requiring capacity building, clearer guidelines, and stronger enforcement mechanisms. Meanwhile, Ghana's sustainability reporting credibility could be improved by implementing standardized practices and explicit regulations on mandatory disclosures, despite increasing engagement with sustainability audits.

3 | Theoretical Framework and Hypothesis Development

We utilize stakeholder theory (ST), legitimacy theory (LT), accountability theory (AT), and resource-based view (RBV) to establish the relationship between SA, environmental performance, corporate governance, and financial performance. First, ST highlights the importance of managing relationships with diverse stakeholder groups, each with unique and often conflicting demands (Freeman and Reed 1983; Jones 1995). ST suggests that organizations should implement practices like SA to meet stakeholder expectations, resolve conflicts, and boost trust (Gao and Zhang 2006; Jan et al. 2021). According to Dam and Scholtens (2012), sustainability audits provide a structured method for organizations to assess and assess their environmental and social impacts, ensuring they align with stakeholder priorities. Engaging in SA allows organizations to show their responsiveness to climate change and ethical governance, which helps reduce reputational risks and improve stakeholder relationships. ST underlines that proactive sustainability initiatives, supported by auditing processes, can minimize operational disruptions and foster long-term stakeholder loyalty. For instance, audit findings can help implement environmental practices, demonstrate accountability and transparency, and foster a cycle of social responsibility and competitive advantage.

Second, LT underscores the importance of organizations aligning their actions with societal norms, values, and expectations to maintain legitimacy and ensure long-term survival (Suchman 1995; Crossley et al. 2021). In corporate governance, LT states that sustainability audits enhance transparency, accountability, and ethical practices, fostering trust and improving governance credibility (O'donovan 2002). Regular audits help organizations comply with environmental regulations and societal expectations, addressing carbon emissions and resource depletion (Deegan 2019; Deegan et al. 2002). This not only enhances corporate legitimacy but also fosters public trust and strengthens the social license to operate. LT also suggests these audits attract socially conscious investors, boost financial stability, and enhance market positioning by signaling legitimacy and reducing risk perceptions (Clarkson et al. 2008).

Meanwhile, AT underlines the importance of organizations providing accurate and transparent information to stakeholders about their actions, particularly in addressing societal and environmental impacts (Gray et al. 2001). AT underscores that transparency in audit practices enhances internal accountability and strengthens external trust, particularly in high-impact industries, by demonstrating their commitment to sustainability. Regular audit processes enable companies to identify sustainability gaps, set measurable benchmarks, and track progress, thereby meeting stakeholder expectations for ethical and responsible behavior (Unerman and O'dwyer 2006). Moreover, AT suggests that transparent sustainability audits can decrease uncertainty, boost stakeholder confidence, attract socially conscious investors, and enhance financial performance (Bebbington et al. 2007), promoting ethical governance and long-term value creation by fostering operational and external accountability.

Finally, RBV advocates that unique, rare, and inimitable resources are vital for gaining a competitive advantage and enhancing a firm's performance (Barney 1991). A SA highlights the significance of environmental and social resources in achieving a sustainable competitive advantage, aiding resource optimization, identifying inefficiencies, and reducing waste and emissions (Hart 1995). RBV highlights the strategic significance of aligning sustainability initiatives with emerging market trends, such as sustainability audits, to capitalize on CE opportunities and develop innovative practices. SA enhances organizational resilience and competitiveness by improving resource efficiency, meeting increased demand and contributing to environmental and social benefits.

3.1 | SA and Environmental Performance

According to ST, firms must consider the interests and expectations of various stakeholder groups, including regulatory bodies, local communities, and consumers (Jones 1995). Stakeholders with their unique concerns significantly influence corporate practices, especially in high-impact industries with substantial environmental impacts (Gold et al. 2022). SA, as a vital tool for managing environmental performance in industries, ensures firms align their operations with stakeholder demands for improved environmental responsibility and accountability by evaluating a firm's ESG practices and performance against recognized sustainability criteria, frameworks, and standards (Coyne 2006; Hazaea, Tabash, et al. 2021). Regular audits aid organizations in identifying carbon emissions and resource inefficiencies, enabling them to adjust sustainability goals and meet social and environmental standards through corrective actions. Additionally, SA helps firms monitor environmental progress, optimize energy consumption, reduce waste, and enhance resource efficiency, fostering stronger stakeholder relationships (Saeed and Cek 2024). SA promotes environmental sustainability via resource optimization and waste reduction, which improves operational efficiency and enhances long-term competitiveness for firms focused on sustainability (Barney 1991).

Recently, studies emphasized the role of sustainability reporting and environmental performance management in advancing sustainable business practices (Schaltegger and Burritt 2018; Lozano et al. 2015; Zahid and Ghazali 2017). Moreover, evidence from advanced economies indicates a decoupling of economic growth from carbon emissions, exhibiting an inverted U-shaped relationship (Saglam et al. 2025). This indicates that achieving both development and emission reductions is feasible, reinforcing the role of SA as a practical tool in decarbonization strategies, especially in high-impact sectors. However, research on the impact of SA on environmental performance, especially in high-impact industries, is limited.

H1. *SA positively influences the environmental performance of companies in high-impact industries by reducing carbon emissions and improving resource efficiency.*

3.2 | SA and Regulatory Compliance

LT suggest that organizations seek to align their actions with societal norms, regulations, and stakeholders expectations to maintain legitimacy and avoid sanctions (Suchman 1995). In this light, SA serves as a mechanism's mechanism for regulatory alignment by systematically tracking and verifying environmental performance and (Deegan et al. 2002). Regular audits assist firms in identifying compliance gaps and managing regulatory risks, which helps prevent violations, protect reputation, and avoid legal penalties.

Prior studies have shown that SA contributes to improved legal compliance and reduced regulatory risk. For example, firms with regular sustainability audits demonstrate fewer environmental standard violations (Desimone et al. 2021). Zhang et al. (2023) found that continuous auditing helps firms adapt more effectively to changing regulatory frameworks. Yet, the literature highlights a lack of extensive research linking sustainability audit frequency to measurable outcomes. Bridging this gap is essential for understanding how continuous auditing influences firms' effectiveness in navigating complex regulatory environments. In Ghana and Nigeria's high-impact sectors, like oil and gas and mining, environmental regulations exist, but enforcement is uneven due to institutional weaknesses (Adegbite 2015). Consequently, SA can establish self-regulatory mechanisms to ensure compliance with local and international environmental standards, particularly in areas with weak formal enforcement.

H2. *Companies that regularly conduct sustainability audits demonstrate better compliance with environmental regulations than those that do not.*

3.3 | SA and Corporate Governance Transparency

Global organizations are prioritizing corporate governance transparency and accountability, leading to increased demand for SA and assurance standards (Silvola and Vinnari 2021; Hazaea, Zhu, et al. 2021). AT suggests that managers may neglect stakeholder interests (Gray et al. 2001). The introduction of transparency mechanisms such as SA can help reduce information asymmetry and improve oversight (Wang and Zeng 2024). SA supports ESG data disclosure to enhance corporate transparency and accountability, helping firms identify initiatives, ensure compliance, manage risks, demonstrate ethical governance, build trust, protect reputation, and strengthen stakeholder relationships (Del Giudice and Rigamonti 2020; Rakipi and D'onza 2024; Desimone et al. 2021). LT argues that organizations maintain legitimacy by aligning with societal norms and expectations (Suchman 1995), a goal supported by SA, which strengthens governance by evaluating practices, addressing performance gaps, and reinforcing social alignment.

Research shows that sustainability activities and disclosure can advance governance transparency and firm competitiveness (Alshbili et al. 2021; Hassan et al. 2020; Chen et al. 2020). For instance, studies suggest that sustainability audits improve governance transparency by enhancing the quality and scope of ESG disclosures (Yang and Basile 2021; Akeem et al. 2020). Similarly, Pangastuti (2023) emphasizes that SA enhances internal governance and controls while boosting stakeholders' trust.

In high-impact industries in Ghana and Nigeria, issues such as weak board oversight and limited corporate transparency persist (Agyemang et al. 2020; Amoako, Amoako, et al. 2023). In such contexts, SA can serve as a trust-enhancing mechanism, demonstrating a firm's commitment to ethical and transparent governance practices. Notably, studies on SA in high-impact sectors like manufacturing, mining, and energy remain limited (Saeed and Cek 2024; Imasiku et al. 2020; Swann and Deslatte 2019). Moreover, prior studies highlight the need for further exploration of SA's effects on governance transparency and accountability in developing nations with governance challenges, prompting the following hypothesis:

H3. *SA significantly enhances corporate governance transparency by increasing the disclosure of environmental, social, and governance practices.*

3.4 | SA and Corporate Governance Accountability

Corporate governance accountability refers to an organization's responsibility to act ethically, manage risks, and justify decisions to stakeholders. From ST insights, organization must consider the interests and expectations of various stakeholder groups, including regulators, investors, employees, and the wider community (Freeman 1984). SA framework supports this expectation by providing systematic mechanisms for evaluating and improving ESG performance (Abdelfattah and Aboud 2020).

Accountability incorporates the responsibility for decisions and actions, including rectifying failures, while transparency focuses on the sharing of information. SA enhances this dimension by embedding ethical norms and promoting internal control systems, ensuring companies adhere to regulatory standards and stakeholder-driven expectations (Hazaea, Zhu, et al. 2021; El-Dyasty and Elamer 2020). According to institutional theory, firms adopt practices such as SA in response to pressures from regulations, public scrutiny, and societal norms to gain legitimacy (DiMaggio and Powell 1983). High-impact industries like mining and oil and gas face substantial environmental and social risks, making public trust critically important. SA plays a vital role in identifying governance weaknesses, enhancing risk management, and aligning corporate actions with societal expectations (Amoako, Bawuah, et al. 2023).

Empirical studies indicate a connection between SA and enhanced governance accountability. For instance, Ridley et al. (2011) highlight that SA improves ethical compliance and internal governance reforms. SA strengthens governance in emerging markets by aligning corporate actions with stakeholder expectations (El-Dyasty and Elamer 2020). Weak regulatory enforcement, political instability, and limited institutional capacity impede governance accountability in developing nations like Ghana and Nigeria. Firms in certain

contexts face significant scrutiny from local communities, civil society, and international entities. Consequently, SA provides a practical method for creating internal controls, enhancing ESG performance, and fostering stakeholder confidence, particularly in scenarios with limited external regulation. However, a significant gap exists in academic literature concerning the prolonged governance results of SA adoption within specific contexts. Although SA shows promise in improving disclosure and risk management, its effectiveness in enhancing accountability, especially in weak governance settings, warrants additional research. Based on stakeholder and institutional theories and supported by empirical evidence from emerging markets, we argue that SA enhances governance accountability by establishing ethical standards and risk oversight mechanisms.

H4. *Firms that adopt SA frameworks report higher levels of accountability in governance practices compared to those that do not.*

3.5 | ESA and Financial Performance

RBV posits that firms achieve a competitive advantage by effectively utilizing their distinctive resources (Barney 1991). ESA is effective in identifying operational inefficiencies and resource waste, contributing to improved financial results (Hart 1995; Lo et al. 2012). Research shows that ESA supports energy consumption optimization, waste management, risk reduction, and cost efficiency, all which contribute positively to financial performance (Harrer and Lehner 2024). ESAs serve as strategic tools to improve internal operations and financial efficiency, rather than solely serving as compliance instruments.

Empirical studies show that sustainable auditing results in financial benefits. For instance, Harrer and Lehner (2024) found that SA enhances energy efficiency, reduces waste, and lowers operating costs, positively impacting financial outcomes. Eccles et al. (2014) determined that sustainability reports subjected to external assurance were associated with enhanced market performance and increased investor confidence. Companies like Unilever and IKEA exemplify how SA can lead to reduced operational costs and enhanced sustainable financial stability (Unilever 2017; IKEA 2020). However, existing research shows that the link between ESG and financial performance is underexplored in developing economies and high-governance settings, particularly in high-impact industries (Harrer and Lehner 2024). The current gap requires more in-depth research into the impact of external sustainability on financial results across various industries and regions, particularly in sectors with high environmental risks and scarce data.

Operational inefficiencies and noncompliance with environmental standards in West African high-impact industries, such as mining and manufacturing, result in considerable financial and market access penalties. Ghana and Nigeria are under growing international pressure to implement ESG standards, but their compliance verification methods lack consistency. ESAs validate sustainability performance, boosting credibility and investor confidence for better access to finance. Moreover, firms operating under resource constraints find efficiency gains from auditing to be of significant financial importance, prompting the H5 below:

H5. *ESA positively impact a firm financial performance by reducing operational risks and enhancing cost efficiency.*

3.6 | ESA and Long-Term Value

From an LT perspective, firms enhance their long-term survival by aligning their operations with societal expectations (Clarkson et al. 2008). ESA reinforce this alignment by independently verifying responsible practices, increasing transparency, and improving trust among stakeholders (Eccles et al. 2014). Thus, ESAs serve as a mechanism for strengthening a firm's long-term legitimacy and competitive resilience. Empirical evidence supports this relationship. Studies show that ESA adoption is linked to enhanced stakeholder confidence, enduring brand loyalty, and persistent investor interest (Clarkson et al. 2008; Jayarathna et al. 2023). For instance, Patagonia's dedication to sustainability audits been credited with enhancing its brand equity and long-term profitability (Patagonia 2025). However, the existing literature predominantly concentrates on short-term operational or financial metrics, with a notable deficiency in examining how ESA foster strategic, long-term value creation, especially within under-researched regions like Africa.

In West African high-impact industries, firms function in environments marked by volatility, diminished institutional trust, and increased scrutiny from stakeholders. In Ghana and Nigeria, ESA can act as dependable indicators of dedication to ethical practices, thereby enhancing access to capital sensitive to ESG factors and improving market standing over the long term. Against this backdrop, we formulate the following hypothesis:

H6. *ESA help firms create long-term value by enhancing stakeholder trust and market positioning.*

Figure 1 below shows the framework of our research based on the above discussions.

4 | Methods

We collected data from Ghana and Nigeria, considering their shared characteristics as leading economies in West Africa with significant representation of high impact industries including oil and gas, mining, construction, and manufacturing (Business and Financial Times 2025). These sectors significantly contribute to environmental degradation and economic growth, making them vital in discussions on SA. Moreover, both countries have undergone similar reforms in corporate governance and sustainability reporting frameworks due to international regulatory pressures and investment trends (Reuters 2024, 2025). Their socio-economic commonalities and shared knowledge of global sustainability expectations are suitable for comparative investigation.

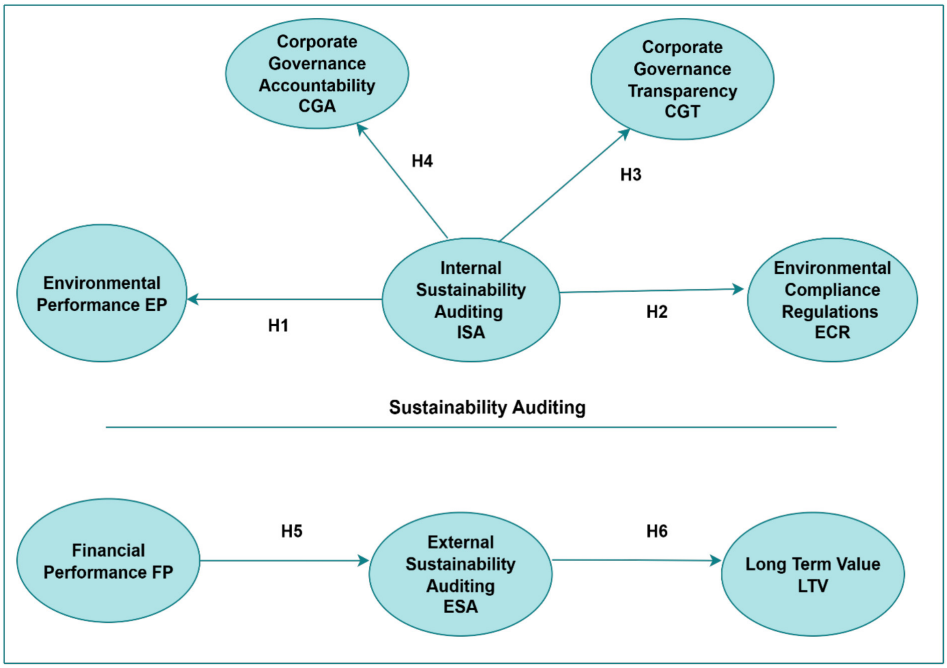

FIGURE 1 | Conceptual framework.

For our samples, we utilized a structured questionnaire to measure constructs on a 5-point Likert-type scale (1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*). A pretest was conducted with auditing and sustainability experts to assess the validity, relevance, clarity, and alignment of the questionnaire with the study's objectives and target population's understanding. Additionally, we contacted three academics in sustainability and accounting from UK universities to guarantee the questionnaire's content validity and accurate capture of key constructs and dimensions. The instruments were revised to enhance representation, reliability, and study variable coverage, while maintaining contextual relevance. Additionally, scales from prior studies were integrated to strengthen content validity. Following we conducted a pilot test among 15 respondents including senior executives and auditors in both Ghana and Nigeria. Feedback improved the instrument by eliminating ambiguities and enhancing clarity, ensuring the questions were significant and understandable to the target population. Before approaching our samples for data collection, we obtained ethical clearance from the lead and third authors' university.

4.1 | Sample 1 Ghana

Sample 1 was drawn from firms operating in the mining, constructions, manufacturing, and production industries, located primarily in Greater Accra, Ashanti and Western regions. These regions are key to gold mining, manufacturing, and construction, yet face environmental and governance challenges. Utilizing a random sampling technique, we contacted 600 firms by phone to explain the research's purpose and encourage participation. Following consent, we distributed physical questionnaires to CEOs, board members, sustainability officers, senior executives, and auditors. Data collection spanned from September 2024 to February 2025, utilizing a questionnaire that offered guidelines to potential participants while ensuring their confidentiality and anonymity. After several follow-ups and walked ins, 260 responses were received. After removing 10 incomplete questionnaires, the final usable sample was 250 firms, representing a 41.6% response rate.

4.2 | Sample 2 Nigeria

We applied the same measures from Sample 1 to collect data for Sample 2. A total of 800 firms were randomly selected from the mining, oil, construction, and manufacturing sectors in Lagos, Rivers, Delta, and Ogun, key industrial regions notable for their economic contributions and facing environmental and governance issues. Contact was contacted via phone and email to obtain consent, identify potential respondents, and explain the research purpose. Upon consent, questionnaires were distributed using online platforms such as WhatsApp and LinkedIn. Data collection also spanned between September 2024 and February 2025. After multiple remainders, 300 fully completed responses, with no missing were received, yielding a 37.5% response rate.

In total, 1400 firms were contacted, and 550 completed responses were analyzed. Table 1 presents the summary sample selection process.

Table 2 shows the summary of the demographic's statistics. Out of 550 participants, respondents were higher in Nigeria than in Ghana (Nigeria 300, 54.5% vs. 250, 45.5%). 30% were chief executive officers (CEO), followed by 29.4% being auditors, and 20.4% were senior and executive board. Regarding education, 50.1% hold postgraduate qualifications, and 30.8% declare to hold either PhD, DBA, or certifications. Considering

TABLE 1 | Step-by-step sample selection process.

Step	Ghana (*N*)	Nigeria (*N*)	Total (*N*)
Firms contacted	600	800	1400
Declined/no response	340	500	840
Incomplete/unusable questionnaires	10	0	10
Final completed and usable responses	250	300	550
Response rate (%)	41.6%	37.50%	39.30%

Note: Unusable refers to questionnaires with significant missing data or incomplete responses.

TABLE 2 | Demographics statistics.

Profiles	Frequency (percentage)	Mean	Std. dev
Country			
Nigeria	300 (54.5%)		
Ghana	250 (45.5%)		
Position		2.01	0.916
CEO	176 (32%)		
Senior and board executive	112 (20.4%)		
Sustainability officer	100 (18.2%)		
Auditor	162 (29.4%)		
Firm types		2.01	0.916
Manufacturing/ production	176 (32%)		
Mining/gold	100 (18.2%)		
Oil and gas	112 (20.4%)		
Construction	162 (29.4%)		
Education		1.92	0.764
Bachelors	105 (19.1%)		
Postgraduate	280 (50.1%)		
PhD/DBA/certificate	165 (30.8%)		
Work experience		2.59	0.913
1–10 years	178 (32.4%)		
11–20 years	220 (40%)		
21 and above	152 (27.6%)		
Obs.	550	550	550

Source: Authors' own work.

experience, 40% declared to be working between 11 and 20 years, 32.4% between 1 and 10 years, and 27.6% between 21 years and above.

TABLE 3 | Variable classification.

Type	Variables
Independent variables	Internal sustainability auditing, external sustainability auditing
Dependent variables	Environmental performance, environmental regulation compliance, corporate governance transparency, corporate governance accountability, financial performance, long-term value
Control variables	Firm size, industry type, corporate governance structure, stakeholder engagement, regulatory environment, sustainability certifications, historical performance data, R&D investment, employee training and awareness programs

4.3 | Variable Measurement and Operationalization

Our study employed both independent and dependent variables, alongside a set of control variables to account for firm-specific and contextual influences. All latent constructs were measured using multi-item 5-point Likert scales (1 = *strongly disagree*, 5 = *strongly agree*), unless stated otherwise. Independent and dependent variables were independently developed, with literature support to tailored to the study context, whereas control variables capture firm size, structure, industry type, and other relevant characteristics. Table 3 provides the summary of variable classification.

SAs were categorized into internal and external audits. Both were measured developed items aligned with the study context. Environmental performance and environmental regulation were assessed using six items each. Corporate governance was split into transparency and accountability, measured with six items each. Financial performance and long-term value were measured with four and five items, respectively.

Firm size (*FS*), industry type (*IT*), corporate governance structure (*CGS*), stakeholders' engagement (*SE*), regulatory environment (*RE*), sustainability certifications (*SC*), historical performance data (*HPD*), research and development investments (*R&D*), and employee training and awareness programs (*ETAP*) were controlled as these variables influence the role of SA in high-impact industries.

FS was measured utilizing the natural logarithms of the number of employees. Larger firms typically have more resources and complex operations, which may influence their capacity for and responsiveness to sustainability audits. IT was measured using natural logarithms on the industry the firm operates. This accounts for the fact that industries vary in environmental and social impact, with mining and manufacturing industries having higher environmental footprints than service industries. CGS was measured as a binary variable based on whether firm has dedicated sustainability committee (1 = *no* and 2 = *yes*). Evidence suggest to improve the

uptake of audit findings. *SE* was assessed on how often firms engage with sustainability issues based on the Likert scale (1 = *never*, 2 = *rarely*, 3 = *sometimes*, 4 = *often*, and 5 = *always*). Firms with higher engagement levels may experience greater external pressure and transparency demands.

RE was assessed through respondents' ratings of the stringency of environmental regulations in their region using a Likert scale (1 = *very lenient*, 2 = *lenient*, 3 = *neutral*, 4 = *strict*, and 5 = *very strict*). *SC* were measured as a binary variable (1 = *no*, 2 = *yes*), indicating whether the firm holds any recognized sustainability certification, such as ISO 14001. Such certifications can establish performance baselines and influence audit expectations. HPD was measured utilizing a 5-point Likert scale based on how respondents rated their firm's sustainability performance over the past 3 years. This control captures performance trajectory prior to the current auditing practices.

R&D measurement was determined by the natural logarithms of the percentage of the firm's budget allocated to R&D for sustainability initiatives. Finally, ETAP measured the efficiency of annual sustainability training programs for employees. This highlights that trained employees are expected to adhere to and implement sustainability practices identified during audits. Table 4 provides the descriptions of the constructs and items.

4.4 | Data Analysis

We analyzed our data using SPSS AMOS V.26 and hierarchical regression modeling (HRM). Mainly, the SPSS AMOS V.26 was used to estimate the measurement scale of indicators for each variable utilizing confirmatory factor analysis (CFA) for construct reliability, convergent validity, and discriminant validity. This technique has been utilized by previous studies (Junaid et al. 2022; Singh and Rosengren 2020; Quan et al. 2023). To test our hypotheses, we employed multiple hierarchical regression (MHR) modeling using SPSS. The method permits the sequential inclusion of variables into the regression model hierarchically, enabling a clear estimate of their individual and collective explanatory power (Dubey et al. 2015). Additionally, MHR effectively addresses multicollinearity issues by systematically assessing the distinctive contribution of each predictor (Dewasiri et al. 2024). Therefore, we developed robust analytical models to test hypotheses, incorporating control variables.

5 | Analysis and Results

5.1 | Common Method Estimates, Reliability, and Validity

To mitigate common method bias (CMB), we implemented both procedural and statistical remedies (Podsakoff et al. 2012). Procedurally, our survey ensured a comprehensive introduction, ensured anonymity and confidentiality, randomized question order to minimize response bias, and provided clear instructions to reduce construct ambiguity. Statistically, Harman's single factor statistical test was used, which showed that the first factor accounted for only 16.35% of the variance, well below the critical threshold of 50%. Additionally, we also applied the marker variable techniques (Lindell and Whitney 2001), using gender as a theoretically unrelated variable. The results showed a low, non-significant correlation ($r = 0.10$), confirming that CMB did not materially affect the data. Accordingly, our study experienced no CMB in our dataset.

We evaluate the reliability and validity of a measurement model, ensuring its accurate match with the actual situation (Wang et al. 2021), utilizing Cronbach's alpha (CA), factor loadings (FL), composite reliability (CR), and average variance extracted (AVE). Table 5 provides the results. Before evaluating the validity and convergent estimates, we assessed our survey sample adequacy and fitness of the data by adopting the Kaiser–Meyer–Olkin (KMO) index and Berlet chi-square. We found 0.79 of 1% significance superior to 0.6 standard for sample adequacy and fitness for analysis (Hair et al. 2010). FL of items for constructs exceeded the 0.5 minimum level. The reliability of a construct is typically tested using a CA value exceeding 0.7, which is within the standard range. From the results, CA exceeded the 0.7 threshold (BDA = 0.789, FI = 0.771, FP = 0.753, CS = 0.748, MP = 0.712) (Gliner and Morgan 2001). CR coefficients for variables exceeded the benchmark of 0.7 (Bonsu et al. 2024). Further, the results of the AVE values exceeded 0.5 thresholds, indicating that the variations reported by the questionnaire items were significantly larger than the changes driven by measuring errors (Raykov 2012). Thus, convergent validity is recognized for the paper sample.

Moreover, we evaluated the validity using the Fornell–Larcker standard and the heterotrait–monotrait (HTMT) ratio standards for discriminant validity, excluding unrelated indicators (Henseler et al. 2015). Table 6 shows the inter-construct correlation values and the diagonal square root of AVEs. Findings indicate that the square root of AVE values performs superior to any construct correlations that satisfy the requirements of the Fornell–Larcker criterion (Fornell and Larcker 1981). The HTMT ratio analysis was conducted to enhance discriminant validity due to insufficient criterion metrics (Henseler et al. 2015). The HTMT testing results fell below the upper cut-off of 0.85 (*see* Table 6). Thus, we confirm discriminant validity in this study.

5.2 | Hypothesis Testing and Discussions

Results from the hierarchical results validate the hypothesis testing. Particularly, the constructs' predictive relevance is evaluated utilizing R^2 and Q^2 (Cohen 1988). Table 7 reveals that ISA accounts for 59%, 67%, 64%, and 42% of the total variance in EP, ECR, CGT, and CGA. Moreover, ESA accounts for 47% and 57%of the total variance in FP and LTV. The study reveals that both constructs exhibit exceptional predictive capacity. In addition, the Q^2 value indicates the predictive significance of endogenous components, with a value greater than 0 indicating their predictive significance. We revealed that the research variables demonstrated predictive relevance (EP $Q^2 = 0.524$, ECR $Q^2 = 0.524$, CGT $Q^2 = 0.412$, CGA $Q^2 = 0.524$, FP $Q^2 = 0.524$, LTV $Q^2 = 0.524$).

H1 is validated as ISA positively and significantly influences the environmental performance of companies among

TABLE 4 | Summary of variable measurement and descriptions.

Variables	Items	Sources	Type	Items	Scale
Internal sustainability auditing	"Please specify the extent to agree or disagree with the below"	Self-developed	Independent	6	5-point Likert
	Our firm conducts regular internal sustainability audits.				
	Sustainability audits cover all key operational areas within the company.				
	Our firm ensures recommendations from internal audits are implemented effectively.				
	Internal sustainability audits are completed within the planned timeline.				
	Employees are actively involved in the internal sustainability audit process.				
	Our firm values the insights gained from internal sustainability audits.				
External sustainability auditing	"Please specify the extent to agree or disagree with the below"	Self-developed	Independent	6	5-point Likert
	Our firm undergoes external sustainability audits regularly.				
	External auditors thoroughly evaluate our sustainability practices.				
	The recommendations provided by external auditors are taken seriously by our firm.				
	Engaging external auditors has improved our overall sustainability performance.				
	External sustainability audits enhance our firm's credibility with stakeholders.				
	External audits are essential for maintaining regulatory compliance.				
Environmental performance	"Please specify the extent to agree or disagree with the below"	Self-developed	Dependent	6	5-point
	Our firm has implemented measures to reduce carbon emissions effectively.				
	We have set clear targets for reducing carbon emissions year-over-year.				
	Carbon emissions data are monitored and reported transparently.				
	Sustainability audits have led to significant reductions in carbon emissions.				
	Our firm actively offsets its carbon emissions through mitigation activities.				
	Carbon emissions reduction is a priority in our sustainability strategy.				

(Continues)

TABLE 4 | (Continued)

Variables	Items	Sources	Type	Items	Scale
Environmental regulation compliance	"Please specify the extent to agree or disagree with the below"	Self-developed	Dependent	6	5-point Likert
	We comply with all applicable environmental regulations.				
	Our management team places environmental compliance as a top priority.				
	Sustainability audits help us identify areas where we might breach regulations.				
	Any compliance issues identified are addressed promptly and effectively.				
	We invest in training to ensure compliance with environmental laws.				
	Sustainability audits have led to a reduction in fines or penalties for noncompliance.				
Corporate governance transparency	"Please specify the extent to agree or disagree with the below"	Self-developed	Dependent	6	5-point Likert
	We disclose board-level oversight of ESG issues.				
	Governance practices and decisions are communicated transparently to stakeholders.				
	We have clear policies to ensure transparency in corporate governance.				
	Stakeholders have access to comprehensive governance-related information.				
	Sustainability audits have enhanced the transparency of our governance practices.				
	Governance transparency is a priority for our firm's leadership.				
Corporate governance accountability	"Please specify the extent to agree or disagree with the below"	Self-developed	Dependent	6	5-point Likert
	Our governance structure includes oversight of ESG issues.				
	The board of directors actively addresses sustainability and accountability concerns.				
	Sustainability audits have improved accountability in governance practices.				
	Governance accountability is evident in the firm's response to audit findings.				
	Stakeholders are consulted on governance-related decisions and strategies.				
	We demonstrate accountability through timely reporting and actions.				

(Continues)

TABLE 4 | (Continued)

Variables	Items	Sources	Type	Items	Scale
Financial performance	"Please specify the extent to agree or disagree with the below"	Self-developed	Dependent	4	5-point Likert
	Improved return on investment (ROI).				
	Profit margins have improved				
	There are substantial cost savings.				
	There is significant contribution to long-term financial growth.				
Long-term value	"Please specify the extent to agree or disagree with the below"	Self-developed	Dependent	5	5-point Likert
	Sustainability audits are vital in establishing our firm's long-term strategic goals.				
	Our long-term growth has been significantly enhanced by investments in sustainability initiatives.				
	Our sustainability practices have significantly improved its future competitiveness.				
	Our firm's fosters long-term stakeholder trust and loyalty.				
	We ensure long-term financial and environmental stability.				
Control variables					
Firm size	Measured as the natural log of number of employees	Logged employees	Control	1	Continuous (log)
Industry type	Measured as the natural log of industry classification codes	Industry classification	Control	1	Continuous (log)
Governance structure	Does your firm have a sustainability committee? (1 = *no*, 2 = *yes*)	Self-reported	Control	1	Binary (1 = *no*, *no* = 2)
Stakeholder engagement	How often does your firm engage stakeholders on sustainability issues?	Self-reported	Control	1	5-point Likert
Regulatory environment	How would you rate the stringency of environmental regulations in your country/region?	Self-reported	Control	1	5-point Likert
Sustainability certifications	Does your firm hold any sustainability certifications (e.g., ISO 14001)?	Self-reported	Control	1	Binary (1 = *no*, *no* = 2)
Historical performance	Our sustainability performance has improved over the last 3 years.	Self-reported	Control	1	5-point Likert
Research and development investments	Measured as natural log of % of budget allocated to sustainability R&D.	Self-reported	Control	1	Continuous (log)
Employee training and awareness programs	Our firm conducts effective annual training on sustainability issues.	Self-reported	Control	1	5-point Likert

TABLE 5 | Reliability and convergent validity.

Variables	Items	FL	CA
Internal sustainability auditing	(AVE = 0.69, CR = 0.93)		0.79
	SIA-1	0.79	
	SIA-2	0.84	
	SIA-3	0.78	
	SIA-4	0.84	
	SIA-5	0.98	
	SIA-6	0.76	
External sustainability auditing	(AVE = 0.72, CR = 0.87)		0.92
	ESA-1	0.99	
	ESA-2	0.96	
	ESA-3	0.97	
	ESA-4	0.89	
	ESA-5	0.99	
	ESA-6	0.98	
Environmental performance	(AVE = 0.81, CR = 0.98)		0.94
	EP-1	0.94	
	EP-2	0.97	
	EP-3	0.98	
	EP-4	0.96	
	EP-5	0.92	
	EP-6	0.94	
Environmental compliance regulation	(AVE = 0.68, CR = 0.93)		0.93
	ECR-1	0.86	
	ECR-2	0.87	
	ECR-3	0.79	
	ECR-4	0.74	
	ECR-5	0.77	
	ECR-6	0.92	
Corporate governance transparency	(AVE = 0.69, CR = 0.93)		0.97
	CGT-1	0.82	
	CGT-2	0.74	
	CGT-3	0.88	
	CGT-4	0.84	
	CGT-5	0.74	
	CGT-6	0.96	
Corporate governance accountability	(AVE = 0.71, CR = 0.94)		0.92
	CGA-1	0.86	
	CGA-2	0.84	
	CGA-3	0.74	
	CGA-4	0.84	
	CGA-5	0.86	
	CGA-6	0.91	
Financial performance	(AVE = 0.65, CR = 0.87)		0.91
	FP-1	0.76	
	FP-2	0.76	
	FP-3	0.88	
	FP-4	0.74	
	FP-5	0.87	
Long-term value	(AVE = 0.66, CR = 0.81)		0.79
	LTV-1	0.86	
	LTV-2	0.72	
	LTV-3	0.78	
	LTV-4	0.83	
	LTV-5	0.84	

Source: Authors' own work.

high-impact industries (B = 0.537, $p < 0.001$). The model explains approximately 59.1% of the variance in environmental performance ($R^2 = 0.591$), suggesting a strong explanatory power. This suggests that ISA is not only statistically significant but also substantively impactful. This relatively high effect size and variance explained underscore that firms conducting regular and structured internal sustainability audits are more likely to enhance environmental practices regarding established sustainability frameworks, standards, and criteria (Coyne 2006; Hazaea, Tabash, et al. 2021). The findings support the literature on the role of sustainability reporting practices in promoting environmental performance management and sustainable business practices (Schaltegger and Burritt 2018; Zahid and Ghazali 2017). Moreover, the study supports the literature indicating that SA supports firms in monitoring environmental progress, optimizing energy consumption, reducing waste, and enhancing resource efficiency, thereby strengthening stakeholder relationships (Saeed and Cek 2024). The study suggests that SA, despite its limited environmental impact, could potentially reduce carbon emissions and improve resource efficiency in high-impact industries. Specifically, ISA enhances environmental performance by promoting regulations compliance, cleaner production technologies, and fostering continuous improvement,

TABLE 6 | Discriminant validity and HTMT results.

Constructs	1	2	3	4	5	6	7	8	Constructs	1	2	3	4	5	6	7	8
1. ISA	**0.83**								1. ISA								
2. ESA	0.445***	**0.85**							2. ESA	0.74							
3. EP	0.438***	0.337**	**0.91**						3. EP	0.83	0.63						
4. ECR	0.411**	0.318**	0.260**	**0.82**					4. ECR	0.67	0.69	0.66					
5. CGT	0.412**	0.421**	0.177**	0.577**	**0.83**				5. CGT	0.81	0.62	0.77	0.67				
6. CGA	0.352**	0.279**	0.131**	0.262**	0.213**	**0.84**			6. CGA	0.75	0.77	0.73	0.76	0.81			
7. FP	0.466**	0.289**	0.169**	0.177**	0.177**	0.158**	**0.81**		7. FP	0.76	0.68	0.66	0.77	0.67	0.75		
8. LTV	0.481**	0.156**	0.247**	0.278**	0.107**	0.276**	0.222**	**0.81**	8. LTV	0.68	0.75	0.84	0.81	0.80	0.76	0.72	

Note: The bold values are the square root of AVE is diagonal. ***, **, denotes 1%, 2% and 5% significance level value.
Source: Authors' own work.

while fostering transparency and accountability through rigorous assessments and reporting mechanisms. The findings further support that, SA encourages organizations to set measurable environmental targets, monitor progress, and integrate sustainability into strategic decision-making, identifying resource and waste management inefficiencies (Hegab et al. 2023; Swalih et al. 2024). The improvements improve a sustainable operational framework, boost corporate reputation, and align firms with global sustainability goals.

H2 predicted that companies that regularly conduct sustainability audits demonstrate better compliance with environmental regulations than those that do not. Our findings support H2, with ISA having a positive and significant effect on environmental regulations ($\beta = 0.237$, $p = 0.001$). The model explains approximately 67.2% of the variance in environmental regulations ($R^2 = 0.672$), indicating that ISA plays a meaningful role in enhancing regulatory adherence. Although the effect size is moderate, the high R^2 indicates that integrating internal audits into regular operations effectively enhances firms' environmental regulatory compliance, penalty reduction, and alignment with environmental governance frameworks. Internal sustainability audits are crucial for enhancing regulatory compliance and promoting proactive environmental strategies in firms, thereby integrating environmental considerations into decision-making processes. The study supports previous research indicating that high-impact organizations evaluate their environmental compliance, identify potential risks, and minimize regulatory violations (Deegan et al. 2002). This indicates that ISA is vital in ensuring that companies consistently evaluate their environmental performance, identify areas for improvement, and implement corrective actions to maintain regulatory compliance. ISA foster transparency and encourage organizations to adopt sustainable practices by continuously monitoring and accounting for environmental impact. Despite these benefits, the literature highlights a gap in comprehensive research linking the frequency of sustainability audits to quantifiable regulatory compliance outcomes (Zhang et al. 2023), suggesting further empirical studies to investigate the causal relationship between audit regularity and measurable compliance improvements. Notably, we discover that companies that regularly conduct ISA demonstrate better compliance with environmental regulations than those that do not, focusing on Ghana and Nigeria. Therefore, we highlight ISA capability to enhance environmental performance through compliance with environmental regulations of high-impact industries.

H3 anticipated that ISA would positively enhance corporate governance transparency. In Table 5, ISA is positively related to corporate governance transparency ($\beta = 0.342$, $PV < 0.001$). The model explains 64.2% of the variance in governance transparency ($R^2 = 0.642$), suggesting a substantial proportion of the improvements in the disclosure and transparency can be attributed to effective internal SA. Recent studies suggest that regular sustainability audit benefits firms meet societal expectations, manage risks, and foster stakeholder trust by providing transparent ESG data, ensuring compliance and showcasing responsible governance and sustainability (Yang and Basile 2021; Akeem et al. 2020). ISA is important for firms to enhance transparency by disclosing ESG information, as companies subject to such audits are more likely to publish detailed reports. For

TABLE 7 | Hierarchical regression results.

Variables	EP Model 1 Estimates	ECR Model 2 Estimates	CGT Model 3 Estimates	CGA Model 4 Estimates	FP Model 5 Estimates	LTV Model 6 Estimates
Internal sustainability auditing	0.537 (6.192) ***	0.237 (1.706) ***	0.812 (22.610) ***	0.652 (20.136) ***		
External sustainability auditing					0.689 (22.245) ***	0.756 (27.039)***
Controls						
Industry type	0.309 (6.478) ***	0.789 (4.257) ***	0.342 (3.327) ***	0.029 (4.556) ***	0.285 (3.416) ***	0.112 (8.495) ***
Corporate governance structure	0.296 (5.368) ***	0.118 (3.005) ***	0.004 (1.289) ***	0.801 (7.305) ***	0.45 (5.918) ***	0.039 (5.918) ***
Stakeholders engagement	0.103 (10.869) ***	0.309 (2.632) ***	0.341 (8.913) ***	0.256 (3.838) ***	0.091 (0.187) ***	0.628 (2.813) ***
Regulatory environment	0.236 (3.983) ***	0.328 (8.012) ***	0.575 (3.344) ***	0.196 (3.091) ***	0.011 (0.351) ***	0.561 (3.427) ***
Sustainability certifications	0.151 (8.123) ***	0.538 (4.071) ***	0.373 (2.621) ***	0.247 (3.295) ***	0.194 (8.105) ***	0.214 (8.938) ***
Historical performance data	0.815 (1.182) ***	0.383 (8.815) ***	0.018 (1.477) ***	0.007 (0.679) ***	0.387 (5.253) ***	0.243 (5.214) ***
Research and development	0.145 (2.423) ***	0.335 (5.889) ***	0.264 (4.470) ***	0.013 (0.173) ***	0.644 (5.707) ***	0.194 (6.301) ***
Employee training and awareness programs	0.015 (2.449) ***	0.312 (8.278) ***	0.144 (2.832) ***	0.108 (2.243) ***	0.495 (7.526) ***	0.426 (7.533) ***
Firm size	0.543 (7.543) ***	0.543 (7.543) ***	0.543 (7.543) ***	0.543 (7.543) ***	0.543 (7.543) ***	0.543 (7.543) ***
Adj. R^2	0.591	0.672	0.642	0.424	0.473	0.571
Max VIF	1.21	1.25	1.31	1.32	1.51	1.45
Obs.	550	550	550	550	550	550

Note: ***1%, **2%, and *5% indicate significance levels; *t*-statistics are in the parentheses.

instance, mining and construction firms are required to disclose their environmental impact assessments, carbon emissions data, and mitigation strategies due to significant environmental risks. In addition, ISA's transparency in corporate governance has significantly enhanced investor confidence and market performance, as firms conducting sustainability audits attract socially responsible investment funds. For example, Unilever's commitment to SA has significantly improved its ESG ratings, making it a preferred choice for impact investors. However, the literature is scarce on the effects of SA on corporate governance transparency. The study suggests that regular ISA by firms increase disclosure of ESG information, enhancing accountability and fostering stakeholder trust. Notably, our findings align with AT and ST suggesting that transparent governance mechanisms and sustainability audits improve governance by addressing stakeholder concerns, building long-term relationships, and mitigating risks associated with opportunistic managerial behavior (Deegan et al. 2002).

H4 is supported as results shows positive effects of ISA on corporate governance practices of high-impact industries in Ghana and Nigeria ($\beta = 0.652$, $PV < 0.001$). The model explains 42.4% of the variance ($R^2 = 0.424$) in corporate governance accountability, indicating that ISA plays a critical role in strengthening governance accountability structures. This suggests that firms conducting regular internal sustainability audits are more inclined to adopt sustainability responsibilities, act on audit findings, and align their governance with stakeholder and regulatory expectations. The results align with the literature that sustainability activities and disclosure can improve transparency, reputation, and competitiveness in an organization (Agyemang et al. 2020; Alshbili et al. 2021; Hassan et al. 2020; Chen et al. 2020). The findings are particularly relevant in the African context, where governance issues, regulatory enforcement, and environmental concerns are prevalent. ISA is key in Nigeria and Ghana for ensuring corporate accountability and responsible business practices in industries like mining, oil, and manufacturing. Specifically, Nigeria's oil and gas industry, dominated by Shell, Chevron, and NNPC, is grappling with environmental pollution, oil spills, and inadequate regulatory compliance. For instance, the Niger Delta region has been enduring environmental degradation for a long time due to inadequate implementation of sustainability policies. However, Nigerian Extractive Industries Transparency Initiative (NEITI) emphasizes the significance of sustainability audits for oil firms to ensure compliance with environmental and governance regulations. Similarly, the mining sector in Ghana, dominated by AngloGold Ashanti and Newmont Ghana, relies on SA to comply with the Minerals and Mining Act (2006) and EPA Ghana regulations to enhance corporate accountability. While existing literature extensively examines corporate auditing studies, critical gap remains in understanding how ISA can enhance corporate governance practices in high-impact industries in developing countries. The study provides new empirical evidence from Nigeria and Ghana context suggesting that firms adopting ISA frameworks report higher levels of accountability in governance practices. Notably, our findings support the AT that SA helps in reducing managerial opportunism, enhancing transparency, and reducing corruption in resource-rich Africa's industries, particularly those with environmental mismanagement and regulatory breaches.

For H5, our results support the hypothesis that ESA is positively associated with financial performance of high-impact industries ($\beta = 0.689$, $p < 0.001$). The model explains 47.3% of the variance ($R^2 = 0.473$) in financial performance, demonstrating moderate-to-strong explanatory power and indicating ESA's substantial contribution to firms' financial outcomes. The substantial effect size indicates that external audits are crucial for minimizing operational risks, identifying inefficiencies, and ensuring that organizational activities meet environmental and stakeholder standards. The results validate recent research by Harrer and Lahner (2024) that ESA is vital for long-term financial stability by identifying environmental and social risks, thereby mitigating potential financial performance impacts. The study suggests that firms undergoing independent sustainability experience enhance financial outcomes for firms, including profitability, cost efficiency, investor confidence, and risk mitigation. External audits in oil and gas, mining, manufacturing, and energy enhance credibility, transparency, and sustainability standards, thereby promoting long-term financial stability. Firms that implement ESA experience enhanced investor trust, reduced operational costs, and enhanced market competitiveness, thereby promoting long-term financial sustainability. The results align with previous research indicating a positive correlation between SA and financial performance (Eccles et al. 2014). For instance, Ntim et al. (2013) indicate that firms conducting ESA attract more foreign direct investment in Africa, particularly in sectors like oil and gas, mining, and manufacturing. Chen et al. (2020) assert that ESA serve as a risk-mitigation strategy, thereby reducing financial volatility and enhancing operational efficiency. Accordingly, we argue that firms' ESA can enhance the financial performance of high-impact industries in Ghana and Nigeria. However, our findings support both RBV and ST that unique resources offer firms a competitive edge, increased stakeholder accountability, improved brand reputation, attracted responsible investors, and improved long-term financial performance.

Finally, H6 shows that external sustainability audit is positively related to long-term value ($\beta = 0.756$, $PV < 0.001$). The model accounts for 57.1% of the variance in long-term value, signifying a strong effect size and positioning ESA as a substantial predictor of firms' strategic approaches to sustainable future growth. We suggest that ESA present a comprehensive evaluation of a firm's ESG, enhancing transparency, risk management, and stakeholder trust, whiles factors such as environmental sensitivity and regulatory compliance further contribute to the long-term financial stability, competitive advantage, and investor confidence. Moreover, ESA audits boost investor confidence, attract capital, improve risk management, and promote innovation, attracting companies like Dangote Cement and AngloGold Ashanti to align with international ESG standards. These audits benefit, identify, and mitigate environmental and governance risks, reduce financial losses, and encourage innovative business models, contributing to long-term value creation. The RBV reveals that ESA improves a firm's intangible assets, including reputation, corporate legitimacy, and stakeholder relationships, thereby enhancing its competitive advantage (Barney 1991). However, the literature indicates a significant gap in research on the long-term value of ESA in high-impact industries. Therefore, we posit that ESA enhance stakeholder trust and market positioning, thus enhancing long-term value for firms.

Regarding control variables, industry type, corporate governance structure, stakeholders engagement, regulatory environment, sustainability certifications, historical performance data, research and development, employee training and awareness programs, and firm size have positive and 1% significant impact on EP, ECR, CGT, CGA, FP, and LTV. The findings suggest that companies in high-impact industries are typically more motivated to improve these areas due to regulatory pressure and reputational risks. A strong corporate governance structure enhances transparency and accountability, whereas effective stakeholder engagement aligns company practices with societal expectations. A supportive regulatory environment and sustainability certifications incentivize companies to comply with environmental standards, whereas historical performance data enable continuous improvement. Investments in R&D and employee training further contribute to environmental and governance improvements, fostering innovation and creating efficiencies. For instance, larger firms often have the resources to implement these initiatives, reinforcing positive outcomes across environmental, governance, and financial dimensions. Together, these factors create a reinforcing cycle of improvement, ultimately leading to enhanced long-term value creation.

Our findings align with global literature on sustainability audits' roles in enhancing performance and governance (Eccles et al. 2014; Ioannou and Serafeim 2019; Schaltegger and Burritt 2018; Khan and Liu 2023; Jizi and Thomas 2025; Girón et al. 2021). However, the regulatory environments in Ghana and Nigeria differ significantly from those in Europe and Asia. For instance, in Europe, SA is primarily influenced by compliance requirements, particularly those set by the EU Corporate Sustainability Reporting Directive, necessitating ESG disclosures and independent third-party verification (Operato et al. 2025; Gerwing et al. 2022). However, in Ghana and Nigeria, SA is a voluntary practice that enhances legitimacy and boosts investor confidence, especially where regulatory oversight is limited. Similarly, whereas Asian contexts like China promote state-led ESG initiatives and top-down compliance, African high-impact industries depend on firm-level governance mechanisms for sustainability risk management (Liu and Anbumozhi 2009). This divergence highlights that sustainability audits serve different purposes: In Africa, they address institutional gaps and enhance accountability, whereas in developed countries, they operate within established legal standards. These contextual variations underscore the necessity of tailoring global sustainability frameworks to local governance structures.

5.3 | Robustness and Heterogeneity Analysis

We adopted the partial least squares to test the robustness of our hypothesis. PLS-SEM is a widely used estimating method in business and finance research, enabling simultaneous testing relationships and addressing measurement errors for robust causal predictive modeling results (Hair et al. 2020). Additionally, the PLS-SEM is recognized as a predictive tool that ensures reliable hypothesis confirmation and model performance by assessing predictive relevance and effect sizes (Chin et al. 2020). The results from the PLS-SEM are displayed in Figure 2. From the results, H1 is validated as ISA has a positive effect on EP meaning that, internal SA helps firms to address ecological issues leading to enhanced environmental performance. Likewise, H2, H3, and H4 are validated as ISA has positive and significant effects on ECR, CGT, and CGA, indicating that regular ISA in high-impact industries is essential for enhancing environmental compliance, promoting transparency in corporate governance, and ensuring accountability. ISA enhance organizations' environmental and governance practices, promoting responsibility and adherence to regulatory and ethical standards. Finally, H5 and H6 are confirmed as ESA evidence positive and significant on financial performance and long-term value, indicating that ESA positively impact organizations' financial outcomes and long-term value creation by assessing environmental, social, and governance factors. Moreover, research indicates that companies that are transparent, accountable, and committed to sustainability may experience improved financial performance and long-term value creation due to enhanced reputation, risk management, and operational efficiencies.

5.3.1 | Findings by Industry Types

High impact industries like oil and gas, mining, and agriculture face unique challenges like environmental risks, governance issues, and financial implications, affecting the

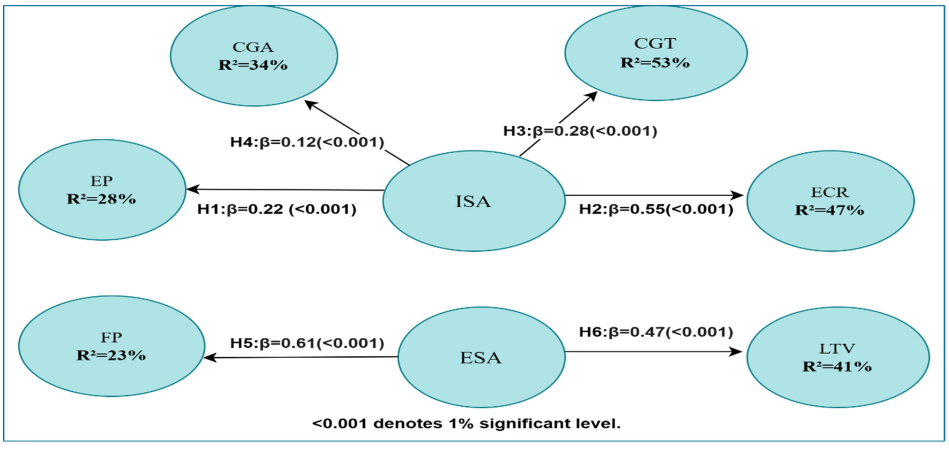

FIGURE 2 | Robustness results.

TABLE 8 | Industry types.

Variables	Construction	Manufacturing/production	Mining/gold	Oil and gas
ISA → EP	1.22 (35.91)***	1.17 (16.62)***	1.25 (20.26)***	1.24 (13.17)***
ISA → ECR	0.64 (10.56)***	0.58 (4.92)***	0.63 (5.34)***	0.71 (4.34)***
ISA → CGT	1.28 (32.61)***	1.22 (14.14)***	0.32 (8.19)***	1.41 (15.24)***
ISA → CGA	1.11 (20.14)***	0.98 (1.14)***	1.13 (10.82)***	1.24 (8.88)***
ESA → FP	0.61 (22.24)***	0.59 (11.56)***	0.37 (14.08)***	0.34 (8.55)***
ESA → LTV	0.38 (27.04)***	0.17 (14.05)***	0.19 (13.52)***	0.25 (18.20)***
R^2	0.62	0.54	0.52	0.47
Obs.	162	176	100	112

Note: ***1%, **2%, and *5% indicate significance levels.
Source: Authors' own work.

effectiveness of SA. We utilize industry types consisted of four groups. Considering the works of (Bonsu et al. 2025; Corbet et al. 2024), such characteristics can drive the nexus amid SA, corporate governance, and sustainability performance. The analysis utilized STATA's ordinary least regression modeling to explore the potential benefits of SA in improving corporate governance, EP, and financial outcomes across various sectors. From Table 8, we find a positive and significant effect of all direct hypotheses for firm groups. Mainly, ISA is positively related to environmental performance for all groups. Interestingly, the effect of ISA on environmental performance is larger in mining/gold firms, suggesting that mining industries face significant environmental risks and regulatory pressures, including deforestation and water contamination, necessitating strict compliance with environmental laws to mitigate environmental damage. ISA assists in enhancing mining sector's environmental performance, ensuring regulatory compliance, mitigating risks, and promoting transparency, accountability, and sustainability audits for cost savings and sustainable business practices. Similarly, the results evince a positive effect of ISA on ECR for both firm types, with a larger impact observed in oil and gas firms. Oil and gas companies are more responsive to ISA's insights and recommendations due to the high environmental risks associated with their operations. The intricate regulatory landscape and substantial environmental impact of these companies may necessitate a heightened emphasis on compliance through internal auditing practices. Oil and gas firms face strict regulations and scrutiny due to environmental risks, making ISA implementation essential for ensuring adherence to environmental standards. Moreover, we find a positive effect of ISA on CGT and CGA, with larger effect for oil and gas. Oil and gas firms face regulatory, environmental, and social pressures, requiring increased transparency and accountability. Implementing ISA can improve governance by identifying weaknesses through audits. Therefore, we emphasize the significant impact of SA on corporate governance structures in high-risk industries, particularly in oil and gas firms.

Additionally, the results show that ESA is positive and significant on FP and LTV for all firms. Notably, the effect is larger for construction firms, suggesting that construction companies as resource-intensive operations and sustainability focus, may benefit more from external audits. ESA assists businesses in identifying cost reduction opportunities, enhancing operational efficiency, and enhancing environmental and social performance, leading to improved financial outcomes and long-term value creation. ESA insights can assist construction firms in complying with environmental regulations, waste management, and resource consumption, promoting sustainable practices for long-term profitability.

TABLE 9 | Country comparison results.

Relationships	Ghana Estimates	Nigeria Estimates
H1:ISA → EP	0.21 (0.24)***	0.18 (0.21)***
H2:ISA → ECR	0.19 (0.09)***	0.17 (0.06)***
H3:ISA → CGT	0.32 (0.19)***	0.23 (0.74)***
H4:ISA → CGA	0.26 (0.18)***	0.22 (0.67)***
H5:ESA → FP	0.22 (0.07)***	0.28 (0.89)***
H6:ESA → LTV	0.23 (0.11)***	0.25 (0.09)***
Obs.	250	300

*** denotes $p < 0.01$ (1%) significance level.

5.3.2 | Findings by Cross Country

We utilized regression modeling to analyze and compare Ghana and Nigeria to comprehend individual country effects. From Table 9, the significant impact of ISA on EP is observed in both Ghana and Nigeria, with a larger effect in Ghana. This can be attributed to Ghana's stronger environmental regulations, more rigorous enforcement, and increasing focus on sustainability. Notably, Ghana has made significant progress in improving its environmental governance and regulatory frameworks, particularly in mining to ensure environmental compliance. The increasing regulatory environment and public awareness of environmental issues are expected to prompt

Ghanaian firms to respond more effectively to ISA's recommendations, thereby enhancing their environmental performance. In contrast, Nigeria faces challenges including weaker regulatory enforcement and governance issues, which may limit the effectiveness of ISA in advancing environmental performance. Thus, Ghana's proactive approach to environmental governance enhances the impact of ISA on EP compared to Nigeria. Likewise, ISA reveals positive and significant impacts on CGA and CGT with their effect larger in Ghana than in Nigeria. The findings can be linked to the below factors. First, Ghana's robust regulatory framework and institutional support for corporate governance promote transparency and accountability. Additionally, Ghana's commitment to sustainability and ethical business practices is bolstered by both governmental and societal pressures. Yet, Nigeria faces challenges in governance, enforcement, and corruption, potentially reducing the effectiveness of the ISA in enhancing CGA and CGT. Therefore, the significant influence of ISA on corporate governance practices is likely due to Ghana's established governance systems. Lastly, the study reveals a significant positive impact of ESA on FP and LTV, with the effect being more pronounced in Nigeria than in Ghana. This can be explained by several factors. First, Nigeria's oil and gas industries require external auditing for improved operational efficiency, financial transparency, and long-term sustainability due to their diverse industrial base. Additionally, Nigeria's increasing demand for sustainability practices is fuelled by international investors and regulatory pressure, potentially enhancing the positive impact of ESA on financial performance and long-term value. However, the less mature regulatory framework and smaller scale of some industries in Ghana could contribute to the more moderate effect of ESA on FP and LTV in comparison with Nigeria.

5.4 | Addressing Endogeneity and Alternative Estimations

To address potential endogeneity, selection bias, and model sensitivity, alternative estimation strategies and measurement robustness checks were implemented, aligning with established methodological recommendations (Hair et al. 2020). First, we adopted propensity score matching (PSM) due to the cross-sectional nature of the data and the observed likelihood of systematic differences between firms involved in SA (ISA or ESA) and non-auditing firms concerning factors such as size, structure, and stakeholder engagement. Firms were matched using key control variables such as firm size, industry type, corporate governance, stakeholder engagement, and regulatory environment. Notably, we utilized the nearest-neighbor matching without replacement, with subsequent analysis on the matched sample to evaluate the average treatment effects of ISA and ESA on dependent outcomes. From Table 10, our findings were statistically significant and consistent with the hierarchical model, indicating that the observed effects are not merely due to inherent differences between firms that employ auditing practices and those that do not. Particularly, the matched sample showed that ISA remained positively and significantly associated with environmental performance, regulatory compliance, and corporate governance, whereas ESA remained its robust effect on financial performance and long-term value.

TABLE 10 | Comparison of original estimates and robustness test using PSM.

Relationship	Original estimate (β)	PSM estimate (β)
ISA → environmental performance	0.537***	0.502***
ISA → environmental compliance	0.237***	0.221***
ISA → governance transparency	0.812***	0.775***
ISA → governance accountability	0.652***	0.618***
ESA → financial performance	0.689***	0.652***
ESA → long-term value	0.756***	0.722***

*** denotes $p < 0.01$ (1%) significance level.

Second, we re-estimated the model using different item combinations for each latent variable to evaluate the robustness of our constructs against variations in measurement specifications. For instance, (1) the construct for environmental performance was estimated using five items instead of six by removing the item with the lowest factor loading.(2) ISA was evaluated as both a reflective and composite construct within the model to ensure consistency. Our modifications resulted in minimal changes to path coefficients and model fit indices, demonstrating that the findings are robust across different construct operationalizations.

Finally, we employed HRM analysis with firm-specific and contextual controls (e.g., *firm size, industry type*, *governance structure*, *stakeholder engagement*, and *sustainability certifications*) to address omitted variable bias and reduce endogeneity and used PLS-SEM as a robustness check. However, both HRM and PLS-SEM do not fully eliminate the possibility endogeneity, particularly those arising from reverse causality or unobserved heterogeneity; thus, we conducted several measures to mitigate these risks. First, our regression models accounted for critical control variables to minimize bias from omitted factors that might influence both the independent and independent variables. Second, we tested among independent and control variables in the regression models. Notably, all VIF values were well below the threshold 3.0 (*the highest VIF is 1.5—see* Table 9), indicating that multicollinearity was not a concern and estimates were stable. Finally, due to the anonymous, cross sectional survey design, we could not adopt advanced techniques like generalized method of moments (GMM), Heckman selection models, or entropy balancing, which require either panel data, instrumental variables, or matched firm-level identifiers. These were unavailable by design to protect respondent confidentiality and ethical standards of anonymity. However, within the constraints of our research design, the adopted robustness checks provide substantial assurance that the results are not driven by model artifacts or sample bias. Future research should employ longitudinal or panel data with instrumental variable techniques or

difference-in-differences estimation to better address endogeneity and enhance causal inference.

6 | Conclusion and Implications

We investigate the impact of SA on corporate governance, environmental, and financial performance of High Impact Industries using multi-theoretical frameworks such as stakeholders, legitimate, accountability, and RBV theories. The proposed links were empirically validated using data from 550 Ghanaian and Nigerian high-impact industries. The empirical findings show that internal SA positively influences environmental performance, environmental compliance, corporate governance transparency, and corporate governance accountability. Additionally, we find that ESA positively influences financial performance and the long-term value of firms. The research shows SA is crucial for improving environmental compliance, governance transparency, and financial performance in industries like mining, manufacturing, and oil and gas. Overall, we underscore the importance of embedding SA frameworks within corporate governance structures to foster both environmental and economic sustainability in high-impact industries.

6.1 | Theoretical Implications

Theoretically, our work significantly contributes to the existing literature. First, despite literature highlighted sustainability reporting practices and environmental performance management driving sustainable business practices (Khatri and Kjærland 2023; Al-Shaer and Hussainey 2022), limited scholarships have utilized multi-theoretical frameworks to discover SA impact on high-impact firms' environmental performance. Additionally, few studies link the frequency of sustainability audits to regulatory compliance outcomes (Zhang et al. 2023). This study addresses the gaps by confirming that SA significantly enhances environmental performance and regulatory compliance in high-impact industries, reducing carbon emissions, improving resource efficiency, and optimizing energy use.

Second, literature shows sustainability activities enhance transparency and competitiveness, but the impact of sustainability frameworks on governance accountability, particularly in high-impact industries remains underexplored. Moreover, SA studies often overlook the long-term effects of corporate governance transparency and accountability due to governance challenges, highlighting the need for a comprehensive examination of its impact in developing nations. We fill the gaps by highlighting the significant positive impact of SA on corporate governance accountability and transparency in high-impact organizations. Third, literature mainly applied firm secondary data to evaluate financial performance, corporate governance, and environmental performance. We used survey questionnaires to develop firm-level measurements, aiming to understand ESG and financial performance through sustainability audits in high-impact industries in Ghana and Nigeria. Additionally, limited studies have examined ESA impact on financial performance and long-term value in developing countries with unique challenges. We suggest that ESA enhances Ghana and Nigeria's financial performance and long-term value by reducing carbon emissions and offering sustainability audit insights for developing markets.

Finally, we examine the impact of SA on corporate governance, environmental, and financial performance in high-impact industries, extending stakeholders, legitimacy, accountability, and RBV. We argue that SA aids firms in managing stakeholder demands, aligning with societal norms, enhancing transparency, reducing reputational risks, and fostering trust while also leveraging eco-friendly technologies and social capital (Gao and Zhang 2006; Jan et al. 2021; Suchman 1995; Crossley et al. 2021; Gray et al. 2001; Barney 1991). Our findings provide a novel ESG framework and offer insights for policymakers and industry leaders on improving governance, transparency, and performance through SA, transforming firms into sustainability and governance leaders.

6.2 | Managerial (Practical) and Policy Implications

We provide practical implications for firms, particularly in high-impact industries like mining, oil and gas, and manufacturing, offering actionable practices. First, regular sustainability audits can enhance a firm's environmental performance by reducing carbon emissions and increasing resource efficiency. In practice, managers should implement a systematic sustainability audit process to monitor energy consumption, waste management, and resource efficiency. Regular audits should guide the development of effective strategies for carbon reduction and operational sustainability. For instance, firms can improve their sustainability efforts by implementing cleaner production technologies and tracking their progress using sustainability-focused key performance indicators.

Second, we suggest that regularly sustainability audits can enhance firms' compliance with environmental regulations, avoid penalties, and improve governance. Therefore, companies should incorporate sustainability audits into their risk management strategy to identify regulatory risks, assess compliance levels, identify gaps, and implement corrective measures for environmental regulations. Additionally, firms should foster a culture of continuous improvement by setting measurable compliance objectives and implementing proactive environmental strategies.

Third, our results indicate that regular SA significantly enhances corporate governance transparency, especially concerning environmental, social, and governance disclosures. In practice, managers should prioritize sustainability audits to improve transparency in ESG practices, including carbon emissions, waste management, and social impacts, and invest in ESG data collection tools to foster trust.

Fourth, SA frameworks are increasingly being adopted by firms to enhance their governance accountability, reputation, and stakeholder relationships. Managers should regularly conduct sustainability audits and ensure that the results are shared openly with stakeholders to improve accountability. Additionally, sustainability audits can enhance internal governance practices, minimize managerial opportunism, and

prevent corruption by serving as a benchmark. For instance, implementing clear internal accountability structures linked to sustainability performance can significantly improve corporate responsibility. Additionally, we demonstrate that ESA can enhance financial performance by boosting credibility, minimizing operational risks, and enhancing cost efficiency. Therefore, firms should engage third-party auditors to assess sustainability practices, identify financial risks, and evaluate environmental, social, and governance factors, thereby improving operational efficiency, reducing costs, and attracting socially responsible investors. Finally, we suggest that ESA audits significantly boost a company's long-term value by enhancing stakeholder trust, improving risk management, and aligning business practices with global sustainability standards. Therefore, managers should utilize ESA for strategic planning, risk management, reputation enhancement, and capital attraction while adhering to international ESG standards ensures sustainable value creation.

Besides the managerial implications, we provide clear policy recommendations to strengthen SA practices and enhance their impact in high impact industries in Ghana and Nigeria.

1. Policymakers should enact regulations requiring internal and ESA for sectors mining, oil and gas, and manufacturing. To ensure audit effectiveness, governments and professional bodies should invest in capacity building programs for sustainability auditors. This includes developing certification schemes, continuous training, and technical support, equipping auditors with the latest ESG standards and industry specific.
2. Regulatory bodies must recognize the diverse challenges across sectors and tailor sustainability audit requirements accordingly. For instance, the mining industry's focus should be on responsible resource use and community impact, whereas the oil and gas sector need rigorous environmental risk disclosures related to pollution and emissions.
3. Policymakers are advised to create incentives, including tax relief, access to green finance, or public acknowledgment, to motivate companies to comply with and surpass sustainability audit mandates. Such incentives can motivate organizations to achieve environmental improvements that exceed regulatory requirements, thereby fostering innovation and ongoing enhancements in environmental performance.
4. Governments should finance research in sustainable technologies and auditing methodologies, alongside funding for employee training programs. The approach provides companies with essential human capital and knowledge for successful sustainability practice implementation and auditing of findings. Lastly, policymakers should leverage aggregated audit data to inform environmental and economic policies, supporting national sustainability targets aligned with global commitments like the SDGs.

6.3 | Limitations and Further Research

We faced certain limitations despite our significant findings. First, we focus on high-impact industries in Nigeria and Ghana, limiting the generalizability of our findings to other countries or industries. Future research could expand the scope to different geographic regions and sectors to explore whether the observed relationships hold across diverse economic and weaker environments. Additionally, cross-industry comparisons would provide deeper insights into the role of SA on corporate governance, environmental, and financial performance in high-impact industries. Second, we utilized survey-based questionnaire data; although it effectively captured perceptions and behaviors, it may introduce method bias and measurement errors. The use of self-reported data also raises the possibility of endogeneity, particularly due to omitted variables or reverse causality. Future research could enhance causal inferences by utilizing secondary data sources, instrumental variable (IV) approaches, or panel data analysis. Finally, our use of cross-sectional estimates limits the ability to capture dynamic changes over time; thus, future research should adopt longitudinal studies to better assess causal relationships and enhance robustness.

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Conflicts of Interest

The authors declare no conflicts of interest.

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