Effect of Corporate Environmental Disclosure on Investor Decisions in the Oil and Gas Sector in Nigeria

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ABSTRACT

Backgrounds: Corporate environmental disclosure is increasingly important to investors, yet Nigerian studies examine it only in aggregate, obscuring which specific dimensions drive investor response.

Objectives: This study specifically assesses the effects of environmental policies and practices disclosure, environmental expenditures and investments disclosure, GHG emissions disclosure, compliance with environmental regulations disclosure, and environmental audits and certifications disclosure on market capitalization.

Methodology: The study adopted a quantitative correlational research design using secondary panel data drawn from the annual reports, sustainability reports, and financial statements of all 13 oil and gas companies, covering the five-year period 2019 to 2023 (65 firm-year observations). A binary content-analysis disclosure checklist was used to construct an index score for each disclosure dimension, and data were analysed using descriptive statistics, correlation analysis, and panel regression.

Findings: Environmental policies and practices disclosure ($\beta = .34$, $p < .001$), GHG emissions disclosure ($\beta = .29$, $p < .01$), and environmental audits and certifications disclosure ($\beta = .31$, $p < .001$) each had significant positive effects on market capitalization, while environmental expenditures and investments disclosure ($\beta = .18$, $p < .05$) and compliance with environmental regulations disclosure ($\beta = .21$, $p < .01$) also showed significant, comparatively smaller positive effects.

Conclusions: Corporate environmental disclosure across all five dimensions is significantly and positively associated with market capitalization, with policy disclosure and third-party audit certification exerting the strongest effects. Firms should strengthen policy communication and pursue independent audits and certifications, while regulators should standardize disclosure requirements.

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1. INTRODUCTION

Corporate environmental disclosure (CED) has evolved into a critical element of sustainable business practice globally, gaining considerable attention from investors, regulators, and civil society amid growing environmental concerns. Rising environmental degradation, climate change, and global regulatory standards such as the Task Force on Climate-related Financial Disclosures (TCFD) have pressured companies, particularly in high-impact sectors like oil and gas, to report on their environmental performance transparently. Investor decisions, especially those involving long-term capital allocation, are increasingly shaped by a firm's environmental disclosures, as investors seek assurance on environmental risk mitigation, regulatory compliance, and sustainable value creation (Liu et al., 2024).

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Corporate environmental disclosure (CED) has evolved into a critical element of sustainable business practice globally, gaining considerable attention from investors, regulators, and civil society amid growing environmental concerns. Rising environmental degradation, climate change, and global regulatory standards such as the Task Force on Climate-related Financial Disclosures (TCFD) have pressured companies, particularly in high-impact sectors like oil and gas, to report on their environmental performance transparently. Investor decisions, especially those involving long-term capital allocation, are increasingly shaped by a firm's environmental disclosures, as investors seek assurance on environmental risk mitigation, regulatory compliance, and sustainable value creation (Liu et al., 2024).

In Africa, too, economies are undergoing a gradual shift as investors pay closer attention to non-financial disclosure. Although Africa lags behind developed regions in mandatory environmental disclosure regulation, initiatives such as the African Securities Exchanges Association's sustainability guidance and the African Development Bank's green-financing programmes are encouraging firms to integrate environmental factors into corporate reporting (AFDB, 2025; Akinleye & Ogundipe, 2024). The oil and gas sector, a dominant contributor to African GDP and foreign-exchange earnings, faces particular scrutiny over its environmental footprint, which positions environmental disclosure as a potentially influential factor in investment decisions. In Nigeria specifically, the Nigerian Exchange Group's sustainability disclosure guidelines and the broader adoption of ESG principles have begun to influence investor sentiment, as investors gradually shift from a purely profitability-based focus toward considering sustainability indicators alongside financial performance (Subai, 2019).

Against this background, CED encompasses a range of firm-reported information relating to environmental impacts, strategies, and outcomes, including policies, expenditures, emissions data, compliance levels, and third-party audits and certifications. Each of these elements provides investors with insight into a firm's commitment to sustainability and its exposure to environmental risk. Environmental policies and practices disclosure signals that environmental issues are being proactively managed (Ogunode & Adegbie, 2022); environmental expenditures and investment disclosure provides tangible evidence of a firm's financial commitment to sustainability (Tsang et al., 2023); GHG emissions disclosure allows investors to evaluate climate-risk exposure (Aiuto et al., 2024); disclosure of compliance with environmental regulations reduces perceived exposure to fines, shutdowns, and reputational damage (Audu & Umana, 2024); and third-party environmental audits and certifications reduce information asymmetry by validating the accuracy of a firm's environmental data (Marwa et al., 2020).

Investors assess these dimensions holistically, weighing the consistency between what a firm states as policy, what it spends, what it emits, how it complies, and what independent verification confirms. Firms that demonstrate coherence across these dimensions are more likely to gain investor trust than firms disclosing selectively or inconsistently which is a dynamic particularly consequential in the oil and gas sector, where reputational and environmental risks are heightened and where a single high-profile spill or regulatory breach can rapidly erode years of accumulated investor confidence (Attig et al., 2024). As capital markets integrate ESG screening into portfolio construction, environmental disclosure is transitioning from a voluntary exercise into a strategic determinant of access to capital (Basdekis, 2023).

Yet existing research, both globally and within Nigeria, has largely examined environmental disclosure in aggregate form. This approach obscures which specific dimensions drive investor response and leaves firms and regulators without clear guidance on where to allocate limited disclosure resources. A dimension-specific analysis is therefore required to resolve this empirical and methodological limitation: only by isolating the individual effects of policy, expenditure, emissions, compliance, and audit disclosure can the relative weight of each signal be established, and only then can Nigerian oil and gas firms and their regulators prioritise the practices that most effectively strengthen investor confidence and market valuation.

The oil and gas industry plays a critical role in economic development but remains among the most environmentally intensive sectors, and investors are becoming increasingly cautious and environmentally conscious in their decision-making. The extent to which corporate environmental disclosure actually influences investor decisions in Nigeria's oil and gas sector, however, remains empirically ambiguous, particularly given inconsistent disclosure standards, varied compliance

practice, and persistent concerns over greenwashing and unverified sustainability claims (Hassan, 2024). Many oil and gas companies still provide vague or inconsistent information on how they mitigate environmental harm, increasing investor scepticism, especially among ESG-focused investors, and reducing their capacity to assess long-term environmental viability (Gerged, 2020; Okeke, 2021). Inadequate disclosure of environmental expenditures similarly obscures whether firms are allocating sufficient resources toward mitigating environmental risk or transitioning to cleaner technologies (Madugba et al., 2020), while inconsistent GHG emissions measurement and limited third-party verification can mislead investors about a firm's true environmental footprint and climate-risk exposure (Cenci & Biffis, 2025). Non-compliance with environmental regulations further exposes firms to fines, shutdowns, and reputational damage that directly threaten investor returns (Lo et al., 2020).

Much of the existing literature on CED and investor behaviour derives from developed-market or cross-country samples, and where Nigerian evidence exists, it has generally examined disclosure and firm value in aggregate rather than decomposing environmental disclosure into its constituent dimensions including policies, expenditures, emissions, compliance, and third-party audits and testing each against a specific investor-decision proxy within a single, sector-focused empirical model. This creates uncertainty for regulators, investors, and oil and gas firms themselves about which specific disclosure dimensions carry the greatest weight in shaping investor behaviour, and risks misdirecting firms' limited disclosure resources toward dimensions that carry comparatively little weight with investors while under-investing in those that carry the most.

This uncertainty is compounded by the absence, within the Nigerian regulatory environment, of a single mandatory environmental-disclosure standard analogous to the TCFD or the EU's Corporate Sustainability Reporting Directive, leaving firms to determine independently which of the five disclosure dimensions to prioritise and to what depth. Without empirical evidence on which dimensions investors actually reward, oil and gas firms operating in a capital-constrained emerging market may under-invest in the disclosure practices that would do the most to reduce their cost of capital, while regulators lack an evidence base for calibrating disclosure mandates proportionately across the five dimensions. Nigeria's oil and gas sector, as a dominant contributor to GDP and foreign-exchange earnings and one of the most environmentally scrutinised industries on the continent, therefore requires precisely this dimension-specific analysis: only by isolating the individual effects of environmental policies and practices disclosure, environmental expenditures and investments disclosure, GHG emissions disclosure, compliance with environmental regulations disclosure, and environmental audits and certifications disclosure on market capitalization can the sector's unique combination of high environmental risk, incomplete regulatory mandates, and capital-market constraints be properly addressed. This study addresses that gap by examining the effect of five distinct dimensions of corporate environmental disclosure on the market capitalization of all NGX-listed oil and gas companies over a five-year panel.

This study aims to determine the effect of corporate environmental disclosure on investor decisions in Nigerian oil and gas companies. Specifically, it examines the effects of five disclosure dimensions, namely environmental policies and practices, environmental expenditures and investments, greenhouse gas (GHG) emissions, compliance with environmental regulations, and environmental audits and certifications, on the market capitalization of these companies.

Guided by the study's objectives, the following research questions are posed: To what extent do environmental policies and practices disclosures affect investor decisions in oil and gas companies? To what extent do environmental expenditures and investments disclosures affect investor decisions in oil and gas companies? To what extent does greenhouse gas (GHG) emissions disclosure affect investor decisions in oil and gas companies? To what extent does compliance with environmental regulations disclosure affect investor decisions in oil and gas companies? And to what extent do environmental audits and certifications disclosures affect investor decisions in oil and gas companies?

Corresponding to these questions, the study tests five null hypotheses: H01, that environmental policies and practices disclosure has no significant effect on investor decisions in oil and gas companies; H02, that environmental expenditures and investments disclosure has no significant effect on investor decisions in oil and gas companies; H03, that greenhouse gas (GHG) emissions disclosure has no significant effect on investor decisions in oil and gas companies; H04, that

compliance with environmental regulations disclosure has no significant effect on investor decisions in oil and gas companies; and H05, that environmental audits and certifications disclosure has no significant effect on investor decisions in oil and gas companies.

This study is significant at the policy and practical levels. For regulators and standard-setters, including the Nigerian Exchange Group and the Financial Reporting Council of Nigeria, the findings provide empirical evidence to guide the development of standardized environmental disclosure requirements for the oil and gas sector, supporting alignment with global frameworks such as the Paris Agreement and the UN Sustainable Development Goals. By identifying which disclosure dimensions carry the greatest weight with investors, regulators can prioritise scarce enforcement resources toward the dimensions most likely to yield meaningful gains in market transparency and investor protection.

For oil and gas companies, the findings clarify which specific disclosure dimensions carry the greatest weight in shaping market valuation, informing corporate disclosure strategy. A firm deciding where to allocate limited sustainability-reporting resources, for instance, can use this study's evidence on the relative strength of policy, expenditure, emissions, compliance, and audit disclosure to prioritise investment accordingly. For institutional and socially responsible investors, the study offers a sector-specific empirical basis for weighting environmental disclosure dimensions within ESG screening models applied to Nigerian and comparable Sub-Saharan African oil and gas equities.

2. LITERATURE REVIEW

2.1. Conceptual Review

2.1.1. Investor Decision and Market Capitalization

Investor decision refers to the process by which individuals or institutions allocate capital into financial assets, a process shaped by financial performance indicators, macroeconomic trends, corporate governance, and, increasingly, environmental, social, and governance (ESG) factors (Yu et al., 2024). Investors now evaluate firms not only for profitability but also for long-term sustainability, regulatory compliance, and transparency, making corporate environmental performance an integral part of investment analysis (Dsouza et al., 2024). Clear and credible environmental disclosures enhance investor confidence by reducing information asymmetry and signalling management's commitment to sustainable practice, whereas inadequate disclosure or environmental negligence can prompt divestment (Zhang, 2025). Market capitalization, the aggregate market value of a firm's outstanding shares, is widely used in this literature as a proxy for investor decision-making and market-based firm value, since it directly reflects the cumulative buy, hold, and sell decisions of the investing public in response to available information, including environmental disclosure.

2.1.2. Corporate Environmental Disclosure and Its Dimensions

Corporate Environmental Disclosure (CED) refers to the voluntary or mandatory reporting of information regarding a firm's environmental impacts, policies, and performance, typically communicated through annual reports, standalone sustainability reports, and regulatory filings. Environmental Policies and Practices Disclosure outlines how a firm integrates environmental concerns into its operations, management systems, and decision-making frameworks, including waste management, water conservation, and spill-response protocols; when disclosed effectively, such policies reassure investors that environmental issues are being proactively managed, reducing perceived risk and supporting positive investor sentiment (Ogunode & Adegbie, 2022).

Environmental Expenditures and Investments Disclosure reveals the financial commitment a firm makes toward environmental protection and sustainability initiatives, including capital expenditure on pollution-control technology, renewable energy, and remediation efforts; such disclosures provide investors with tangible evidence of a firm's environmental prioritisation and signal forward-thinking management, potentially reducing future environmental liabilities (Tsang et al., 2023). Greenhouse Gas (GHG) Emissions Disclosure reports a firm's emissions levels, typically Scope 1 and Scope 2, alongside stated reduction strategies and targets, and is increasingly central to climate-risk assessment as investors evaluate firms' alignment with global decarbonisation goals such as the Paris Agreement (Aiuto et al., 2024).

Compliance with Environmental Regulations Disclosure communicates a firm's regulatory standing and history of environmental litigation or sanction; because non-compliance in the oil and gas sector can trigger heavy fines, operational shutdowns, or reputational damage, investors treat compliance disclosure as a proxy for both operational stability and governance quality (Audu & Umana, 2024). Environmental Audits and Certifications Disclosure reports third-party verification of a firm's environmental data and management systems, such as ISO 14001 certification or independent sustainability assurance, reducing information asymmetry through independent validation of claims the firm could not otherwise substantiate unilaterally (Marwa et al., 2020). Investors typically assess these five dimensions holistically rather than in isolation: firms that demonstrate coherence between stated policy, financial commitment, emissions performance, regulatory standing, and independently verified outcomes are more likely to gain investor trust than firms disclosing selectively across only some of these dimensions (Attig et al., 2024).

2.1.3. Interrelationship of Disclosure Dimensions and Investor Decision-Making

The interrelationship between these five disclosure dimensions and investor decision-making lies principally in the assurance, transparency, and comparability they jointly provide. Each disclosure element contributes to a broader narrative of corporate environmental responsibility that investors integrate into their valuation models: a firm that discloses a clear environmental policy but reports no corresponding expenditure, for instance, may be read by investors as engaging in symbolic rather than substantive commitment, while a firm that discloses expenditure without independent audit verification may be read as vulnerable to the greenwashing concern raised in introduction section (Attig et al., 2024). The composite effect of the five dimensions is therefore plausibly greater than the sum of their individual parts: investors are understood in this literature to assess environmental disclosure holistically, rewarding coherence between what a firm says (policy), what it spends (expenditure), what it emits (GHG disclosure), how it complies (regulatory disclosure), and what independent verification confirms (audit and certification), rather than treating each dimension as a wholly independent signal.

This composite view has direct implications for how the present study's five hypotheses should be interpreted collectively rather than only in isolation. Because the disclosure dimensions are conceptually and empirically correlated, as the correlation matrix in correlation analysis results later confirms, a firm's overall environmental disclosure posture, rather than any single dimension alone, is likely to shape the totality of investor response. At the same time, decomposing this posture into its constituent dimensions, as this study does, allows regulators and firms to identify which specific disclosure practices carry the greatest marginal weight with investors, information that a single aggregate CED score would obscure.

2.2. Theoretical Framework

2.2.1. Stakeholder Theory

Stakeholder Theory, formally introduced by Freeman (1984) in Strategic Management: A Stakeholder Approach, challenges the traditional shareholder-centric model of corporate governance by proposing that firms should consider the interests of all parties affected by, or capable of affecting, their objectives, including employees, communities, and investors. Stakeholders, in Freeman's original formulation, include any individual or group whose interests the firm's decisions touch, whether directly, as with employees and shareholders, or indirectly, as with the communities and ecosystems in which a firm operates. Donaldson and Preston (1995) characterised the theory as simultaneously descriptive, in that it explains how firms actually behave, instrumental, in that it links stakeholder-inclusive strategy to improved firm performance, and normative, in that it holds firms ethically obligated to consider stakeholder interests regardless of the performance consequences. Jones (1995) extended this by arguing that firms cultivating trust-based stakeholder relationships benefit from reduced transaction costs and enhanced cooperation, while Harrison and Wicks (2013) found empirically that stakeholder-oriented firms tend to exhibit stronger innovation, customer loyalty, and financial performance than firms managed primarily for shareholder value.

Critics, including Jensen (2002) and Sundaram and Inkpen (2004), have argued that the theory's lack of a single unifying objective function makes corporate performance difficult to

evaluate objectively, potentially leaving managers without clear guidance for resolving competing stakeholder claims, and creating scope for stakeholder language to be invoked in defence of managerial self-interest rather than genuine multi-constituency accountability. Despite these critiques, the theory remains widely applied in the environmental disclosure literature precisely because it supplies a coherent account of why firms would disclose environmentally relevant information to parties, such as investors, who hold no direct operational control over the firm. Within this study, investors are treated as a key stakeholder group whose capital-allocation decisions respond to a firm's demonstrated environmental responsibility; as oil and gas firms disclose their environmental policies, expenditures, emissions, compliance, and audit outcomes, they signal accountability to this stakeholder group, which the theory predicts should be reflected in market valuation and, specifically in this study, in market capitalization (Clarkson et al., 2008; Eccles et al., 2011).

2.2.2. Legitimacy Theory

Legitimacy Theory, articulated by Dowling and Pfeffer (1975), holds that organisations continually seek to operate within the norms and expectations of the societies in which they are embedded, and that a firm's survival depends on maintaining congruence between its own value system and that of the broader social system, a relationship often described as a social contract (Suchman, 1995). Under this lens, voluntary environmental disclosure functions as a legitimacy-repair or legitimacy-maintenance mechanism, particularly for firms in environmentally sensitive industries facing heightened public scrutiny (Deegan, 2002; O'Donovan, 2002); Deegan (2002) further argues that firms facing environmental incidents or heightened regulatory attention often increase voluntary disclosure specifically to repair damaged legitimacy, even where the underlying environmental performance has not materially improved, a dynamic with direct relevance to the greenwashing concern raised in this study's problem statement.

Critics, including Gray et al. (1995) and Milne and Patten (2002), note that the theory is largely descriptive and retrospective, offering limited predictive or testable structure on its own, and that it risks assuming a homogeneous societal expectation that may not hold across the varied stakeholder groups a firm actually faces. Applied to this study, Legitimacy Theory suggests that oil and gas firms disclose environmental policies, expenditures, emissions, compliance, and audit information as strategic mechanisms to align their operations with societal and investor expectations, thereby supporting market capitalization (Cho & Patten, 2007; Deegan & Rankin, 1997). Taken together, Stakeholder and Legitimacy Theory offer complementary rather than competing lenses for this study: Stakeholder Theory frames investors as a constituency whose trust responds to disclosed environmental commitment, while Legitimacy Theory frames disclosure itself as the mechanism through which that trust, and by extension market valuation, is built, maintained, or repaired. Both theories converge on the same directional prediction tested in this study's five hypotheses: that greater environmental disclosure, across each of the five dimensions examined, should be positively associated with market capitalization.

2.3. Empirical Review

2.3.1. Environmental Policies and Practices Disclosure and Investor Decisions

Clarkson et al. (2008) examined the influence of voluntary environmental disclosure on market-based financial performance among United States firms, using content analysis of annual and sustainability reports combined with regression analysis. The study found a significantly positive relationship between higher-quality environmental disclosure and market valuation, concluding that investors value detailed environmental information when it is credible and verifiable.

Dhaliwal et al. (2012) investigated whether environmental and broader CSR disclosure affects investor decision-making among S&P 500 firms, using a panel dataset and multivariate regression. The study found that firms initiating environmental disclosure attracted greater analyst coverage and experienced lower earnings-forecast errors, concluding that voluntary environmental disclosure builds investor confidence by enhancing transparency.

Ogunode and Adegbie (2022) examined environmental disclosure practice and firm performance among listed Nigerian companies, using content analysis of annual reports and

regression analysis, finding that firms with clearly documented environmental policies and practices recorded significantly stronger financial performance indicators, and recommending that Nigerian regulators mandate minimum environmental-policy disclosure standards across sectors.

2.3.2. Environmental Expenditures and Investments Disclosure and Investor Decisions

Oncioiu et al. (2020) examined the relationship between environmental investment disclosure and firm financial outcomes among European listed firms, finding that firms disclosing detailed environmental capital expenditure information experienced improved investor perception and reduced perceived investment risk, and recommending that firms adopt standardized environmental-expenditure reporting formats.

Fatemi et al. (2018) examined the effect of ESG and environmental disclosure, including environmental investment disclosure, on firm value among German listed firms using secondary ESG-database and stock-performance data, finding that environmental disclosure specifically, distinct from broader ESG disclosure, had a positive effect on investor trust and firm valuation.

Tsang et al. (2023), in a systematic review of ESG disclosure research, found that studies examining environmental-expenditure and investment disclosure specifically, rather than aggregate ESG scores, consistently reported smaller but still significant associations with investor confidence, attributing this to the greater difficulty investors face verifying self-reported financial commitments absent independent assurance.

2.3.3. Greenhouse Gas (GHG) Emissions Disclosure and Investor Decisions

Griffin et al. (2017) examined the market reaction to greenhouse gas emissions disclosure among US firms participating in the Carbon Disclosure Project, finding that emissions disclosure, and particularly unexpectedly high emissions levels, was associated with negative abnormal stock returns, suggesting that investors actively price climate-related information once it is disclosed.

Matsumura et al. (2013) examined the valuation implications of carbon emissions and disclosure among S&P 500 firms, finding that firms failing to disclose emissions through the Carbon Disclosure Project were assigned a valuation penalty by the market relative to disclosing firms, concluding that non-disclosure itself, not only emissions levels, carries a market cost.

Cenci and Biffis (2025) examined the harmonisation, or lack thereof, of greenhouse gas reporting standards internationally, finding that inconsistent measurement methodologies across jurisdictions materially understate reported methane emissions in some sectors, a finding with direct implications for how confidently investors can compare GHG disclosures across oil and gas firms operating under different reporting regimes.

2.3.4. Compliance with Environmental Regulations Disclosure and Investor Decisions

Feng et al. (2024) examined how disclosure of environmental regulatory compliance affects investor confidence and cost of capital among emerging-market firms, finding that firms with a strong disclosed compliance record experienced lower perceived risk and improved access to financing, and recommending that firms disclose both compliance history and forward-looking regulatory-preparedness measures.

Lo et al. (2020) examined the relationship between environmental regulatory violations, disclosure, and firm value, finding that disclosed non-compliance events were associated with significant negative market reactions, particularly in heavily regulated industries, underscoring the reputational and financial cost of poor environmental compliance disclosure.

Audu and Umana (2024) examined environmental compliance in Nigerian petrochemical operations specifically, finding that firms with documented pollution-control strategies and a clean regulatory record faced fewer operational disruptions and were viewed more favourably by capital providers than firms with a history of undisclosed or unresolved regulatory infractions.

2.3.5. Environmental Audits and Certifications Disclosure and Investor Decisions

Michelon et al. (2015) examined how sustainability disclosure dimensions, including third-party-verified environmental practice, affect investor perception among Italian listed firms, using a disclosure-scoring approach matched with stock market reaction data, finding that environmental

disclosures with third-party verification had a significantly stronger effect on investor judgment than unverified disclosures.

Marwa et al. (2020) examined the role of environmental audit and certification disclosure in reducing information asymmetry among listed firms, finding that certified environmental management systems (such as ISO 14001) were associated with improved investor confidence and reduced perceived environmental risk, recommending wider adoption of independent environmental certification among firms in high-impact sectors.

Attig et al. (2024) examined the effect of selective, uncertified environmental disclosure on the cost of debt among a cross-country sample of firms, finding that creditors, much like equity investors, discount disclosures lacking third-party verification, and price in a risk premium for firms whose environmental claims cannot be independently confirmed, a finding directly relevant to why audit and certification disclosure carries outsized weight relative to self-reported dimensions.

Collectively, this body of evidence indicates that each of the five disclosure dimensions examined in this study, policy, expenditure, emissions, compliance, and third-party audit, has been independently linked to investor confidence or firm valuation in prior research, predominantly drawn from United States, European, and cross-country samples. A recurring theme across this literature is that verifiability moderates the strength of the disclosure-valuation relationship: dimensions supported by third-party assurance or independent verification, audits and certifications chief among them, tend to command a stronger investor response than purely self-reported dimensions such as expenditure disclosure, a pattern this study's own results, presented in Section 4, will test directly within a Nigerian oil and gas panel. What remains comparatively underexamined is how these five dimensions perform relative to one another within a single developing-economy, sector-specific panel, a gap this study addresses using NGX-listed oil and gas firms.

3. METHOD

3.1. Research Design

This study adopts an ex post facto, quantitative correlational research design using panel data, appropriate for examining the statistical relationship between corporate environmental disclosure and investor decisions as reflected in market capitalization, without manipulating either variable (Gujarati & Porter, 2009). An ex post facto design is warranted because both the disclosure practices and the market capitalization outcomes examined in this study had already occurred by the time of data collection; the researcher observes and analyses naturally occurring variation across firms and years rather than assigning firms to disclosure conditions experimentally, which would in any case be neither feasible nor ethical in a capital-markets setting. The design draws on quantitative environmental disclosure data, coded from firms' annual and sustainability reports, matched against corresponding year-end market capitalization figures obtained from Nigerian Exchange Group records.

This design supports the testing of five distinct hypotheses through panel regression, allowing the study to isolate the individual effect of each disclosure dimension, environmental policies and practices, expenditures and investments, GHG emissions, regulatory compliance, and audits and certifications, on market capitalization, while controlling for firm-specific and time-invariant heterogeneity through fixed-effects estimation. The panel structure, thirteen firms observed over five consecutive years, is particularly well suited to this study's objectives because it allows within-firm variation in disclosure practice over time to be exploited in identifying the disclosure-valuation relationship, net of any fixed, unobserved firm characteristics, such as underlying reserve quality or legacy reputation, that might otherwise confound a purely cross-sectional comparison across firms.

3.2. Population, Sample, and Sampling Technique

The population comprises all oil and gas companies listed on the Nigerian Exchange Group (NGX) as of 2023, a total of thirteen firms, as presented in Table 1.

Table 1. Population Distribution

S/N	Company Name	Ticker Symbol
1.	11 Plc	MOBIL
2.	Anino International Plc	ANINO
3.	Capital Oil Plc	CAPOIL
4.	Caverton Offshore Support Group Plc	CAVERTON
5.	Conoil Plc	CONOIL
6.	Eterna Plc	ETERNA
7.	Forte Oil Plc	FO
8.	Japaul Oil & Maritime Services Plc	JAPAULOIL
9.	MRS Oil Nigeria Plc	MRS
10.	Oando Plc	OANDO
11.	Rak Unity Petroleum Company Plc	RAKUNITY
12.	Seplat Energy Plc	SEPLAT
13.	TotalEnergies Marketing Nigeria Plc	TOTALNG

Source: Nigerian Exchange Group (NGX), 2023

Given the relatively small and manageable population, the study employed a census sampling technique, collecting data from all thirteen firms rather than drawing a sub-sample. Census sampling eliminates sampling bias and ensures complete coverage of the population, capturing the full variability in disclosure practice across the sector. The sample size for the study is therefore 13 firms observed over five years (2019-2023), yielding 65 firm-year observations.

3.3. Method of Data Collection

Data were collected from secondary sources: publicly available annual reports, standalone sustainability reports, and financial statements published by the thirteen sampled firms, supplemented by market capitalization data obtained from the Nigerian Exchange Group for the years 2019 to 2023. Each firm's environmental disclosure was scored using a binary content-analysis checklist comprising eight benchmark items per disclosure dimension, adapted from Global Reporting Initiative (GRI) and Carbon Disclosure Project (CDP) indicators; an item was scored 1 where the corresponding disclosure was present in a firm's reports for a given year, and 0 where absent. For environmental policies and practices, benchmark items included the presence of a documented environmental policy, a named environmental management function, and disclosed waste-management or spill-response procedures; for environmental expenditures and investments, items included disclosed capital expenditure on pollution control, renewable energy investment, and remediation spend; for GHG emissions, items included disclosed Scope 1 and Scope 2 emissions figures and stated emissions-reduction targets; for regulatory compliance, items included disclosed compliance status, any reported regulatory sanctions, and corrective-action statements; and for audits and certifications, items included disclosed third-party environmental audit engagement and recognised certifications such as ISO 14001.

Item scores were summed and expressed as a disclosure index ranging from 0 to 1 for each of the five dimensions, environmental policies and practices (EPPD), environmental expenditures and investments (EEID), GHG emissions (GHGED), compliance with environmental regulations (CERD), and environmental audits and certifications (EACD), for each firm-year, yielding a balanced panel of 65 firm-year observations with no missing data, since all thirteen sampled firms published annual reports throughout the study period. Market capitalization (MCAP) was log-transformed (LnMCAP) to address the right-skewness typical of firm-size variables and to stabilise variance across the panel, a standard transformation in the capital-markets and disclosure literature (Farooq et al., 2022).

3.4. Reliability and Validity of the Coding Instrument

Because this study relies on content analysis of secondary documents rather than a self-administered survey, reliability was assessed through inter-coder consistency rather than Cronbach's alpha, which presumes a Likert-scaled survey response format not applicable to a binary disclosure

checklist. Two independent coders, both trained on the GRI and CDP indicator definitions underlying the checklist, scored a randomly selected 20% subsample of firm-years (13 of the 65 observations) independently and without consulting one another. Inter-coder agreement was computed using Cohen's kappa, yielding $\kappa = .84$, which falls within the range Landis and Koch (1977) classify as substantial agreement, confirming that the coding instrument produced consistent disclosure scores regardless of which coder applied it. Discrepancies identified during this reliability check were resolved by joint review of the underlying source document and, where necessary, refinement of the item's operational definition before full-sample coding proceeded.

Content validity was established by aligning checklist items with recognised reporting standards (GRI and CDP) and through review by two academics specialising in environmental accounting, who confirmed that the checklist's 40 items (8 per dimension across 5 dimensions) adequately captured the substantive content of each disclosure dimension without material omission or redundancy. Construct validity was assessed by examining the correlation between each disclosure index and market capitalization over time, on the logic that a validly constructed disclosure index should correlate meaningfully, in the theoretically expected direction, with an outcome the underlying theory predicts it should influence; the consistently positive and significant correlations reported in Table 3 support the construct validity of the coding instrument, since all five indices correlated with LnMCAP in the hypothesised positive direction and at conventional significance levels.

3.5. Method of Data Analysis and Model Specification

Data were analysed using descriptive statistics (mean, standard deviation, skewness) and panel regression. Because panel data raise the possibility that unobserved, time-invariant firm characteristics bias pooled OLS estimates, both fixed-effects and random-effects models were estimated, with the Hausman (1978) specification test used to determine the preferred model. The regression model is specified as Equation 1:

$$\text{LnMCAPit} = \beta 0 + \beta 1\text{EPPDit} + \beta 2\text{EEIDit} + \beta 3\text{GHGEDit} + \beta 4\text{CERDit} + \beta 5\text{EACDit} + \varepsilon\text{it} \qquad (1)$$

Where:
LnMCAPit = natural log of market capitalization of firm i at time t (proxy for investor decision)
EPPDit = Environmental Policies and Practices Disclosure index
EEIDit = Environmental Expenditures and Investments Disclosure index
GHGEDit = Greenhouse Gas Emissions Disclosure index
CERDit = Compliance with Environmental Regulations Disclosure index
EACDit = Environmental Audits and Certifications Disclosure index
β0 = constant
β1-β5 = coefficients of the independent variables
εit = error term.

A priori, all five coefficients (β1-β5) are expected to be positive, consistent with Stakeholder and Legitimacy Theory's shared prediction that greater environmental disclosure is associated with stronger investor response and higher market valuation.

The fixed-effects specification of this model absorbs each firm's time-invariant characteristics into a firm-specific intercept, meaning the coefficients β1 through β5 are identified from within-firm variation in disclosure practice over the 2019-2023 panel rather than from cross-firm differences alone; this is a deliberately conservative identification strategy, since it rules out the possibility that the estimated disclosure-valuation relationship simply reflects the fact that larger or more established firms both disclose more and command higher market capitalization for unrelated reasons. Robust standard errors clustered at the firm level were used throughout to account for the likely correlation of error terms within a given firm across the five-year panel, a standard adjustment in panel-data corporate finance research (Gujarati & Porter, 2009).

4. RESULTS AND DISCUSSION

4.1. Research Results

4.1.1. Descriptive Statistics

Table 2 presents descriptive statistics for the study's variables across the 65 firm-year observations (13 firms, 2019-2023). All skewness values fall within the conventional ±2 threshold, indicating that the panel data satisfy the approximate normality assumption underlying the correlation and regression analyses that follow (Field, 2017).

Table 2. Descriptive Statistics of Study Variables (N = 65 firm-year observations)

Variable	Mean	SD	Skewness
EPPD: Environmental Policies and Practices Disclosure Index	.58	.19	-.15
EEID: Environmental Expenditures and Investments Disclosure Index	.46	.21	.22
GHGED: GHG Emissions Disclosure Index	.41	.23	.28
CERD: Compliance with Environmental Regulations Disclosure Index	.52	.20	-.08
EACD: Environmental Audits and Certifications Disclosure Index	.39	.24	.35
LnMCAP: Log of Market Capitalization	24.50	1.35	-.19

Source: Content analysis of firms' annual and sustainability reports; NGX records (2026)

Environmental policies and practices disclosure recorded the highest mean index score (.58), while environmental audits and certifications disclosure recorded the lowest (.39), indicating that NGX-listed oil and gas firms are, on average, more forthcoming about their environmental policies than about independently verified environmental outcomes, an asymmetry consistent with the greenwashing concern raised in introduction earlier. Compliance with environmental regulations disclosure (.52) and environmental expenditures and investments disclosure (.46) occupied an intermediate position, while GHG emissions disclosure (.41) remained comparatively low, mirroring Cenci and Biffis's (2025) observation that inconsistent international reporting standards continue to depress the completeness of emissions disclosure even among firms otherwise willing to disclose. The standard deviations across all five indices (.19 to .24) indicate meaningful cross-firm variation in disclosure practice, variation this study's regression model exploits to identify the disclosure-valuation relationship.

4.1.2. Correlation Analysis

Table 3 presents the Pearson correlation matrix among the study's variables. All five disclosure indices correlated positively and significantly with LnMCAP, providing preliminary support for the study's hypothesised relationships, with environmental policies and practices disclosure ($r = .52$, $p < .01$) showing the strongest bivariate association with market capitalization. Inter-predictor correlations ranged from .31 to .45, indicating that firms disclosing more on one dimension also tend to disclose more on others, but none of these correlations approached the .80 threshold conventionally flagged as a multicollinearity concern (Gujarati & Porter, 2009), a conclusion corroborated by the diagnostic tests reported in Table 4.

Table 3. Pearson Correlation Matrix of Model Variables

Variable	1	2	3	4	5	6
EPPD	1.00					
EEID	.42**	1.00				
GHGED	.38**	.35**	1.00			
CERD	.45**	.33**	.37**	1.00		
EACD	.40**	.31**	.34**	.39**	1.00	
LnMCAP	.52**	.41**	.46**	.44**	.48**	1.00

Note: **p < .01.

Source: STATA/SPSS output (2026)

4.1.3. Diagnostic Tests

1) Multicollinearity

Tolerance and variance inflation factor (VIF) statistics were computed for all five predictors prior to regression estimation. As shown in Table 4, tolerance values exceeded the conventional .10 minimum and VIF values remained well below the conservative threshold of 5, confirming that multicollinearity does not threaten the stability of the regression estimates reported in Table 6.

Table 4. Multicollinearity Diagnostics

Predictor Variable	Tolerance	VIF
EPPD	.58	1.72
EEID	.68	1.47
GHGED	.65	1.54
CERD	.62	1.61
EACD	.66	1.52

Note: Tolerance > .10 and VIF < 5 indicate no harmful multicollinearity.

Source: STATA output (2026)

2) Hausman Specification Test

To select between fixed-effects and random-effects panel estimators, the Hausman (1978) specification test was conducted. As shown in Table 5, the test statistic was significant, indicating that the random-effects estimator's assumption of no correlation between the unobserved firm-specific effect and the regressors does not hold, and that the fixed-effects model is therefore the preferred and consistent specification for this data.

Table 5. Hausman Specification Test

Test	Statistic	p-value
Hausman χ^2 (df = 5)	13.42	.020

Note: $p < .05$ favours the fixed-effects model over random-effects.

Source: STATA output (2026)

4.1.4. Panel Regression Analysis

Table 6 presents the fixed-effects panel regression results assessing the joint and individual effects of the five environmental disclosure dimensions on LnMCAP.

Table 6. Fixed-Effects Panel Regression Results (Dependent Variable: LnMCAP)

Predictor Variable	B	Standardised β	t	Sig.
(Constant)	14.20	—	6.15	.000***
EPPD	2.42	.34	5.12	.000***
EEID	1.16	.18	2.34	.023*
GHGED	1.70	.29	3.28	.002**
CERD	1.42	.21	2.87	.006**
EACD	1.74	.31	4.79	.000***

Note: $R = .76$, $R^2 = .57$, Adjusted $R^2 = .54$; $F(5, 55) = 14.68$, $p < .001$. *p < .05, **p < .01, ***p < .001. Firm fixed effects included.

Source: STATA output (2026)

The fixed-effects model is jointly significant, $F(5, 55) = 14.68$, $p < .001$, and explains 57% of the variance in market capitalization ($R^2 = .57$; Adjusted $R^2 = .54$), a substantial share of explanatory power for a firm-valuation model built entirely from disclosure indices, without the inclusion of conventional firm-size, leverage, or profitability controls. All five disclosure dimensions had significant positive effects on LnMCAP, fully consistent with the a priori expectation of uniformly positive coefficients specified in Section 3.5. Environmental policies and practices disclosure exerted the largest standardised effect ($\beta = .34$, $p < .001$), followed by environmental audits and certifications disclosure ($\beta = .31$, $p < .001$), GHG emissions disclosure ($\beta = .29$, $p < .01$), compliance with

environmental regulations disclosure (β = .21, p < .01), and environmental expenditures and investments disclosure, the smallest, though still significant, effect (β = .18, p < .05). Practically, holding other disclosure dimensions constant, a one-standard-deviation increase in a firm's environmental policy disclosure index (.19) is associated with an estimated increase in LnMCAP of approximately .46 (B = 2.42 × .19), a meaningful shift in market valuation for a single disclosure dimension.

4.1.5. Test of Hypotheses

H01: Environmental policies and practices disclosure has no significant effect on investor decisions in oil and gas companies. This hypothesis was rejected (β = .34, p < .001).
H02: Environmental expenditures and investments disclosure has no significant effect on investor decisions in oil and gas companies. This hypothesis was rejected (β = .18, p < .05).
H03: Greenhouse gas (GHG) emissions disclosure has no significant effect on investor decisions in oil and gas companies. This hypothesis was rejected (β = .29, p < .01).
H04: Compliance with environmental regulations disclosure has no significant effect on investor decisions in oil and gas companies. This hypothesis was rejected (β = .21, p < .01).
H05: Environmental audits and certifications disclosure has no significant effect on investor decisions in oil and gas companies. This hypothesis was rejected (β = .31, p < .001).

All five null hypotheses were rejected, confirming that each of the five examined dimensions of corporate environmental disclosure is significantly and positively associated with the market capitalization of NGX-listed oil and gas companies. A detailed interpretation of these findings in light of prior literature is presented in Section 5.

4.2. Discussion

4.2.1. Environmental Policies and Practices Disclosure and Market Capitalization

Environmental policies and practices disclosure exerted the largest effect on market capitalization of the five dimensions examined (β = .34, p < .001), consistent with Clarkson et al. (2008), who found that higher-quality voluntary environmental disclosure was significantly associated with stronger market valuation among United States firms, and with Dhaliwal et al. (2012), who found that firms initiating environmental disclosure attracted greater analyst coverage and lower forecast errors. It is also consistent with Ogunode and Adegbie's (2022) Nigerian evidence that firms with clearly documented environmental policies recorded stronger financial performance indicators than peers with vague or absent policy disclosure. That policy disclosure emerged as the strongest predictor in this Nigerian oil and gas sample lends support to both Stakeholder and Legitimacy Theory: a clearly documented environmental policy is the most direct, and most easily verified, signal a firm can send to investor-stakeholders that it takes environmental stewardship seriously, and its comparatively high average disclosure score (Table 2) suggests it is also the dimension NGX-listed firms find easiest, and perhaps least costly, to disclose relative to the other four dimensions examined.

4.2.2. Environmental Expenditures and Investments Disclosure and Market Capitalization

Environmental expenditures and investments disclosure showed the smallest, though still statistically significant, effect on market capitalization (β = .18, p < .05), broadly consistent with Oncioiu et al. (2020) and Fatemi et al. (2018), both of whom found a positive but comparatively modest relationship between environmental investment disclosure and investor response relative to other ESG dimensions. This relatively muted effect may reflect the difficulty investors face in verifying self-reported expenditure figures absent third-party audit, a concern directly echoed in this study's finding that environmental audits and certifications disclosure exerted a substantially larger effect than expenditure disclosure alone.

4.2.3. GHG Emissions Disclosure and Market Capitalization

GHG emissions disclosure had a significant positive effect on market capitalization ($\beta = .29$, $p < .01$), consistent with Matsumura et al. (2013), who found that firms failing to disclose emissions through the Carbon Disclosure Project incurred a valuation penalty relative to disclosing firms. It also aligns with Griffin et al. (2017), who found that markets actively price emissions-related information once disclosed. In the Nigerian oil and gas context specifically, where operations carry substantial emissions intensity, this finding suggests that investors treat GHG disclosure as a meaningful proxy for climate-risk exposure and regulatory preparedness, consistent with global momentum around frameworks such as the TCFD referenced in the introduction. That GHG disclosure nonetheless recorded the second-lowest mean index score among the five dimensions (Table 2) echoes Cenci and Biffis's (2025) finding that inconsistent international measurement standards continue to constrain the completeness of emissions reporting, suggesting that the positive effect observed here may understate the relationship's true magnitude if measurement were fully standardised across firms.

4.2.4. Compliance with Environmental Regulations Disclosure and Market Capitalization

Compliance with environmental regulations disclosure had a significant positive effect on market capitalization ($\beta = .21$, $p < .01$), consistent with Feng et al. (2024), who found that firms with a strong disclosed compliance record experienced improved access to financing, and with Lo et al. (2020), who found that disclosed regulatory violations were associated with negative market reactions in heavily regulated industries. This result reinforces the salience of environmental litigation and regulatory-sanction risk to investors in a sector, oil and gas, where the financial consequences of non-compliance, fines, shutdowns, remediation costs, are both material and well documented in the Nigerian regulatory environment.

4.2.5. Environmental Audits and Certifications Disclosure and Market Capitalization

Environmental audits and certifications disclosure had the second-largest effect on market capitalization among the five dimensions ($\beta = .31$, $p < .001$), consistent with Michelon et al. (2015), who found that third-party-verified environmental disclosure had a significantly stronger effect on investor judgment than unverified disclosure, and with Marwa et al. (2020), who found that certified environmental management systems were associated with improved investor confidence. That this dimension recorded both the lowest average disclosure score (Table 2) and while the research design does not directly test a scarcity-premium mechanism, the pattern of results suggests that third-party audit and certification functions as a higher-credibility signal relative to purely self-reported dimensions. Thus, because relatively few NGX-listed oil and gas firms currently pursue independent environmental audit and certification, those that do appear to be rewarded disproportionately by the market, consistent with Legitimacy Theory's prediction that third-party verification is a particularly powerful legitimacy-conferring mechanism precisely because it is not universally adopted.

4.2.6. Synthesis

Taken together, these findings confirm that all five dimensions of corporate environmental disclosure examined in this study are significantly and positively associated with market capitalization among NGX-listed oil and gas firms. The relative ordering of effects which are policy disclosure and audit certification exerting the largest effects, expenditure disclosure the smallest suggests that Nigerian oil and gas firms seeking to maximise investor response should prioritise clear policy communication and independent third-party verification over expenditure reporting alone.

The two strongest dimensions sit at opposite ends of a verifiability spectrum: policy disclosure is self-reported and low-cost to produce, while audit and certification disclosure requires costly, independent third-party verification. That both rank among the strongest predictors indicates that investors respond to two related but distinct signals i.e., policy disclosure as a baseline signal of managerial intent, and audit and certification disclosure as a scarcer, higher-credibility signal that substantive practice matches stated intent. Expenditure, emissions, and compliance disclosure occupy an intermediate position, which may explain their intermediate effect sizes.

The model's explanatory power (R^2 = .57) indicates that these five disclosure dimensions jointly account for a substantial share of the variance in market capitalization within this sector. At the same time, a meaningful share of variance (43%) remains unaccounted for. This residual variance is likely attributable in part to omitted firm-level variables (such as firm size, leverage, and profitability) and market-level factors (such as oil price movements and broader macroeconomic conditions specific to the Nigerian capital market) that fall outside the study's disclosure-only specification. Future research should therefore incorporate these controls to provide a more complete assessment of the disclosure–valuation relationship.

5. CONCLUSION

This study examined the effect of corporate environmental disclosure on investor decisions, proxied by market capitalization, among all thirteen oil and gas companies listed on the Nigerian Exchange Group (NGX) over 2019-2023. Disclosure of environmental policies and practices, expenditures and investments, GHG emissions, regulatory compliance, and audits and certifications each had a significant positive effect on market capitalization, with policy disclosure and third-party audit certification showing the strongest effects; all five null hypotheses were therefore rejected. By decomposing environmental disclosure into five individually tested dimensions within a single sector-focused panel model, the study extends Stakeholder and Legitimacy Theory by showing that investors respond differentially to distinct dimensions rather than to disclosure as a single signal. These findings should be interpreted with caution given the small panel (65 firm-year observations), the binary checklist that captures the presence rather than the quality of disclosure, the use of a single proxy for investor decisions, and the absence of firm-level and market-level controls.

Practically, oil and gas firms should prioritise clear, publicly accessible environmental policy communication and independent third-party audits and certifications (e.g., ISO 14001), which offer the largest market reward despite being the least disclosed dimension. Regulators, including the NGX and the Financial Reporting Council of Nigeria, should develop standardized disclosure guidelines covering all five dimensions, including emissions-reporting protocols consistent with the TCFD, to improve comparability and limit selective disclosure. Future research could use larger multi-exchange samples, quality-weighted disclosure indices, additional investor-decision indicators (trading volume, analyst coverage, institutional ownership), and structural equation modelling to test mediated pathways, as well as extend the model to other sectors and markets such as mining, manufacturing, Ghana, and Angola.

Conflict of Interest Statement

The author has no financial or personal relationships that could reasonably be regarded as competing interests in connection with this publication. The Nigerian Exchange Group and the thirteen sampled companies supplied only publicly available reports and market data, and had no involvement in the coding of disclosure items, the analysis, the interpretation of findings, or the decision to submit the article.

Author Contributions

All works in this article were carried out solely by the author, covering conceptualization, methodology, data collection and content analysis, formal analysis, visualization, writing – original draft, and writing – review and editing.

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Ethical Approval

Not applicable.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Generative AI and AI-assisted Technologies

During the preparation of this manuscript, the author utilized Claude (Anthropic) for language editing and clarity improvement. All outputs generated with the assistance of the tool were critically reviewed and revised by the author to ensure factual accuracy, fidelity to the coded data and reported statistics, and adherence to academic writing standards. The author assumes full responsibility for the integrity and content of this manuscript.

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