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ENVIRONMENTAL RESTORATION COSTS DISCLOSURES AND INVESTORS' BEHAVIOUR IN THE OIL AND GAS FIRMS IN NIGERIA

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Abstract

The disclosure of environmental remediation costs usually sends signal to the stakeholders of how responsible the firm is. This study was therefore conducted to investigate the relationship between disclosure of remediation costs and the behaviour of investors in the capital market. The independent variable of the study was the environmental remediation costs disclosure which was proxied by environmental clean costs disclosure, waste management cost disclosure, environmental safety costs disclosure, community development cost disclosure and pollution control cost disclosure; while the dependent variable was the investor's behaviour which was proxied by market capitalisation. The population of the study comprised of nine (9) listed oil and gas firms in the Nigerian Exchange Group as at 2023 of which the whole population was used for the study. The study adopted ex post facto research design as data were obtained from published financial statements of the selected firms for the years' 2014 to 2023 using contents analysis. The data were analysed with descriptive statistics, correlation and regression using SPSS version 10. The results of analysis indicate that environmental clean-up costs disclosure and waste management costs disclosure shows significant positive relationship with market capitalisation while environmental safety costs disclosure and community development cost disclosure show insignificant negative relationship with market capitalisation. It was concluded that the disclosure of remediation

costs have significant relationship with investor's behaviour in the capital market. Arising from the findings and conclusion of the study, it was recommended, amongst others, that oil and gas firms should not only prioritize the restoration of the environment but should also disclose the costs of such restoration in order to project their image to the stakeholders.

Keywords:

Remediation cost disclosure, investors' behaviour, market capitalisation, waste management cost disclosure.

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INTRODUCTION

Restoration of environment by firms has become a cardinal responsibility of companies and it is of interest not only to local communities but also to outside stakeholders. This stems from the fact that activities of firms, particularly oil and gas firms have created very serious negative impact on the environment. In the past environments were exploited and left unattended to by firms. However, in recent times through the activities or advocacies of non-governmental organisations and other stakeholders, the attention of the global community has been directed to how the environment can be replenished and restored for the future generation. Consequently, firms have been under pressure by stakeholders to show their efforts in restoring the environment in order for future generation to inherit.

Firms usually communicate to stakeholders their contributions to the environment through disclosure in annual reports and accounts. The oil and gas industry and others whose activities are directly or indirectly affected by the environment and who affect the environment by their activities have come under examination for their environmental impact and disclosure practices. As documented by Nwachukwu and Chinedu-Eze (2020) the environmental consequences associated with oil extraction and production in Nigeria cannot be ignored. Consequently, Okolie, et al, (2020) drew attention to the instances of oil spills, flaring, and deforestation which have raised serious concerns among stakeholders both locally and internationally, leading to the demands for greater transparency and accountability from the operators of oil and gas firms in Nigeria.

The various environmental degradation activities have compelled firms to invest huge sums of money to address the environmental problems created by the firms. These invested amounts are what constitute environmental restoration costs. Environmental restoration or remediation costs include funds expended on such activities like following laws about the environment, fixing pollution problems, and paying fines for breaking the rules (Okafor, 2018). But sometimes, companies don't think about how their activities are hurting nature when they figure out how much returns the firms are making. This can lead to mistakes and make it seem like companies are generating more returns than they really are. In another

development even when some firms are committing huge sums of money into the replenishment of the environment, they are rarely not recognized because the information is not usually in the public purview. Thus the need to publicly disclose such financial commitment of firms in their annual reports have become imperative.

The various sections of Nigeria as a nation have been the center of numerous environmental disasters occasioned by oil spills (caused by pipeline leakages and illegal oil bunkering), construction activities, manufacturing activities and processing activities. These incidents have led to immense damage to the region's fragile ecosystems leading to contamination of water bodies resulting in severe health consequences for local communities (Agbonkhese, et al, 2019). Such events have not only highlighted the urgency of addressing environmental issues but also emphasized the need for transparent reporting and accountability within the oil and gas sector.

The international and local investors as well as financial institutions have recognized the importance of sustainable investments which incorporate environmental, social, and governance (ESG) factors into their decision-making processes. The growing demand for responsible investments has led to increased investigation into the companies' environmental practices and their disclosure of such information. Due to the complexities of investment decision, investors are now seeking for additional reliable and verifiable environmental data to make informed investment decisions and mitigate risk. Adegbite, et al, (2020) explored the relationship between corporate environmental information disclosure and market value in Nigeria's oil and gas sector. Their findings indicated a positive correlation between environmental information disclosure and market value, highlighting the importance of transparent reporting on environmental issues in enhancing firm performance and investor sentiment.

Though there are various studies which have investigated the impact of environmental information disclosure practices generally in the Nigerian oil and gas sector, most of the findings have been sketchy and inconclusive. Some found a significant relationship between environmental information disclosure and market value of oil and gas firms (Okpo, et al, 2024; Aliyu, et al, 2022; other have found negative relationship (Oraka & Egbumike,2016) and others reveal mixed results (Solomon, 2020). Thus further investigation of the impact of environmental information disclosure on the market value of listed oil and gas firms in Nigeria is warranted. The inadequate disclosure of environmental information by listed oil and gas firms has become a critical issue, as it affects not only the natural environment but also their market value and reputation. The lack of comprehensive and standardized environmental information disclosure practices within the Nigerian oil and gas sector hinder stakeholders from accurately assessing the environmental performance of listed firms. Consequently, this uncertainty has contributed to instability in the market values of companies that fail to disclose their environmental practices adequately.

The absence of consistent environmental reporting guidelines and regulations in Nigeria creates a fragmented landscape, making it challenging for investors to compare and evaluate the environmental performance of different firms (Adewumi, 2019). This lack of harmonization raises concerns about information accuracy, reliability, and comparability,

negatively impacting investor confidence. Secondly, inadequate environmental disclosures diminish the ability of investors and financial institutions to assess the long-term sustainability of oil and gas firms. Without complete and reliable information, investors may struggle to identify potential risks associated with regulatory non-compliance, resource depletion, or climate change impacts (Dietz & Mulder, 2016). Consequently, this uncertainty can contribute to reduced interest in oil and gas companies that fail to disclose their environmental remediation costs adequately.

Although several studies have examined the relationship between environmental disclosure and firm value, there is a noticeable gap in literature concerning research on the relationship between environmental remediation cost disclosures and investors' behaviour in the oil and gas firms in Nigeria. To bridge the gap in existing literature, this research study was conducted to examine and shed light on how environmental remediation costs disclosure will motivate investors to desire to invest in the Nigerian oil and gas firms with particular emphasis on the remediation costs of waste management, clean-up and employee safety, health and community development. By addressing this problem, the study aims to provide valuable insights for policymakers, investors, and industry stakeholders in fostering sustainable practices and enhancing the overall performance and reputation of the sector. This study demonstrates empirical relationship between environmental remediation cost disclosure and investor's behaviour.

Review of Literature

Environmental restoration costs disclosure

Environmental restoration can also be called environmental replenishment, environmental conservation, environmental protection as well as environmental remediation. It involves the process of removing, reducing, or neutralizing pollutants or contaminants in soil, water and air to safeguard human health and the environment. This process encompasses actions such as the removal of pollution from environmental media like soil, groundwater, sediment, or surface water. Aremu and Adegbie (2024) document that environmental conservation cost is used to describe the sum of money spent on operations that aim to protect the environment, such as disaster preparedness, damage mitigation, and restoration. In the same vein Ajah and Adegbie (2023) refers to environmental conservation cost as the money a business puts into non-current assets for the benefits of the environment. Environmental costs include prevention cost which is the cost associated with the prevention of natural disasters, accumulation of harmful waste, recycling of waste products, training of employees, funding of environmental research and fines or penalties for violation of regulations, laws and standards.

The benefits of environmental remediation are multifaceted, including the protection of human health and the environment, restoration of contaminated land for reuse, improvement of air and water quality, and preservation of natural resources, which ultimately enhance economic development opportunities (UNEP, 2016). The environmental remediation costs encompasses the totality of costs involved in the remediation and restoration of environmental costs. Adejola (2013) as cited in Okere et al., (2022) categorized environmental costs as capital or recurrent which are incurred by a firm to ensure that

organizations' activities do not cause harm to the environment or replenishment damage to the environment resulting from the firm's activities. In Nigeria, environmental remediation is a significant concern due to pollution and contamination resulting from activities such as oil spills, gas flaring, and improper waste disposal (UNDP, 2017). Initiatives like the establishment of the National Oil Spill Detection and Response Agency (NOSDRA) in 2006 and projects like the Ogoni Cleanup Project demonstrate the Nigerian government's efforts to address environmental degradation. However, the challenges have persisted and many communities continue have continued to suffer adverse effects, indicating the need for more effective and timely remediation efforts (UNDP, 2017).

Environmental remediation costs disclosure refers to the disclosure of information relating to the costs incurred in remediating or restoring the environment. It encompasses making information available publicly on the costs incurred by firms in restoring the environment. Mostly these are usually publicized in the annual reports and accounts of firms. Agubosim (2021) documents that in the face of multiple environmental problems, responsible organisations operating in the environment tend to incur reasonable costs geared towards sustaining the continuity of the resources of the environment needed by future generations. These costs have been the yardstick or performance evaluation over corporate responsibility and now duty bound to be incorporated in the company's annual reports.

Waste management cost disclosure

Waste management cost disclosure can be described as the disclosure of information regarding the disclosure of information in annual reports about the totality of costs incurred by organisations to manage and control waste material emanating from the activities of the firm. The importances of disclosing information about waste are numerous. Fist and most importantly is to communicate to interested stakeholders that the firm is socially responsible by incurring cost on waste management so as to remediate the environment. The effect of this is to motivate the investors to desire to invest in the firm.

Environmental clean-up cost disclosure

This can be seen as the disclosure of information in annual reports and accounts of firms about the costs incurred by firms in mopping up the environmental mess generated by the activities of the firm. Environmental clean-up cost includes expenses related to the removal and remediation of hazardous materials and pollutants from the environment, covering activities like site investigation, clean-up design, monitoring, and post-clean-up actions. Clean-up costs vary based on contamination type and extent, site accessibility, and clean-up complexity (U.S. EPA, 2021). In Nigeria, factors influencing clean-up costs include contamination severity, site accessibility, resource availability, and legal frameworks (Olatunde et al., 2019; Osunyikanmi, 2021). While clean-up efforts offer benefits such as human health protection, environmental restoration, and economic and social advantages, challenges like limited resources and weak regulatory enforcement persist (Freedman & Shehadeh, 2019; Olatunde et al., 2019).

Environmental safety cost disclosure

Environmental safety cost disclosure refers to disclosure of information regarding expenses associated with preventing, mitigating, and remediating environmental risks to ensure human health and environmental protection (EPA, 2022). These costs include implementing management systems, conducting impact assessments, monitoring environmental parameters, and implementing pollution control measures (EPA, 2022).

In Nigeria, environmental safety is crucial given such challenges as air, water, and soil pollution, as well as inadequate hazardous waste management (Oyewole et al., 2020). Although the government has enacted regulations like the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act, weak enforcement remains an issue, necessitating collaborative efforts to improve environmental safety (Federal Republic of Nigeria, 2007).

Community development costs disclosure

Firms usually contribute to the development of communities in which they operate as a very important aspect of corporate social responsibility. This is important because it is that aspect that ensures that the firms enjoy some reasonable level of peace. Tom and Attai (2014) as cited in Kornom-Gbaraba (2025) define community development as the process by which individuals, organisations, governments and private citizens work together to help a community reach its full potential, become more self-assured, and lead morally and purposefully lives as demonstrated by improvement in standard of living and quality of life. The relationship between the oil and gas firms have been anything but cordial. This is due to incessant demands from the communities in which the firms operate. Thus many companies initiate community relations by establishing company community relations initiate in order to breach the gap between them and the oil and gas firms. To sustain the activities of this body, firms usually channel some funds to address the needs of the community in such areas as pipe borne water, sanitation and others. These costs constitute the community relations costs. A study by Yusuf and Dandago (2023) revealed the existence of the positive relationship between community relations cost disclosure and firm's value. Their findings highlighted the importance of community relations cost disclosure in shaping the market value of firms.

Pollution control cost disclosure

Pollution arises most of the times from the activities of companies. Also the pollution are waste which originate from the activities of companies. Pollution control cost represents expenses incurred by firms in controlling pollution that arises as a result of the activities of the companies. Thus pollution control cost disclosure is the process by which companies report or disclose in annual reports and accounts the expenses incurred in curtailing the effect of pollution on the environment. It involves the expenses incurred by companies to mitigate the effect of pollution arising from the activities of the companies. According to Dissanayake et al (2019) as cited in Oshiole (2024) defines environmental pollution as any activity, by companies or individuals, which compromises the health and/or environment of other persons in a localized area, where the causal link is clearly established. Oshiole (2024) describes

pollution control as an essential task where waste products enter the environment in various forms and threaten the quality of air, land, and water.

Onyema et al (2025) documents that pollution control disclosure is the disclosure strategies to increase the information needed for pollution control of the environment. The information is meant to be disclosed for public consumption on how the environmental pollution are controlled in the interest of the public. It can also be defined as the disclosure of the process of reducing waste and control its impact on the environments (Victoria et al, 2022).

Overview of investor's behaviour in the capital market

Investors' behaviour can be seen as the exploration of the emotional responsiveness pertaining to attitude exhibited by individuals, financial experts, and traders during the financial planning and investment management process (Baker & Ricciardo, 2014). The decision making process of investors incorporates both quantitative (objective) and qualitative (subjective) aspects that is based on the features of investment product or financial services. Generally, the behaviour of investors flow from the psychological and emotional perception above all other considerations. Investment in the capital market involves committing the resources of individuals or organisations to projects that are long term in nature and whose returns accumulate gradually over time. Errors arising from decisions leading to investment in any firm may threaten the survival of such organisations and consequently thorough appraisal of such investment must be carried before embarking on it.

The investors are usually considered to be rational with the objective of maximizing their wealth. Consequently, their investment strategies are anchored solely on risk-return trade-off and in strict compliance with basic finance rules. Investors usually take many factors into consideration in their investment decisions. Hussein (2007) argued that investors usually consider the marketability of the firm's stock, get rich syndrome of investors, expectations of corporate returns, past performances of the firm's stock, government interest and availability of organized financial markets in their decision to invest in any company stock.

There are various methods of measuring the behaviour of investors in the capital markets. However, this study will adopt market capitalisation in line with the prior studies of Okpo (2024). This is because market capitalisation has been found to be the most realistic considering that it is coming from the market.

Market capitalization

Market capitalization represents the total value of a company's outstanding shares of stock, calculated by multiplying the current market price per share by the total number of shares outstanding. It is a key metric used by investors and analysts to assess the size, financial performance, and overall worth of a firm. The concept of market capitalization is crucial when considering the environmental information disclosure of listed oil and gas firms in Nigeria. When companies voluntarily or mandatorily disclose information regarding their environmental performance, such as emissions, waste management practices, and compliance with environmental regulations, it affects how investors perceive the firm's environmental risks and opportunities management. Studies by Ijeoma and Uwuigbe (2020) found a positive relationship between environmental information disclosure and market capitalization. Their

findings imply that companies that disclose environmental information are seen as more transparent, responsible, and better positioned to proactively manage environmental risks, leading to an increase in market capitalization.

Theoretical framework

This study was anchored on stakeholder theory propounded by R. Edward Freeman in 1984. The theory identifies that organizations have a responsibility to consider the interests and concerns of various stakeholders, including investors, employees, customers, and communities. Oil and gas companies operating in Nigeria face increasing pressure to address environmental concerns and demonstrate their commitment to sustainability. Stakeholder Theory suggests that these firms should actively engage with their stakeholders and take into account their interests and expectations, including disclosing relevant environmental information. By disclosing environmental information, oil and gas companies can address stakeholder concerns and build trust (Aliyu, et al., 2022). Stakeholders such as investors and consumers are increasingly interested in the environmental impact of the companies they invest in or purchase products from. By providing transparent information regarding their environmental performance and practices, oil and gas firms can demonstrate their commitment to responsible operations, which can enhance stakeholder trust and positively impact market value.

Afolayan and Adegbemi (2019) in their study found that environmental information disclosure positively influences the market value of oil and gas firms in Nigeria. The results showed that companies that disclosed more environmental information experienced higher market value. Additionally, the Nigerian Stock Exchange (NSE) implemented the Sustainability Disclosure Guidelines in 2015, which encourage listed companies to disclose relevant environmental information, among other sustainability aspects. This guideline aligns with the principles of Stakeholder Theory, as it recognizes the importance of considering stakeholder interests and expectations, including environmental concerns. Overall, Stakeholder Theory provides a framework for understanding the relationship between environmental information disclosure and the market value of listed oil and gas firms in Nigeria. By actively engaging with stakeholders and addressing their concerns through transparent disclosure, companies can build trust, enhance their reputation, and potentially increase market value.

Empirical Review

A review of extant literature reveal that there have been several empirical studies regarding the relationship between environmental remediation costs on the in the behaviour of investors in the listed oil and gas firms in Nigeria.

Ogbulafor et al (2025) investigated the effect of environmental cost disclosure particularly waste management costs, on the financial performance of listed manufacturing firms in Nigeria. The study adopted ex post facto research design with data extracted from annual financial statements and sustainability reports of 12 purposively selected firms across six manufacturing sectors for the period 2015 to 2024. The data were analysed with

descriptive and inferential statistics including correlation and panel generalized method of moments regression. The findings revealed that correlation analysis waste management cost had statistically significant positive relationship with return on equity; while regression results showed that waste management cost had a significant positive effect on return on equity and return on asset.

Emenyi et al (2025) examined the relationship between environmental accounting disclosure and cost of capital of listed consumer goods companies in Nigeria. The population of the study comprised of listed consumer goods firms in Nigeria. The study adopted ex post facto research design as data were extracted from the annual reports and accounts of 18 listed consumer goods firms in Nigeria from 2014 to 2023. The data collected were analysed using descriptive statistics and panel multiple regression with the aid of E-views. The findings of the study revealed that environmental accounting risk disclosure and waste management disclosure have significant negative relationship with cost of equity of listed consumer goods firms in Nigeria; while greenhouse gas emission has non-significant relationship with cost of equity; health and safety disclosure has significant relationship with cost of equity of consumer goods firm in Nigeria. The study concluded that environmental accounting disclosure significantly influences cost of equity of listed consumer goods firms in Nigeria.

Kornom-Gbaraba, et al (2025) conducted a study on the impact of community development cost disclosure on the corporate financial performance of quoted oil and gas companies in Nigeria. The study period covers five years from 2018 to 2022. The study adopted ex-post facto research design as secondary data sourced from Nigeria Exchange Group were employed. A sample of seven companies quoted on the stock exchange during the period were used. The data collected analysed using ordinary least square method and E-views version 2.0. The results revealed that community development cost disclosure have positive but insignificant relationship with financial performance.

Adepoju and Adeagbo (2025) investigated the effect of environmental disclosure on financial performance of manufacturing companies in Nigeria. The study adopted ex post facto research design as data for the study were obtained from the annual reports of manufacturing companies for the years 2017 to 2023. The data were analysed using multiple regression technique. The findings of the study revealed that environmental disclosure has a positive significant effect on firm performance.

Oshiole (2024) examined the effect of community development cost and pollution control disclosure on market value of listed consumer and industrial goods firms in Nigeria covering a period of ten years from 2014 to 2023. The study adopted ex post facto research design while longitudinal panel design was used to analyze the data. The results of analysis revealed that community development cost and pollution control disclosure has a negative and insignificant effect on Tobin Q which was used to proxy market value of listed consumer and industrial goods firms in Nigeria.

Okpo, et al (2024) conducted a study on the influence of sustainability performance on investors' behaviour in the capital market. The independent variable of the study being sustainability performance was proxied by environmental, social and governance disclosures; while the dependent variable being investors' behaviour was proxied by market

capitalisation. The population of the study comprised of nine listed oil and gas firms listed on the floor of Nigerian Exchange Group. The study adopted ex post facto research design as data were extracted from the annual reports and accounts of the selected firms for the years 2015 to 2022. The data were analysed with descriptive statistics and regression models with the aid of SPSS version 20. The findings of the study revealed that environmental, social and governance disclosure exhibited positive and significant relationship with market capitalisation, indicating that sustainability performance influences behaviour of investors in the capital market positively.

Eniefiok et al. (2024) examined the relationship between environmental voluntary disclosure and the market value of listed consumer goods firms in Nigeria. The researchers adopted an ex-post facto research design and collected panel data covering ten years (2013-2023) from eighteen listed consumer goods firms in Nigeria. They analyzed the data using descriptive statistics and panel multiple regression analysis with the E-views 10.0 statistical package. The findings indicated that carbon emissions disclosure, renewable energy consumption disclosure, and employee health and safety disclosure each had a significant positive relationship with market capitalization. Additionally, community development disclosure also showed a significant positive relationship with market capitalization. However, waste management disclosure demonstrated an insignificant positive relationship with market capitalization.

Opuni-Frimpong et al (2024) examined the impact of environmental disclosure on the corporate financial performance of listed companies in Ghana before and during the banking crisis and the Covid-19 pandemic. The study used data from 16 companies listed on the Ghana Stock Exchange between 2012 and 2021. The environmental disclosure index was used, which uses percentile ranking and guided by global Reporting Initiative guidelines. The findings confirmed that environmental disclosure has positive significant effect on corporate financial performance measures, return on equity and earnings per share before and during the crises.

Okpo, et al (2024) conducted a study on the effect of environmental policy disclosure on confidence of investors in the Nigerian capital market. The environmental policy disclosure was proxied by environmental replenishment policy disclosure, waste management policy disclosure and carbon emission management policy disclosure while the dependent variable which was investor's confidence was proxied by market capitalisation. The study adopted ex-post facto research design as data from the study were extracted from annual reports of companies listed on the floor of Nigeria Exchange Group from 2016 to 2022 using content analysis. The data were analyzed using descriptive statistics and multiple regression. The results of analysis indicate that environmental replenishment policy disclosure, waste management policy disclosure and carbon emission management policy disclosure exhibited significant positive relationship with market capitalisation. The study concludes that disclosure of information on environmental policy enhances investors' confidence in the capital market.

Akpan et al. (2024) examined the effect of environmental disclosure on the cost of equity of listed consumer goods firms in Nigeria. Ex-post facto research design was adopted,

and panel data covering ten (10) years (2013-2022) were collected across eighteen (18) listed consumer goods firms in Nigeria which formed the sample size of the study. The data collected were analysed using panel multiple regression analysis via E-views 10.0 statistical package. The study findings revealed environmental risk disclosure and waste management disclosure have significant negative relationships on cost of equity (COE) of listed consumer goods firms in Nigeria while greenhouse gas emission disclosure (GGED) has an insignificant negative effect on cost of equity (COE) of listed consumer goods firms in Nigeria.

Agweda et al (2024) studied the effect of environmental disclosure on market value of added of listed industrial goods firms in Nigeria. Emission disclosure, pollution disclosure, control environment disclosure, compliance disclosure, and environmental grievance mechanisms disclosure were used as proxies while market value added was the dependent variable. The study adopted ex post facto research design as data were extracted from the financial statements of the twelve listed industrial goods firms from 2012 to 2023. The data were analysed with inferential statistics using Pearson correlation and Panel Least Square regression analysis using E-views version 10.0. The findings revealed that a relationship exists between environmental disclosure and market value added of listed industrial good firms. The study concluded that the components of environmental disclosure are important variables in explaining market value added of listed industrial good firms in Nigeria.

Aguguom (2024) examined the impact of environmental conservation expenditures on the financial stability of listed industrial businesses in Nigeria. The study employed ex post facto research design using secondary data obtained from financial statements of 15 selected firms, purposely selected from a pool of 66 registered manufacturing companies in Nigeria over 16 years period of 2008 to 2023. The data were analysed with pooled ordinary least squares regression cluster model, with the authenticity and reliability of the data supported by statutory auditor's certification. The findings of the analysis indicates a significant and positive influence of the environment on the sustainability practices of listed manufacturing enterprises in Nigeria.

Emenyi and Okpokpo (2023) investigated the relationship between environmental disclosure and the quality of financial reports within the Nigerian manufacturing sector. The study reported that, among the three components of environmental accounting information examined, namely environmental restoration (ER) and environmental donations and sponsorship (EDS), only Environmental Waste Management was found to have a significant impact on the quality of financial reports among the selected manufacturing firms in Nigeria. The null hypotheses for environmental restoration and environmental donations and sponsorship were reported as accepted, signifying that these factors did not exert a significant influence on financial report quality.

Wu and Li (2023) investigated the relationship between environmental disclosure and financial performance as well as the mediating effect of provincial characteristics. The study focused on heavily polluting enterprises in China from 2008 to 2019. The findings of the study show a positive relationship between both mandatory environmental disclosure and voluntary environmental disclosure and financial performance, but it weakens the

relationship between environmental disclosure and financial performance and financial performance.

Friske et al. (2023) examined the relationship between voluntary sustainability reporting and firm value, as measured by Tobin's Q. The research design adopted for the study was longitudinal and secondary data were used. These secondary data were obtained from the studied firm's annual report and the stock exchange fact books. Three main hypotheses, developed from signalling theory and sustainability reporting literature, were tested on a large panel of reporting and non-reporting organizations for the period 2011–2020. The results of a fixed effects panel model suggested that, in general, sustainability reporting was negatively related to Tobin's Q.

Udomah and Emenyi (2023) delved into the impact of sustainability reporting on the financial performance of selected cement firms in Nigeria, employing an ex-post facto research design with a population comprising 10 cement firms spanning the years 2016-2020. The key findings indicated a negative and insignificant correlation between environmental reporting and the performance of cement companies in Nigeria. Conversely, economic reporting demonstrated a positive influence on the financial performance of these cement firms, while social reporting was associated with a decrease in their financial performance.

Oyerogba et al (2023) investigated the link between environmental accounting disclosure and financial performance of listed material companies in Nigeria. The study used total enumeration sampling technique with data drawn from 12 companies listed under basic material on the Nigerian Stock Exchange for ten years from 2010 to 2019. The data were analysed using descriptive and inferential statistics. The results revealed that there is relatively low disclosure of environmental accounting information in the financial statement of listed basic material companies in Nigeria. The regression results shows that about 62% of the variable in the dependent variable (ROCE) was explained by the combined effect of environmental accounting disclosure. The study concludes that environmental accounting disclosure has significant impact on financial performance of listed basic materials companies in Nigeria.

Fizzah et al., (2023) empirically examined the impact of environmental disclosure on financial performance using green innovation as a mediating factor. This study used a sample dataset comprising Chinese firms listed on Shanghai and Shenzhen stock exchange for the period of 2005–2016. Empirical results showed that environmental disclosure affects firm financial performance directly and positively influences it through green innovation in Chinese firms. The study suggested that Chinese firms have implications for improved performance by increasing environmental disclosure and green practices.

Okere et al., (2022) examined the effects of environmental accounting costs on the financial performance of selected quoted oil and gas firms in Nigeria. The utilized secondary data generated from annual reports of three oil and gas firms covering a period of 21 years from 2000 to 2020. The study adopted both descriptive and inferential statistics in analysing the panel data and in order to empirically investigate the effect of explanatory variables on the dependent variables, multiple regression model involving ordinary least squares method was used to test the hypothesis formulated. Results from the regression indicate environmental

internal failure cost have a positive and significant effect on the financial performance of oil and gas companies in Nigeria, while environmental pollution prevention costs and environmental detection costs revealed an insignificant effect on the financial performance of oil and gas companies in Nigeria.

Haixia and Jianping (2022), studied the relationship between environmental disclosure and financial performance focusing on the heavy polluting enterprises in China from 2008 to 2019. Findings show that there is positive relationship between both mandatory environmental disclosure and voluntary environmental disclosure and financial performance; economic development positively relates to corporate financial performance, and it also strengthens the relationship between environmental disclosure and financial performance; information penetration positively relates to corporate financial performance, but it weakens the relationship between environmental disclosure and financial performance.

Nangih et al (2022) examined the effect of environmental disclosures on earnings quality of listed consumer goods companies in Nigeria. The study used management efficiency as a moderating variable on the relationship between environmental disclosures and earnings quality. The study adopted the ex post facto research design, and was anchored on the legitimacy theory. Convenience sampling technique was used to determine a sample of six selected consumer goods firms listed on the Nigerian stock exchange. Data collected from published financial statements of sampled firms, for seven years (2014 to 2020) were analyzed using descriptive, correlation and Panel least square regression technique. The findings revealed that environmental sustainability disclosures had positive and significant influence on the earnings quality of consumer goods firms in Nigeria.

Methodology

The study adopted ex post facto research design with data collected from published annual reports of the nine selected oil and gas firms listed on the floor of Nigerian Exchange Group for the period of ten years (2014 to 2025).

Hypothesis formulation

Five hypotheses were postulated for this study.

H_{01}: Waste management cost disclosure has no significant effect on the behaviour of investors in the listed oil and gas firms in Nigeria.

H_{02}: Environmental cleanup cost disclosure does not significantly affect the behaviour of investors in the listed oil and gas firms in Nigeria.

H_{03}: Employee safety cost disclosure has no significant effect on the behaviour of investors in the listed oil and gas firms in Nigeria.

H_{04}: Community development costs disclosure does not have any significant effect on investor's behaviour in the listed oil and gas firms in Nigeria.

H_{05}: Behaviour of investors not significantly affected by pollution control cost disclosure in

the oil and gas firms listed in the Nigerian capital market..

Model development

The interrelationships of the dependent and independent variables were expressed in the functional models. The specification of our model was based on the financial econometrics variables adopted from the previous work of Okpo et al (2023), Emenyi and Udomah (2023). The functional model of the relationship between independent variable which is the environmental restoration cost disclosure (ERCD) and dependent variables which is the market capitalisation (MCAP) is presented below:

MCAP = f (ERCD) ---------- (i)

Where: MCAP = Market capitalisation

ERCD = Environmental restoration costs disclosure.

The second model expresses the relationship amongst the variables used to measure the independent variable which is environmental remediation costs disclosure as follows:

ENCD = *f*(WMCD, ECCD, ESCD,CDCD, PCCD) ---------- (ii)

Where:

$ENCD_t$ = Environmental remediation costs disclosure in period t

$WMCD_t$ = Waste m anagement cost disclosure in period t

$ECCD_t$ = Environmental cleanup cost disclosure in period t

$ESCD_t$ = Environmental safety cost disclosure in period t

CDCD = Community development cost disclosure in period t.

PCCD = Pollution control cost disclosure in period t.

The relationship between the dependent variable which is market capitalisation and the sub variables of the independent variables is expressed in the econometric model as follows:

$$\mathbf{MCAP_t = \beta_o + \beta_1 WMCD_t + \beta_2 ECCD_t + \beta_3 ESCD_t + \beta_4 CDCD_t + \beta_5 PCCD_t \mu_t}\text{----Eq. (iii)}$$

Where: β_o, β_1, β_2, β_3 β_4 and β_5 are coefficients which will be determined from the results of data analysis and μt is the error term included to measure those variables not captured in the model which affect market capitalisation.

Data Analysis

The data for the study were analysed with the aid of E-views software using various statistical techniques which included descriptive statistics, regression assumption tests and panel multiple regression analysis.

Descriptive statistics

This was conducted to understand the behaviour of the data using various statistics including mean, standard deviation, skewness, and kurtosis. The result for the descriptive statistics analysis is as presented below:

Descriptive statistics of variables

	MCAP	WMCD	ECCD	ESCD	CDCD	PCCD
Mean	1.537333	0.655556	0.577778	0.522222	0.61112	0.4882
Median	1.325000	1.000000	1.000000	1.000000	0.38666	0.5411
Maximum	3.410000	1.000000	1.000000	1.000000	1.0000	1.000
Minimum	0.010000	0.000000	0.000000	0.000000	0.0000	0.0000
Std. Dev.	0.830202	0.477849	0.496681	0.502304	0.42336	0.22245
Skewness	0.441587	-0.654713	-0.314945	-0.088977	0.3325	0.3481
Kurtosis	2.380854	1.428650	1.099190	1.007917	1.00010	1.0000
Jarque-Bera	4.362524	15.68903	15.03690	15.00024	15.03690	15.0043
Probability	0.112899	0.000392	0.000543	0.000553	0.00182	0.00114
Sum	138.3600	59.00000	52.00000	47.00000	50,0000	44.0000
Sum Sq. Dev.	61.34196	20.32222	21.95556	22.45556	12.0441	11.03872
Observations	90	90	90	90	90	90

Source: Researcher's computation using E-views 10.0 (2025)

Model evaluation

Residual and coefficient diagnostics were however conducted to assess the suitability of the model as stated in the previous section. These include normality test, multicollinearity test and heteroscedasticity test.

Normality test

The Jarque-Bera test was employed in this case. As applied, if the p-value associated with the Jarque-Bera test is below a predetermined significance level ($p<0.05$), then we reject the null hypothesis and conclude that the data do not follow a normal distribution. With a p-value of 0.058501, there is sufficient evidence to conclude that the data were normally distributed.

Multicollinearity test

Variance inflation factors (VIF)

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.023578	4.222948	NA
GHGED	0.025533	2.997949	1.032627
NATOD	0.025533	2.642260	1.115621
EFPD	0.025048	2.342878	1.119375
CDCD	0.12241	2.432226	1.091113
PCCD	0.02133	2.000121	1.110000

Source: Researcher's computation using E-views 10.0 (2025)

The VIF measures the extent to which the variance of the estimated regression coefficients is increased due to multicollinearity. A high VIF indicates a strong correlation between the predictor variables, suggesting severe multicollinearity issues. VIF value of less than 10.0 signifies that no severe multicollinearity exists in the model. With a centered variance inflation factor value of 1.03, 1.11 and 1.11, there is sufficient evidence to conclude that the explanatory variables in the regression model are free from multicollinearity issues.

Heteroscedasticity test

Cross-section dependence/ Heteroscedasticity test

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	55.79719	36	0.0687
Pesaran scaled LM	1.272461		0.2032
Pesaran CD	-1.024182		0.3057

Source: Researcher's computation using E-views 10.0 (2025)

The statistics and probability value associated with the Breusch-Pagan LM test otherwise known as the Breusch-Pagan Godfrey test help determine whether there is evidence of heteroscedasticity in the regression model. A low p-value ($p<0.05$) suggests evidence against the null hypothesis in favour of the alternate hypothesis which indicates the presence of heteroscedasticity in the regression model. With a p-value of 0.0687, there is sufficient evidence to accept the null hypothesis, thus, conclude that the predictor variables in the regression model were homoscedastic.

Regression analysis

The results of the panel multiple regression analysis are stated in table 4.5 below.

Panel multiple regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.736435	0.153551	4.796043	0.0000
WMCD	0.591113	0.159791	3.699302	0.0004
ECCD	0.501969	0.159791	3.141422	0.0023
ESCD	0.236228	0.158267	1.492592	0.1392
CDCD	1.020211	0.022221	1.222342	0.1340
PCCD	0.420211	0.122321	1.522340	0.0940
R-squared	0.295517	Mean dependent var		1.537333
Adjusted R-squared	0.270942	S.D. dependent var		0.830202

S.E. of regression	0.708867	Akaike info criterion	2.193130
Sum squared resid	43.21438	Schwarz criterion	2.304232
Log likelihood	-94.69083	Hannan-Quinn criter.	2.237933
F-statistic	12.02511	Durbin-Watson stat	2.464991
Prob(F-statistic)	0.000001		

Source: Researcher's computation using E-views 10.0 (2025)

From the regression results in the table above, when the independent variables- waste management costs disclosure (WMCD), environmental clean-up costs disclosure (ECCD), employee safety costs disclosure (ESCD) and community development cost disclosure (CDCD) are held constant (equal Zero), the dependent variable– market capitalization (MCAP) increased at a constant average of approximately 0.74. However, a unit rate of waste management costs disclosure (WMCD), environmental clean-up costs disclosure (ECCD), employee safety costs disclosure (ESCD) and community development cost disclosure (CDCD) stood at 0.59, 0.50, 0.24, 1.02 and 0.42 respectively.

Test of hypotheses

Each of the hypotheses in this study was tested based on the result obtained from the panel multiple regression analysis. The result that relate to these hypotheses is summarized in table above.

Hypothesis one

The hypothesis one for this study was stated in a null form as follows:

H_0: Waste management cost disclosure has no significant effect on the behaviour of investors in the listed oil and gas firms in Nigeria.

From the results of analysis the t-cal stood at 3.6993 at .05 significance level with t-tab value of 2.306 given at $_{T0.05,9}$. Since the t-cal. is greater than t-tab the null hypothesis which states there is no significant relationship between waste management cost disclosure and market capitalization (MCAP) of listed oil and gas firms in Nigeria fails to hold, thus rejected. The rejection of the null hypothesis is further confirmed given that at tc of 0.059, its probability value (p-value = 0.0004) is less than 0.05.

Hypothesis two

The null hypothesis two of this study was stated as follows:

H_0: Environmental clean-up cost disclosure does not significantly affect the behaviour of investors in the listed oil and gas firms in Nigeria.

The result of the t-test carried out at .05 significance level stood at t-cal of 3.1414 with the t-tab value of 2.306.Since the t-cal of 3.1414 is greater than t-tab value of 2.306 given at $_{T0.05,9}$,

the null hypothesis which states there is no significant relationship between environmental clean-up cost disclosure and market capitalization (MCAP) of listed oil and gas firms in Nigeria fails to hold, thus rejected. The null hypothesis is further rejected given that at $T_{0.05,9}$, its probability value (p-value = 0.0023) is less than 0.05.

Hypothesis three

The null hypothesis three of this study was stated as follows:

H_0: Employee safety cost disclosure has no significant effect on the behaviour of investors in the listed oil and gas firms in Nigeria.

From the result of analysis in the table above, the test was carried out at .05 significance level with t-cal of 1.4925 with t-tab of 2.306. Since the t-cal of 1.4925 was less than t-tab given at tc-2.306 the null hypothesis which states there is no significant relationship between employee safety cost disclosure (ESCD) and market capitalization (MCAP) of listed oil and gas firms in Nigeria holds, thus accepted. The null hypothesis is further accepted given that the probability value (p-value = 0.1392) was greater than 0.05.

Hypothesis four

The null hypothesis four of this study was stated follows:

H_{04}: Community developments cost disclosure has no significant effect on the behaviour of investors in the listed oil and gas firms in Nigeria.

From the result above, the t-cal stood at 1.222 is less than t-tab of 2.306 at 0.05 level of significance. Hence, the null hypothesis which states there is no significant relationship between community relations cost disclosure (CDCD) and market capitalization (MCAP) of listed oil and gas firms in Nigeria holds, thus accepted. The null hypothesis is further accepted given that its probability value (p-value = 0.1392) is greater than 0.05.

Hypothesis five

The hypothesis five of this study was stated in a null form as follows:

H_0: Pollution control cost disclosure has no significant effect on the behaviour of investors in the listed oil and gas firms in Nigeria.

From the result above, the T-cal of 1.52125 is less than t-tab given at tc-0.05,9. Hence, the null hypothesis which states there is no significant relationship between employee safety cost disclosure (ESCD) and market capitalization (MCAP) of listed oil and gas firms in Nigeria holds, thus accepted, and the alternative hypothesis rejected. The null hypothesis is further accepted given that at $T_{0.05,9}$, its probability value (p-value = 0.0940) is greater than 0.05.

Discussion of findings

The coefficients of the results of analysis of data were extracted and fitted into the multiple regression model earlier formulated as below:

$$\mathbf{MCAP = 0.736435 + 0.591WMCD + 0.501ECCD + 0.236ESCD + 1.020CDCD + 1.420PCCD + \mu.}$$

From the results of regression analysis in table 4.5 above, the coefficient of determination of the relationship between environmental cost disclosure and market capitalisation stood at 0.296 indicating that 29.6 percent of changes in market capitalisation is accounted for by changes in environmental cost disclosure; while 70.0 percent is accounted for by other factors outside environmental cost disclosure.

The discussions of specific hypothesis are made hereunder.

Waste management costs disclosure and market capitalization

The study findings documented that waste management costs disclosure (WMCD) has a significant positive relationship with market capitalization (MCAP) of listed oil and gas firms in Nigeria. The coefficient of 0.5911 indicates that for every unit increase in waste management costs disclosure, the market capitalization of listed oil and gas firms in Nigeria is expected to increase by 0.5911. The findings suggest that investors view such disclosures as an indicator of a firm's commitment to environmental sustainability and social responsibility, which can lead to increased trust and confidence in the firm, positively affecting its market value. Furthermore, with the increasing awareness and concern about climate change, environmental sustainability has become an essential consideration for investors in making investment decisions. Hence, firms that are proactive in disclosing their greenhouse gas emissions are perceived as more sustainable and likely to perform better in the long run. This position however aligns with majority of extant studies. These studies include Aliyu, et al., (2022), Yayaya (2018), Oti and Ogar (2018), Mohan et al., (2019), Emmanuel, et al., (2019), Ezeagba, et al., (2017), Ahmed, et al., (2016) alongside Ofregbu and Aminoritse (2016)

Environmental cleanup costs disclosure and market capitalization

Environmental clean-up costs disclosure (ECCD) has a significant positive relationship with market capitalization (MCAP) of listed oil and gas firms in Nigeria. With a coefficient of 0.5019, a unit increase in environmental clean-up costs disclosure is associated with a 0.5019 increase in market capitalization. The findings imply that firms that disclose information about environmental clean-up costs, such as oil spills, pipeline leaks, and other related incidents, tend to have higher market value as investors perceive them as being more transparent and accountable. Effective disclosure of environmental cleanup costs also indicates that a firm has robust risk management practices and is taking proactive measures to minimize the negative environmental impacts of its operations. This is in line with the findings of Oraka and Egbumike (2016). Oraka and Egbumike (2016) found out that environmental disclosures, natural occurrence disclosure has significant effect on total assets turnover and returns on equity, and no significant effect was found for cash flow ratio and current ratio of manufacturing companies in Nigeria.

Employee safety costs disclosure and market capitalization

The study also revealed that employee and safety costs disclosure (ESCD) has an insignificant positive relationship with market capitalization (MCAP) of listed oil and gas firms in Nigeria. The coefficient of 0.2362 suggests that a unit increase in environmental

fines and penalties disclosure leads to a 0.2362 increase in market capitalization. However, since the relationship is statistically insignificant (p-value of 0.1392), it implies that such disclosures may not have a significant impact on the market value of listed oil and gas firms in Nigeria. The findings suggest that investors may not view the disclosure of employee safety costs as relevant indicators of the firm's sustainability or operational efficiency.

Community development costs disclosure and market capitalization

The study findings documented that community development costs disclosure (CDCD) has a significant positive relationship with market capitalization (MCAP) of listed oil and gas firms in Nigeria. The coefficient of 1.0202 indicates that for every unit increase in waste management costs disclosure, the market capitalization of listed oil and gas firms in Nigeria is expected to increase by 1.0202. The findings suggest that investors view such disclosures as an indicator of a firm's commitment to environmental sustainability and social responsibility, which can lead to increased trust and confidence in the firm, positively affecting its market value. Hence, firms that are proactive in disclosing their community development initiatives are perceived as more sustainable and likely to perform better in the long run. This position however aligns with majority of extant studies by Kornom-Agbaraba et al (2025) and Yusuf and Dandago (2023) who found a positive relationship between community development cost disclosure and financial performance of oil and gas firms.

Pollution control cost disclosure and market capitalisation

The findings of the study revealed that pollution control costs disclosure (PCCD) does not have any significant relationship with market capitalization (MCAP) of listed oil and gas firms in Nigeria. The coefficient of 0.4202 indicates that for every unit increase in pollution control costs disclosure, the market capitalization of listed oil and gas firms in Nigeria is expected to increase by 0.4202. The findings suggest that investors view such disclosures as an indicator of a firm's commitment to environmental sustainability and social responsibility, which can lead to increased trust and confidence in the firm, positively affecting its market value. Hence, firms that are proactive in disclosing their greenhouse gas emissions are perceived as more sustainable and likely to perform better in the long run. This position however aligns with majority of extant studies such as Aliyu, et al., (2022), Yayaya (2018), Oti and Ogar (2018), Mohan et al., (2019), Emmanuel, et al., (2019), Ezeagba, et al., (2017), Ahmed, et al., (2016) alongside Ofregbu and Aminoritse (2016).

Conclusion and recommendations

The findings of this study show that environmental remediation cost disclosure plays a significant role in determining the behaviour of investors in the listed oil and gas firms in Nigeria. Thus the study concludes that disclosure of information on environmental remediation cost influences the behaviour of investors in the oil and gas firms in Nigeria.

Arising from the findings and conclusion of this study, the following recommendations were proffered:

1. Companies should invest in environmental management practices to maintain environmental standards and comply with regulations.

2. Companies should also invest in environmental cleanup efforts to avoid negative impacts on profitability.
3. Regulatory authorities should continue to enforce environmental regulations to ensure that companies are held accountable for their environmental impacts.
4. Oil and gas firms should increase the tempo of community relations in the communities they operate by engaging all relevant stakeholders including the youth.
5. Oil and gas firms should develop a policy of contributing to setting aside a part of the earnings for the purpose of controlling pollution.

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