***ISSN: 4792 -61X2***
***Volume 12, Number 1, 2025***
***Innovative Journal of Marketing, Management and Accounting Research***

# ECOLOGICAL COST ACCOUNTING AND FINANCIAL PERFORMANCE OF LISTED OIL AND GAS FIRM IN NIGERIA.

**Dr. (Mrs.) Patience C. Omah**
**Department of Accounting, Ignatius Ajuru University of Education**

*Mail: omahpatiencec@gmail.com*

***ABSTRACT***

*This study examined the relationship between ecological cost accounting and the financial performance of listed oil and gas firms in Nigeria. For oil and gas corporations in Nigeria, the specific goals were to ascertain the relationship between community development expenses and environmental remediation costs. Data was gathered from audited accounts issued on the Nigerian Exchange Group (NEG) of 2014 to 2024 using an ex post facts research design. The nine (9) oil and gas firms that were randomly listed on the Nigerian Exchange Group as 31st December, 2024 to make up the study's population. The results demonstrate that ecological compensation costs (ECC) and waste management costs (WMC) had no appreciable influence on the firms' return on assets and earnings per share. Therefore, the research study therefore recommend that oil and gas Firms should engage in more research and development activities in order to discover new ways of reducing environmental cost in order to enhance their financial performance.*

***Keywords: Ecologial cost accounting, financial management,***

## Background to the Study

Ecological accounting is a vital tool to assist in the management of Ecological and operational costs of natural resources. Valuation of natural resources is an essential input into both social cost-benefit analysis and some approaches to Ecological accounting. Eco-friendly accounting, also called Ecological accounting, refers to modification of the System of National Accounts to incorporate the use or depletion of natural resources. The increasing concern about Ecological degradation, resources depletion and the sustainability of economic activity have made the development of Ecological accounting and reporting an area of significant. In the topical times there have been an increased awareness of the interaction between firms and Ecosystem in which they operate, this enlightenment has been sharpened by concerns about resources depletion, resources scarcity, Ecological degradation and the activities of these firms that lead to the depletion of the ozone layer and thereby causing an imbalance in the Ecological system (Adedran & Alade, 2013).

Eco-friendly accounting is a type of accounting that attempts to include factor Ecological costs into the financial results of operations. It has been argued that gross domestic product ignores the Ecosystem and therefore policymakers need a revised model that incorporates Eco-friendly accounting (Smulders, 2008). Ecological costs include costs of complying with Ecological laws, Ecological remediation costs, pollution control equipment costs and non-compliance penalty. Based on the meaning of Ecological degradation, Ecological cost could also cover the cost incurred to prevent degradation, cost of re-stating the Ecosystem to its original state, cost of restoring depleted Ecosystem to its normal position (Okafor, 2018). Profit ascertainment requires the subtraction of recurrent costs from revenues. Most often, the costs that leads to changes in the Ecosystem, which affect people adversely and cause damages to the Ecosystem are not taken into consideration before profits are determined. In other words, the profits could be wrongly determined. The result of this, in most cases, is accounting of wrong and excessive profits which will also mislead the decision makers.

Over the years, businesses that partners in the development and contributions of negative Ecological impacts are expected to play lead role in instituting measures to mitigate their Ecological impacts and achieve global reduction in negativities of their actions (Oliff & Vandermerve, 2017) Peavler (2017) Gatimbu and Wabwire (2016) observed that businesses engaging in Ecological management result in "win-win" situation and have better financial performance. Despite the above observations some researchers such as Hossain, Islam and Andrew (2016) Agyapong and Nuertey (2017) strongly kicked against spending on the Ecosystem stating that businesses' expenditure on the Ecosystem affect businesses bottom line. Friedman (1970) claimed that Ecological expenditure is a diversion of funds from positive projects. Thereby depriving shareholders of value for money, may increase price of customers and reduce employee wages. In the light of the above contentions, empirical investigation of the effect of Ecological costs on financial performance of oil and gas firms listed on the Nigeria Stock Exchange becomes inevitable hence this research work is carried out.

Most organizations into the exploration and production of economic goods and services are facing anxiety and the purpose of economic activity is wealth creation. Petroleum production and export play a dominant role in Nigeria's economy and account almost 90% of her Gross earnings. In 2010, Baird accounting that between 9 million and 13 million barrels have been spilled in the Niger Delta since 1985. Since the discovery of petroleum in the Niger Delta region of Nigeria by the British in 1956 and its commercialization in 1958, oil Firms engage in petroleum exploration, production, distribution and . Oil exploration and production activities also generate waste and this waste not properly managed has led to Ecological pollution and degradation (Owalabi, 2006). However, the process of extraction and production of petroleum there is a great deal of potential to cause several and available Ecological harm by unchecked oil and gas exploration activities, in addition to severe health hazards that is usually associated with oil and gas exploration activities resulting from pollution and the likes.

Considering this awareness, innumerable laws and regulations such as the Ecological Impact Cost Act, 1992 and the Department of Petroleum Resources (DPR), Ecological Guidelines and Standards for the Petroleum Industry in Nigeria were enacted. These requires corporate managements to consider the Ecological implications of all internal decisions. Also, all organizations monitored by Ecological policy agencies in Nigeria are expected to demonstrate much consideration in decision making, (Enahoro, 2021). In recent years, oil and gas Firms are becoming progressively more aware of the Ecological and social liabilities pertaining to their operations and products. In addition to social pressure, accounting especially ecological costs are critically important to form this Ecological awareness. In the 1960s, Ecological Cost Accounting has gained increasing implication.

Organizations now include the Ecological costs of their activities in their financial statements to reveal to stakeholders that they are ethically responsible and Ecosystem friendly. Ecological Cost Accounting is taken to mean the identification and Accounting of Ecosystem specific costs, such as liability costs or waste disposal costs, to enable management to control costs and also aid in decision making. Graff, et al (2018), opines that Ecological Cost Accounting refers to the incorporation of Ecological costs and information into variety of accounting practices. In other words, Ecological Cost Accounting forms that part of accounting that deals with Ecosystem concerns. Presently, firms are now being Cost not only with their financial indications but also their Ecosystems are Cost (Macver, 2017).

In future, there will be an overriding responsibility of every company to make use of its human and material resources to the fullest. Ecological pollution and degradation have become a serious threat to survival of human life and the Ecosystem and it's against this background that a number of Firms and other organizations are solidifying their Ecological approach and developing business activities that takes the Ecosystem into consideration by means of Ecological Cost Accounting. The research

seeks to understand the logic behind the practice of Ecological Cost Accounting by Oil and Gas Firms and whether or not it has any relationship with financial performance of oil and gas Firms in Nigeria.

The study research gap, Most of the aforementioned studies conducted on Ecological Cost Accounting and financial performance in the oil and gas firms and other sectors have been centered on net profit margin, return on capital employed, return on total assets, dividend per share as proxies of financial performance alongside employee welfare and social benefits, employee's health and safety, donations and charitable contributions, community development cost and waste management like in the study of Yusuf (2011), who examined Ecological responsibility and performance of listed oil and gas Firms in Nigeria; Gray *et al.* (2017), investigated the impact of Ecological cost on corporate performance; Makori and Jagongo (201 3),who examined Ecological Cost Accounting and firm profitability. Compensation cost and waste management cost as independent variable has not been studied along with total assets and earnings per share as proxies of financial performance. But this study therefore fills that research gap and provides further examination into Ecological Cost Accounting and financial performance of listed oil and gas firms in Nigeria, choosing different proxies as well as different measures as contained in our conceptual framework of study.

**Statement of the Problem**

In current stretch, It is very sad, that in spite of the great benefit accruing to these oil and gas industries quarterly and annually, most of these petroleum firms, still believe that any expenses incurred on Ecological problems will often result in additional cost to them in the short term, which may also decrease their effectiveness and efficiency in the long term, but, according to Hasan and Hakan (2012) additional cost incurred on Ecological cost, will often lead to significant cost minimization in medium and long term which may even bring about additional income if done properly. Therefore, the problem of this study is to consider why most oil and gas producing firms are still not fully ecological friendly, especially in the communities where they operate, despite the fact that it is possible for this initiative to improve the organization image and also lead to drastic minimization of cost in the medium and long term. Oil and gas firms in Nigeria have been known to cause many Ecological problems in the locations where they operate, majorly because of their ever-increasing strategy, to ensure profit maximization, and adoption of various advanced oil exploration method in their operation.

Adediran and Alade (2013), revealed a negative relationship between Ecological Cost Accounting and financial performance. A study by Gray *et al.* (2013), also revealed a negative relationship as well as a study by Omodero and Ihendiniihu (2016) revealed that Ecological costs is not proportionate to a firm's profit. As a result of this, Ecological Cost Accounting and financial performance has gained substantial interest from academic researchers over the years, both within and outside Nigeria. However, there exist inconsistent and inconclusive argument on the findings of the studies. In recent years, Ecological impact has assumed several dimensions and has become a major economic and social concern. The importance of Ecological Cost Accounting is increasing because of the increased Ecosystem problems, economic, social and technological developments (Hassan & Hakan, 2012). The success or failure of a company may be determined not only by its products or services but also by the complexity of its Ecosystem (Omodero & Ihendinuhu, 2016). Some researchers are of the view that a firm's Ecological costs do not have a significant relationship with the financial performance.

Oil and gas Firms in an effort to protect the Ecosystem against Ecological degradation and pollution incur costs. These costs arise from the activities and products of a firm and could have an adverse impact on the Ecosystem. These costs could be waste management costs, pollution control costs, cost of Ecological laws compliance and penalty, and community development costs.

Yusuf (2024), in his study also revealed a positive relationship between Ecological costs and financial performance. These diverse views have left the researcher in a state of dilemma and has aroused the researcher's interest in investigating the relationship between Ecological Cost Accounting and financial performance of oil and gas firms. On the other hand, the examined Ecological Cost Accounting and firm profitability of 14 randomly selected firms listed in the Bombay Stock Exchange, their findings revealed that there is a significant relationship between between between Ecological cost and financial performance (Makori & Jangogo, 2013). Exploration and production as well as activities of oil and gas Firms have resulted in Ecological degradation and pollution.

Erstwhile studies by Ezeagba et al (2021), observed the relationship between Ecological activity disclosure in Nigeria using return on equity as a measure for food and beverage firms, while Che-Ahmad et al (2025) examined Ecological accounting cost and financial performance of a cross-section of oil and gas firms using 50 firms for sampling. This study therefore, is focused on Ecological Cost Accounting and Financial Performance of Oil and gas firms in Nigeria. Meanwhile, to the best of my facts, there is no recognized work researched in this expanse.

**Aim and Objectives of the Study**

The aim and objective of this study was to ascertain the relationship between Ecological costs on the financial performance of oil and gas firms listed on the Nigeria stock exchange.

**Ecological Cost Accounting**

Giving to the lawdictionary.com, Ecological Reporting (ER) is objective evidence of Ecological conditions as a public disclosure. Its focus is on a firm's Ecological performance information, and it is very much like public statements of financial performance information. Furthermore, it involves both non-financial and financial reporting. Non-financial Reporting on its own as defined by API (2025) is a form of reporting on the range of Ecological, health and safety, social, and economic issues and impacts that relate to oil and gas company operations and products, an d is synonymous with Sustainability Reporting. In addition, firms may choose to use a variety of other terms to refer to this concept, such as corporate responsibility, corporate citizenship, or contributions to sustainable development. The term "non-financial" is used by some firms to distinguish these reports from more traditional company financial reports, even though both reports include economic indicators (API, 2025). In the same vein, there are terminologies that are used interchangeably for reporting in oil and gas industry for global reporting and congruency in accounting. These are according to Campbell and Slack. (2006) as follows: Sustainability or sustainable development reporting, non-financial indicator reporting, corporate responsibility, corporate social responsibility or social responsibility reporting, and Citizenship reporting. All these can be used interchangeably as generic terms to describe voluntary disclosure on performance in these areas. Therefore, depending on the term a company adopts, Ecological and sustainability reporting is necessary as this will at least give a snapshot of the firms" obligations to its host communities as well as Ecosystem. This will in turn enhance its acceptability rating.

**Waste Management Cost**

European Directives 2006/12 and 2008/98 encourage member countries to base their own legislation on control of the entire waste cycle, from production to disposal, applying the so-called "hierarchical principle", which identifies prevention of negative Ecological impacts deriving from waste production as the primary objective, followed, in order of priority, by reuse, recycling, recovery of another type (such as energy production) and, lastly, disposal. It will therefore be attempted to identify whether greater Ecological sustainability can produce positive effects on the economic- financial results of firms operating in said sector. The production and management of waste is a strategic issue for all countries, since it has social, economic and Ecological implications. It would be desirable to combine responsible social behaviour, economic feasibility and Ecological

sustainability, but various parties are involved (citizens, firms, public administrations), often with conflicting needs. This research work deals with Italian firms operating in the collection, treatment and disposal of municipal solid waste (MSW). The aim is to analyze the profitability of these firms and try to understand whether this is related to waste management "best practices", in particular separate collection.

**Compensation Cost**

The issues of compensation cost and financial performance have been major subjects of academic research for some time now. The need for the study of directors' compensation in organizations is linked to the fact that organizational strategy design is the primary responsibility of the executive officers and they take strategic decisions on issues affecting the entire firm. The effect of these decisions on the general outcome of an organization is essential. In the recent years there has been a debate about the level of executive compensation given to executive officers of large corporations. Ferri and Maber (2022) noted that countries like Britain have developed new legislations to control the pays of executive officers and influence it through the voice of the shareholders. Studies have shown further that compensation system play a vital role on how those decisions are made because top management are responsive to what they observed will lead to a personal gravity. (Jegede, 2012; Abdul, *et al.*, 2014; Adeoye, 2015). There is a reason to believe that the effects of these decisions may determine the attainment of organizational objectives. The executive compensation system of organizations cannot be ignored as the mode of rewarding the top management has a key role to play in how business activities are conducted in their respective organizations. The compensation system of executives often differs from that of other members of staff. Top executives are not only more remunerated than the other members of staff, their pay structures also differ. Several investigations have been carried out to examine how executive compensation systems are determined (Ian *et al.*, 2012; Jegede, 2012). Further opinion on this issue showed that current forms of managerial incentive pay do not effectively align with the incentives of managers as several studies indeed cannot show any positive correlation between executive incentive pay and improved performance of the firm.

**Financial Performance (FP)**

Also known as profitability, financial performance is performance measurement by which organizational as well as management ability and efficiency can be measured. According to Dwivedi (2022), there are two kinds of performance, financial performance and non-financial performance; and financial performance emphasizes on variables related directly to financial report. Dwivedi (2022), also established that financial performance is a subjective measure of how well a firm can use assets from its primary mode of business and generate revenues. The term is also used as a general measure of a firm overall financial health over a given period of time and can be used to compare similar firms across the same industry or to compare industries or sectors in aggression (Dwivedi, 2022). Company performance is very essential to management as it is an outcome which has been achieved by an individual or a group of individuals in an organization related to its authority and responsibility in achieving the goal legally and conforming to the morale and ethics. Company's performance is evaluated in three dimensions. The first dimension is company's productivity, or processing inputs into outputs efficiently. The second is profitability dimension, or the level of which company's earnings are bigger than its costs. The third dimension is market premium, or the level of which company's market value is exceeding its book value (Wang, 2022).

**Return on Assets**

Return on Assets is a financial ratio that measures the profitability of a business in relation to its-total assets. It is a financial ratio that indicates how much profit was realized from invested assets. It is calculated by dividing a company's profit after tax by its total assets. Return on Assets is expressed as a percentage. Return on Assets: Profit after tax Total Assets. This is a measure of

performance and it is an important ratio for investment decisions by shareholders. On a general basis, if return on assets is more than the firm borrows for investments in new projects then they could be embarked upon otherwise it is not embarked upon. In addition, ROA provides a standard for assessing how efficiently management employs the average amount which is invested in the firm's assets, whether the amount come from investor or creditors (Al-Hassan, 2014). A low level of return on assets shows that the profits are low for the amount of assets. The return on asset ratio calculates how efficiently profits are being collected from the assets employed. A low return on assets ratio when compared with industry average indicates that there is inefficient utilization of business assets.

**Earnings per share**

Earnings per share is the portion of a company's profit allocated to teach outstanding share of common stock. It is the amount of money each share of stock would receive if all profits were distributed to the outstanding shares at the end of the year. Earnings Per Share: Total earnings/Outstanding shares. Additionally, it is evident from the above literatures, that currently there is no known dedicated accounting standard that exclusively regulate Ecological reporting at the global level and this has led to varying levels of Ecological disclosure among firms who wish to engage in voluntary disclosure thereby creating a whole lot of difficulty in comparing Ecological performance of firms. This situation jeopardizes the interest of investors who may wish to promote firms with high regard for ecologically sustainable programmes. It is the role of the International Accounting Standards Board (IASB) to ensure maximum safety of investors' interest in a firm through provision of standards to guide the preparation financial reports as the managers' representations; so the Board has a great need to deliver on the issue of Ecological accounting, not because efforts are not already on ground by concerned firms but for the sake of uniformity and comparability in financial reports of firms all over the world which also forms the bedrock of the Board's existence.

**Stakeholder's Theory**

In an organization, there are basically two types of stakeholders (Internal and external). Most internal stakeholder includes management, employee and board while external stakeholders include shareholders, communities, creditors, debtors/customers, government agencies, and Ecosystem (Johnson-Rokosu & Olanrewanju, 2023). Basically, stakeholder theory is based on proposition that a firm's success or otherwise depends on a successful management of all the relationships that a firm has with its stakeholders, (Uwuigbe & Jimoh, 2022). It is argued that stakeholder theory is one of the theories that seeks to explain the practice of presenting social information, focused on the role it can play in relations between organizations, governments, individuals, associations and societies in general (Magnaghi & Aprile, 2024). Gray *et al* (2024), reported that from an organizational point of view, stakeholder's theory is based on a model of accountability for all actors, be it normative, descriptive or the explanatory power they hold in the context of CSR; and includes the responsibilities of the company and the transparent nature of its activities. Adediran and Atu (2023) was of the opinion that, the crucial element that the company can use to manage stakeholder relationships is precisely the information (financial, sustainability, or both) managed to gain the support and approval of corporate strategy from the stakeholders, without raising an objection. Voluntary disclosure is amply justified by the stakeholder theory and consequently the theory of legitimacy that is considered an appropriate means to maintain and develop relations between the various interest-bearing groups and the company.

Eilola (2020) Furthermore, enunciated that stakeholder provides another theoretical framework for explaining the relationship between various stakeholders and management; and potentially useful in examining or influencing corporate social disclosures or sustainability reporting by. Organization in the annual corporate reports. Hence, the theoretical framework adopted in this study is the

stakeholders Theory. In line with this, Chamg (2021) gave one of the genuine acknowledgments by industry of a duty to the Ecosystem is one reason for the growth of voluntary Ecological guidelines and policies. Second, these codes are a response to shareholder, customer, interest group and community pressure on firms to be transparent and accountable in Ecological management, allowing industry to demonstrate Ecological responsibility and enhancing public relations. Third, firms have adopted these cooperative and flexible approaches to Ecological regulation in order to avoid prescriptive and costly command and control mechanisms.

Stakeholder theory according to Gatimbu and Wabwire (2023) suggests that a firm will respond to the expectations of stakeholders in the community in which they operate and provide social and Ecological information in their annual Accountings. The main concern of this theory in Ecological Cost Accounting is to address the Ecological cost elements and its inclusion in the financial statement. Freeman (2020) defined stakeholders as any individual or group who has an interest in the firm because he or she can affect or is affected by the activities of the firm. The basic proposition of the stakeholder theory is that the firm's success is dependent upon the successful management of all the relationships that a firm has with its stakeholders (Freeman, 2020).

**Empirical Review**

Bassey *et al.* (2023) in their work whose objective is to examine the impact of Ecological Cost Accounting and Accounting on organizational performance of selected oil and gas marketing Firms in Niger Delta region of Nigeria, found that firms which are Ecologically friendly will significantly publish Ecological related information in their financial statements and other Accountings of the business.

Ifurueze *et al.* (2023) examined the impact of Ecological cost on corporate performance in Nigeria, using a sample of twelve oil Firms quoted on the Nigeria Exchange Group (NEG). Three indicators of ecologically sustainable business practices were used as proxy for Ecological cost, while ROTA was used as proxy for corporate performance. Multiple regression technique was employed to analyze secondary date obtained from the annual Accountings of selected Firms for the eleven years period covering 2001 to 2011. The study found significant relationship between sustainable business practices and corporate perform.

Also, Ifurueze *et al.* (2023) examined the impact of Ecological cost on corporate performance of oil Firms in the Niger Delta States of Nigeria the study revealed that sustainable business practices and corporate performance are 'significantly related.

Malarvizhi and Matta (2016) investigated the Ecological disclosure – firm performance nexus in India based on content analysis of 2013-14 data from the annual Accounting of 85 sampled chemical, energy and metal Firms listed in the Bombay Stock Exchange. Ecological Disclosure Index (ED!) used as dependent variable was regressed against return of capital employed, return on assets, net profit margin, and earnings per share (proxy for firm performance), using simple and multiple correlation techniques. The results revealed no significant relationship between the study variables.

Magara *et al.* (2015) in a study of Ecological Cost Accounting on company financial performance in Kenya examined the impact of Ecological Cost Accounting on financial performance of 16 firms in Kenya. The findings revealed that Ecological Cost Accounting is significantly positively related to financial performance of firms.

Adediran and Alade (2023) investigated if there is any significant relationship Ecological Cost Accounting and corporate performance in Nigeria. The result showed that there is significant negative relationship between Ecological Cost Accounting and return on capital employed and

earnings per share and a significant positive relationship between Ecological Cost Accounting and net profit margin and dividend per share.

Gatimbu and Wabwire (2016) Cost the effect of corporate Ecological disclosure on financial performance of listed firms at the Nairobi Securities Exchange, Kenya. Findings revealed that Ecological disclosure has a positive significant effect cm financial performance.

Okafor (2018) examined the effects of Ecological costs on firm performance. The result of the statistical analysis indicated that Ecological performance positively impacted value of the firms.
Dessy and Suryarningsih (20 15) examined the effect of Ecological performance on financial performance using 17 Firms listed on the Indonesia Stock Exchange. The result showed that Ecological performance has significant effect on ROA and ROE.

Onyinyechi and Ihendinihu (2016) examined the impact of Ecological and corporate social responsibility accounting on organizational financial performance of firms in Nigeria. The result showed no significant impact between variables.

Nor *et al.* (2016) investigated the existence of the Ecological disclosure and financial performance among 100 firms of market capitalization in Malaysia for the year 2011. The analysis showed mixed results between the existence of the Ecological disclosure practices in Malaysia and financial performance.

Rakiv, Islam and Rahrnan (2016) examined the relationship of company profitability and extent of Ecological Cost Accounting disclosure in the annual Accountings. The research disclosed that there is significant positive relation between company profitability and Ecological Cost Accounting index.

Ezejiofor *et al* (2016) Cost the effect of sustainability accounting measure on the performance of corporate organizations in Nigeria. The study found that Ecological cost does not impact positively on financial performance of corporate organizations in Nigeria.

Al-Tuwaijri *et al* (2004) employed simultaneous equations approach to investigate the relations among Ecological disclosure, Ecological performance, and economic performance. They used proxy for Ecological performance using the percentage of total waste generated recycled as identified using the TRI database and measure Ecological disclosure using content analysis in four categories, potential responsible parties' designation, toxic waste, oil and chemic and spills and Ecological fines and penalties, disclosures which are largely non-discretionary. The result showed that there is a positive association between Ecological performance and Ecological disclosure.

**Research Design**

In line with the problem and objective of this study, the appropriate research design for this study is ex post facto research design. Ndiyo (2015) explained that ex post facto (i.e. after the fact) research design is a design that is embarked on after the event has taken place, and the data are already in existence. Ex post facts research is a logical experimental investigation in which the researcher does not have uninterrupted manipulation of independent variables because their expressions have at present happened or because they are essentially not influenced (Kpolovie, 2010). The design permits the measurement of changes in a variable from one period to another (i.e., the description of patterns of change over time). Also, time series studies facilitate the prediction of future outcomes based upon earlier factors. In overall, this design is tailored after a quantitative approach whereby secondary data ranging from 2011 to 2021 is collected and used for data analysis.

**Population of the Study**
A research population is a collection of individuals or objects known to have similar characteristics. The choice of oil and gas servicing firms in Nigeria was premised on the fact that they have cogent similarities with respect to size, structure, management and operation (Akinsanya, 1992). The population of this study are nine (9) oil and gas firms in Nigeria were randomly selected.

**Method of Data Collection/Instrumentation**
Data used for the current study were extracted from the Central Bank of Nigeria Statistical Bulletin for the years under investigation. Data collection was primarily done by means of electronic retrieval approach. However, the archives of the Central Bank of Nigeria Statistical Bulletin were also explored majorly as confirmatory role. Some levels of caution were observed in extracting the data from the Central Bank of Nigeria Statistical Bulletin. For instance, we were mindful of missing data.

**Method of Data Analysis**
Consistent with the positivist research philosophy and quantitative design, the employed technique of inferential analysis in this study is parametric statistics. This technique is related with the use of quantitative models that seek to establish relationship between two variables by using sample-based parameters as measures to infer about the population of the study. The data analysis was executed in three distinct stages. Firstly, a univariate (or descriptive) analysis was executed, followed by bivariate analysis and lastly, multivariate analysis.

**Model Specification**
Following the hypothesis earlier formulated, a REGRESSION MODEL is formulated to capture the effect of Ecological cost and financial performance. This model will help in testing the stated hypotheses of the study and in achieving the objectives earlier stated. The measures for Ecological cost used for this study are Waste Management Cost (WMC) and Ecological Compensation Cost (ECC). These are the independent variables. Return on Asset and Earnings per share represent the financial performance of the firms.
To ascertain the extent to which Ecological cost have affected the financial performance of oil and gas firms in Nigeria, the following relationship is shown below:

**MODEL 1**: A Regression Analysis of the effect of firm's Ecological cost on its financial performance as measured by the return on assets (ROA).

$$ROA\ it = f\left(WMC,\ ECC_{it,}uit\right) \quad (1)$$

$$ROA = \beta_1 + \beta_2 WMC + \beta_3 ECC \quad (3)$$

Where:
ROA = dependent variable, Return on Assets. It is the parameter that measures financial performance to be determined.
WMC = Waste Management Cost. It is an independent variable. It is a factor that influences financial performance
ECC = Ecological Compensation Cost. It is an independent variable. It is a factor that influences financial performance
$\beta_2$ = the coefficient of the independent variable (Waste Management Cost)
$\beta_1$ = the constant term which represent the intercept of the equation.
**Model 2:** A Regression Analysis of the effect of firm's Ecological Cost on its financial performance as measured by the Earnings per share

$$Earnings\ per\ Share = \left(WMC_{it},\ ECC_{it,}uit\right) \quad (3)$$

$$Earnings\,per\,Share = \beta_4 + \beta_5 WMC + \beta_6 ECC + \mu_1 \quad (4)$$

Between Ecological cost and financial performance of oil and gas firms in Nigeria.

Descriptive analysis is used to describe the basic features of the data. Descriptive statistics involve the use of the mean, median, skewness, kurtosis, and Jarque Bera statistics to capture the characteristics of the variables under investigation. Other measures of descriptive estimates like the standard deviation and variance were also employed so as to see the degree of variability of these estimates. The Inferential Statistics involve the use of Panel Data Analysis of fixed effect and random effect to examine the relationship between Ecological cost and financial performance and to also examine if the effects are statistically significant.

**Presentation of Data**

The table contains the different proxies for the independent variables which include; waste management cost and compensation cost (WMC), and Compensation cost (CC). The dependent variables include: Return on asset (ROA), earning per share (EPS).

Table 4.1 Transformed data (see Appendixes A and B)

| YEAR | ECA Million | FP NGN Million | WMC | CC Million | ROA | EPS | ECAFP | OREV | EF |
|---|---|---|---|---|---|---|---|---|---|
| 2011 | 7.75975 | 4.74156 | 3.35943 | 6.59947 | 3.41640 | 2.77815 | 2.19231 | 4.45844 | 6.25065 |
| 2012 | 1 | 5 | 7 | 9 | 7 | 1 | 7 | 1 | 8 |
| 2013 | 7.77764 | 4.80801 | 3.25064 | 6.64002 | 3.27281 | 2.74036 | 2.19675 | 4.38782 | 6,29282 |
| 2014 | 4 | 2 | 3.19284 | 4 | 6 | 3 | 6 | 7 | 8 |
| 2015 | 7.80084 | 4.86093 | 6 | 6.57042 | 3.17906 | 2.32221 | 2.1%64 | 4.3141 | 6.33088 |
| 2016 | 6 | 1 | 3.27788 | 6 | 3 | 9 | 6 | 12 | 8 |
| 2017 | 7.82706 | 4.94753 | 4 | 6.53650 | 3.13691 | 3.94151 | 2.23325 | 4.31710 | 6.38730 |
| 2018 | 4 | 8 | 2.95356 | 8 | 1 | 1 | 2.29444 | 1 | 1 |
| 2021 | 7.83899 | 5.00297 | 6 | 6.25100 | 3.02147 | 3.99299 | 4 | 4.07535 | 6.42098 |
| | 6 | 6 | 2.59061 | 5 | 9 | 5 | 2.48455 | 3.89305 | 6 |
| | 7.83207 | 5.14034 | 9 | 6.07638 | 3.01216 | 3.92220 | 6 | 6 | 6.48620 |
| | 7.83563 | 7 | 2.90058 | 6 | 2 | 6 | 2.48557 | 4.10788 | 8 |
| | 3 | 5.08314 | 6 | 6.25561 | 3.16746 | 3.62838 | 9 | 7 | 6.45938 |
| | 7.84385 | 3 | 2.61878 | 6.57126 | 5 | 9 | 2.48672 | 4.11136 | 8 |
| | 5 | 5.07189 | 2.60053 | 6 | 3.14404 | 3.02530 | 8 | 4 | 6.45787 |
| | 7.85648 | 5 | 7 | 6.54766 | 5 | 6 | 2.48706 | 4.10596 | 5 |
| | 8 | 5.09729 | | 4 | 3.16970 | 4.11660 | 8 | 8 | 6.47688 |
| | | 1 | | | 4 | 8 | | | 9 |

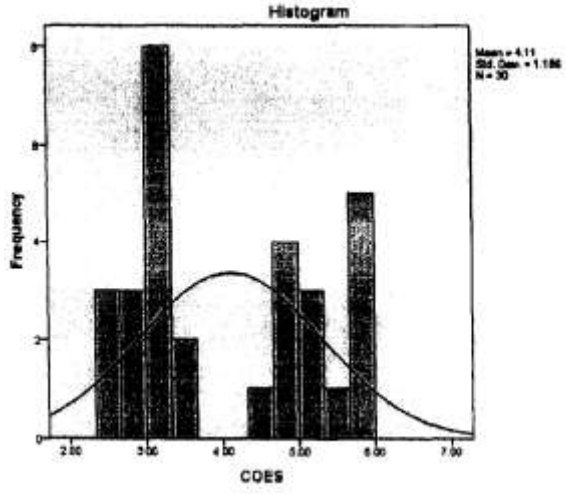
**Source:** Researcher Scholarly Computation, 2024.

Data Analysis
Unlvarlate Analysis

**Table 4.2:** Descriptive Statistics of performance of oil and gas firms (POGMC)

| | N | Mini | Maxi | Mean | Std. Dev. | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| | Stat | Stat | Stat | Stat | Stat | Stat | Std. Error | Stat | Std. Error |
| POGMC | 30 | 2.59 | 6.00 | 4.1059 | 1.18577 | .329 | .427 | -1.510 | .833 |
| Valid N (listwise) | 30 | | | | | | | | |

**Source:** SPSS Output



The results in table 4.2 had shown descriptive statistics of performance of oil and gas firms (POGMC).

**Table 4.3:** Descriptive Statistics of Return on assets (ROA)

| | N | Mini | Maxi | Mean | Std. Dev. | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| | Stat | Stat | Stat | Stat | Stat | Stat | Std. Error | Stat | Std. Error |
| ROA | 30 | 4.43 | 6.64 | 5.7404 | .76293 | -.490 | .427 | -1.407 | .833 |
| Valid N (listwise) | 30 | | | | | | | | |

**Source:** SPSS Output

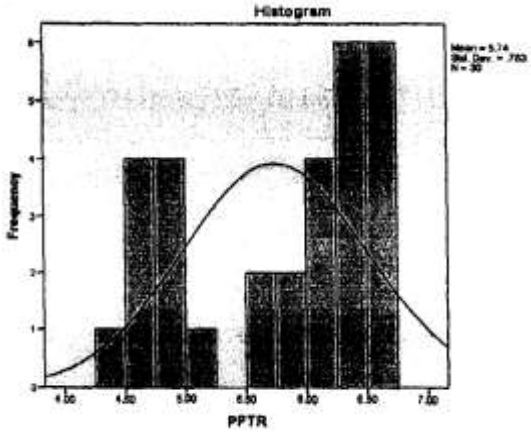
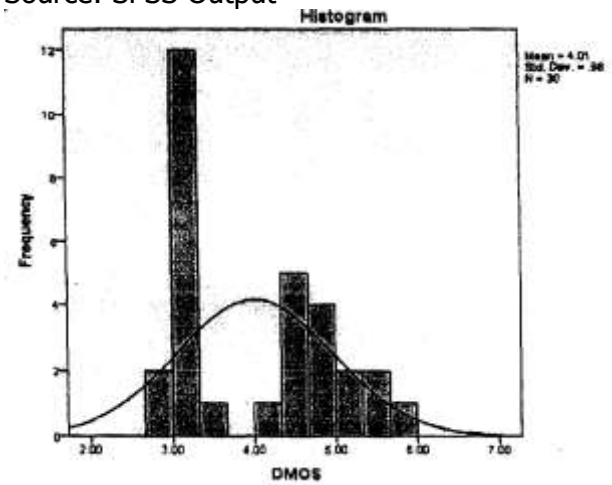



Table 4.3 above showed the descriptive statistics of return on assets (ROA).

**Table 4.4:** Descriptive Statistics of Earnings per shares (EPS)

| | N | Mini | Maxi | Mean | Std. Dev. | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| | Stat | Stat | Stat | Stat | Stat | Stat | Std. Error | Stat | Std. Error |
| EPS | 30 | 2.93 | 5.82 | 4.0122 | .96026 | .346 | .427 | -1.475 | .833 |
| Valid N (listwise) | 30 | | | | | | | | |

Source: SPSS Output



The results in table 4.4 had shown descriptive statistics of Earnings per share (EPS).

**Table 4.5:** Descriptive Statistics of ecological cost accounting (ECA)

| | N | Mini | Maxi | Mean | Std. Dev. | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| | Stat | Stat | Stat | Stat | Stat | Stat | Std. Error | Stat | Std. Error |
| ECA | 30 | .00 | 5.00 | 3.5832 | 1.02656 | -1,485 | .427 | 3.659 | .833 |
| Valid N (listwise) | 30 | | | | | | | | |

**Source:** SPSS Output

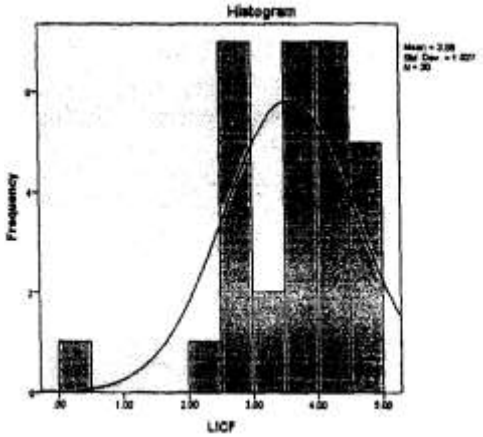
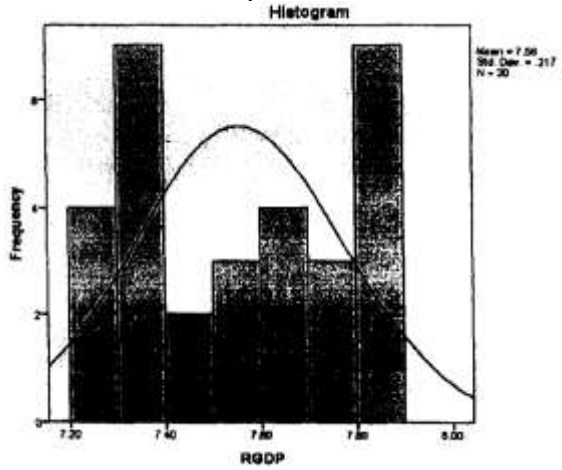



Table 4.5 above showed the descriptive statistics of ecological cost accounting (ECA).

**Table 4.6:** Descriptive Statistics of Compensation Cost (CC)

| | N | Mini | Maxi | Mean | Std. Dev. | Skewness | | Kurtosis | |
|---|---|---|---|---|---|---|---|---|---|
| | Stat | Stat | Stat | Stat | Stat | Stat | Std. Error | Stat | Std. Error |
| CC | 30 | 7.28 | 7.86 | 7.5566 | .21712 | .076 | .427 | -1.687 | .833 |
| Valid N (listwise) | 30 | | | | | | | | |

**Source:** SPSS Output




The results in table 4.6 had illustrated a descriptive statistics of compensation cost (CC).

**Bivariate Analysis**

**Table 4.9:** Correlations Coefficient of Model One **. Correlation is significant at the 0.01 level (2-tailed).*. Correlation is significant at the 0.05 level (2-tailed). **Source:** SPSS Output. The results in table 4.9 indicated a correlation coefficient of R= - 0.841 which illustrated negative correlation between ecological cost accounting (ECA) and financial performance of oil and gas firms (FPOGMC) with a P value 0.000 < 0.05 alpha level. This implied that there is a negative correlation between ecological cost on oil and gas firms in Nigeria. The results in table 4.9 also revealed a correlation coefficient of R value 0.913 which illustrated positive relationship between waste management cost and compensation cost with a P value 0.000 < 0.05 alpha levels. This implied that there is a positive relationship between ROA and EPS in Nigeria.

According to the results in table 4.9 revealed a correlation coefficient of R value - 0.763 which discovered negative relationship between waste management cost and ROA with a P value 0,000 < 0.05 alpha levels. This means that there is a negative relationship between WMC and ROA in Nigeria.

**Discussion of Findings**

**Ecological Cost Accounting and Financial Performance of Oil and Gas**

The correlation and regression findings presented results in table 4.9 and table 4.14 discovered a negative R value -0.841 and a significant level between ecological cost accounting (ECA) and accounting and oil and gas firms (OGMC) for the period under study in Nigeria. The probability value P 0.010<0 .05. Thus, the correlation coefficient and regression coefficient were discovered negative correlation and statistically significant between ecological cost accounting (ECA) and oil and gas firms (OGMC) at 0.05 alpha level for the period 1990 to 2021 in Nigeria. The findings concur with Akinleye et al (2021); Jabir et al. (2020); Olawunnii et al. (2018); Ojong, et at (2016); Omodero and Ehikioya (2020); Ogbonna and Appah (2012); whose results was discovered statistically significant negative relationship in Nigeria.

**Waste Management Cost**

The correlation and regression findings presented results in table 4.9 and table 4.14 discovered a positive R value 0.913 and a significant level between waste management cost and return on asset for the period under study in Nigeria. The probability value P= 0.000<0.05, Thus the correlation coefficient and regression coefficient were discovered significant positive relationship between compensation cost and earnings per shares at 0.05 alpha levels for the period 1990 to 2021 in Nigeria. The findings of the study are in conformity with Eganga et al (2020); Igwe et at (2015); Ugwo et at (2021); Salami, et at (2018); Olayungbo (2021); Olawunmi et al. (2018); Obaretin and Monye-Emina (2021); Okezie and Azubuike (2016) whose study discovered a positive and significant relationship in Nigeria.

**Compensation Cost and Earnings Per Share**

The correlation and regression findings presented results in table 4.9 and table 4.14 discovered a negative R value -0.763 and statistical insignificant level between compensation cost and earnings per shares for the period under study in Nigeria. The probability value P 0.380>0.05. Thus the correlation coefficient and regression coefficient was discovered insignificant negative relationship between compensation cost and earnings per share at 0.05 alpha levels for the period 1990 to 2021 in Nigeria. The findings of the study are in conformity with Ojong, et a! (2016); Omodero and Ehikioya (2020); Ogbonna and Appah (2012); Nwoba and Abah (2017) whose results indicated a negative and statistical insignificant relationship in Nigeria.

**Financial Performance**

The correlation and regression findings presented results in table 4.9 and table 4.14 discovered a negative R value -0.261 and statistical insignificant return on assets and earnings per shares for the period under study in Nigeria. The probability value P= 0.094 > 0.05 alpha level. Thus, the

correlation coefficient and regression coefficient were discovered insignificant negative relationship between financial performance of oil and gas firms and waste management at 0.05 alpha levels for the period 1990 to 2021 in Nigeria. The findings concur with Akinleye et al (2021); Jabir et al. (2020); Olawunmi et al. (2018); Ojong, et al (2016); Omodero and Ehikioya (2020) whose results was discovered statistically insignificant negative relationship in Nigeria for the period under study.

**Summary of Findings**

This study investigated the relationship between Ecological Cost Accounting and Financial Performance of Listed Oil and Gas Firms in Nigeria from 1990 to 2021. The study explores descriptive, correlation, and regression analyses. The study made use of secondary data variables such as waste management cost (WMC) and compensation cost (CC) were dimensions of Ecological Cost Accounting used in the study. On the other hand, Financial Performance was measured through Return on Asset (ROA) and Earnings Per Shares (EPS). The empirical findings were illustrated as followed:

## CONCLUSION

The study investigated the association between ecological cost accounting (ECA) and accounting and oil and gas firms (OGMC) in Nigeria. The need for ecological cost accounting generation cannot be overemphasized due to the importance to economic growth in Nigeria. The results obtained indicate that waste management cost negatively influence return on asset in Nigeria; compensation cost positively affect earnings per shares in Nigeria.

## RECOMMENDATIONS

Based on the findings made in the course of this study, the following recommendations are hereby suggested:

The study recommends that Nigeria government should reexamine its oil and gas firms' strategy by way of decreasing ecological cost to improve the economic growth. The government should be consistent with policies that will bring about sustainable growth in the oil revenue to evaluate the domestic oil and gas firms' operations that will improve the country and reduce ecological cost. Adequate provisions should be made by the federal government to tackle unemployment and underdevelopment of the oil producing communities over the cry for ecological cost implication.

**Implications/Contribution to scholarship**

The empirical results of this investigation provide implication for the ongoing policy debate in ecological cost accounting and financial performance of oil and gas firms in Nigerian. The government should know that in order to implement ecological cost revenue generation, the government and other oil and gas firms should be worried about inter relationships among the oil and gas firms' constructs.

## REFERENCES

Adeoye, A.A. (2015). Impact of the Nigerian capital market on the economy. *European Journal of Accounting Auditing and Finance Research,* 3(2), 1 – 9.

Adewoye, J.O. & Adenike, A. T. (2018). Investment in accounting information system and sales growth: An investigation of Nigeria small and medium enterprise. *Journal of Accounting and Taxation,* 10(6), 71-77.

Agbiogwu, A.A., Ihendinihu, J.U. & Okafor, M.C. (2016). Impact of environmental and social costs on performance of Nigerian manufacturing companies. *International Journal of Economics and Finance,* 8(9), 173-180.

Agyapong, A. & Nuertey, D. (2017). The effect of corporate social responsibility on organizational commitment of employees of rural and community banks in Ghana. *Cogent Business & Management,* 4(1), 128-895

Ahmad, T., Chen, H., Guo, Y. & Wang, J. (201 8). A comprehensive overview on the data driven, and large scale based approaches for forecasting of building energy demand: A review. *Energy and Buildings,* 165, 301-320.

Ali, M. E. (2002). Transfer of sustainable energy technology to developing countries as a means of reducing greenhouse gas emission – the case of Bangladash. *Review of Relevant Literature,* 8(2), 10 – 15.

Bessong, P.K. & Tapang, A.T. (2012). Social responsibility cost and its influence on the profitability of Nigerian banks. *International Journal of Financial Research,* 3(4), 33- 45.

Bhattacharya, C. B., Korschun, D., & Swain, S. D. (2011). Corporate social responsibility, customer orientation, and the job performance of frontline employees. *Journal of ,* 78(3), 20-37.

Boyd, J. (1998). The benefits of improved environmental accounting. An economic framework to identify priorities (No. 1318-2016-103115).

British American Tobacco Nigeria (2010). Undermines the WHO FCTC through agricultural initiatives: invited commentary. *Tobacco Control,* 21(2), 220-220.

Campbell, D. & Slack, R. (2006). Public visibility as a determinant of the rate of corporate charitable donations. Business Ethics: *A European Review,* 15(1), 19-28.

Canadian Institute of Chartered Accountants (1993). Environmental costs and liabilities: Accounting and financial reporting issues (Toronto: CICA).

Chang (2015). The impacts of environmental performance and propensity disclosure on financial performance: Empirical evidence from unbalanced panel data of heavy- pollution industries in China. *Journal of Industrial Engineering and Management,* 8(1), 2 1-36.

Che-Abmad, A., Osazuwa, N. P. & Mgbame, C.O. (2015). Environmental accounting and firm profitability in Nigeria: Do firm-specific effects matter? *IUP Journal of Accounting Research & Audit Practices,* 14(1).

Danso, A. & Adomako, S. (2014). The financing behaviour of firms and financial crisis. *Manag. Financ.*, 40,1159 – 1 174.

Dwivedi, I. (2002). Environmental accounting and profitability of selected listed oil and gas companies in Nigeria (2012-2017). *Journal of Accounting and Financial Management,* 7(3), 22-39.

Eduardo, F.D.P., Bezinelli, L., Luiz, A.C., Correa, L., Vogel, C. & Eduardo, C.D.P. (2011). Severity of oral mucositis in patients undergoing hematopoietic cell transplantation and an oral laser

phototherapy protocol: a survey of 30 patients. *Photomedicine and laser surgery,* 27(1), 137-144.

Eilola, M. (2017). The link between corporate environmental performance and corporate financial performance. Master's thesis submitted to Jyväskyla University School of Business and Economics, 1-67.

Ferri, F. & Maber, D.A. (2013). Say on pay votes and CEO compensation: Evidence from the UK. *Review of Finance,* 17(2), 527-563.

Freeman, A.B. (2017). Towards an epistemology for radical accounting: Beyond objectivism and relativism. *Critical Perspective on Accounting,* 6(1), 485-496.

Friedman, D.1. & Jacobson, D.M. (2002). Diagnostic criteria for idiopathic intracranial hypertension. *Neurology*, 59(10), 1492-1495.

Friedman, M. (1970). Comment on Tobin. *The Quarterly Journal of Economics,* 84(2), 3 18-327.

Gatimbu, K.K. & Wabwire, J.M. (2016). Effect of corporate environmental disclosure on financial performance of firms listed at Nairobi securities exchange, Kenya. *International Journal of Sustainability Management and Information Technologies,* 2(1), 1-6.

Gbalam, E. & Uzochukwu, A. (2020). Working Capital Management and Firm Profitability: An Empirical Examination. *IOSR Journal of Economics and Finance (IOSR-JEF)*, 11(2), 45-51.

Hybels, R.C. (1995). On legitimacy, legitimation and organizations: A critical review and integrative theoretical model. *Academy of Management Journal,* 23 1-245.

Ifurueze, A., Etale, M. & Binglar, I. (2013). Environmental accounting and profitability of selected listed oil and gas companies in Nigeria (2012-2017). *Journal of Accounting and Financial Management,* 7(3), 22-39.

Ifurueze, M.S., John-Akamelu, R.C. & lyidiobi, F.C. (2013). Effect of corporate tax aggressiveness on firm growth in Nigeria: An empirical analysis. *International Journal of Trend in Scientific Research and Development (IJTSRD),* 2(6), 1628- 1639.

Imran, A., Kashif, P., Syed, J. & Mario, I. (2010). Social Accounting and Financial Performance of Oil and Gas Companies in Nigeria (2012-2017). *European Journal of Business, Economics and Accountancy,* 8(1), 29-41.

International Federation of Accountants (2005). International Guideline Documents: Environment Management Accounting, New York.

Ironkwe, E. & Ordu, P.A. (2017). Corruption in oil and gas industry and oil revenue in Nigeria.

Ironkwe, U.I. & Success, G.O. (2017). Environmental accounting and sustainable development: A study of Niger Delta Area of Nigeria. *International Journal of Business and Management Invention,* 6(5), 1-12.