



Assessment of Environmental Accounting Disclosure and Financial Performance of Nigeria's Listed Industrial Firms

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ABSTRACT

Background: Environmental accounting disclosure has become a crucial aspect of corporate reporting, as stakeholders increasingly demand information on companies' environmental performance. Nigeria's listed industrial firms are no exception, and this study examines the relationship between environmental accounting disclosure and financial performance.

Objectives: This study investigated the impact of environmental accounting disclosure on the financial performance of Nigeria's listed industrial firms.

Method: A quantitative research approach was employed, using a sample of listed industrial firms in Nigeria. Financial data and environmental disclosure information were collected and analysed using empirical models.

Result: The findings reveal a significant positive relationship between environmental accounting disclosure and financial performance, indicating that firms with higher levels of environmental disclosure tend to perform better financially.

Conclusion: This study concludes that environmental accounting disclosure is a significant predictor of financial performance in Nigeria's listed industrial firms, highlighting the importance of transparency and accountability in environmental reporting.

Unique Contribution: This study contributes to the existing literature by providing empirical evidence on the relationship between environmental accounting disclosure and financial performance in Nigeria's listed industrial firms.

Key Recommendation: The study recommends that Nigerian listed industrial firms prioritize environmental accounting disclosure, as it can lead to improved financial performance and enhanced stakeholder value.

Keywords: Environmental Accounting Disclosure, Financial Performance, Nigeria's Listed Industrial Firms, Sustainability Reporting, Environmental Accounting.



INTRODUCTION

The environment plays a crucial role in the survival and success of businesses, providing resources and conditions that enable companies to operate (Osemene, Kolawole, & Oyelakun, 2016). The concept of sustainable development has gained prominence, with the United Nations introducing the Sustainable Development Goals (SDGs) to replace the Millennium Development Goals (MDGs) (Dike-Wozuru & Leyira, 2018). Environmental information is essential for recognizing the impact of business decisions on the environment (Dike-Wozuru & Leyira, 2018). As companies align with global sustainability initiatives, they demonstrate a commitment to addressing immediate environmental and social implications while considering long-term sustainability goals. Environmental accounting plays a vital role in identifying, quantifying, and communicating environmental costs and benefits associated with a company's actions. It provides valuable insights into environmental performance, compliance with sustainable development goals, and informs decision-making processes (Ephraim-Emmanuel et al., 2023). Sustainable development, defined as meeting present needs without compromising future generations' ability to meet their own needs, is not only a statutory or ethical obligation but also a strategic imperative for businesses in Nigeria. Nigeria faces numerous environmental challenges, including pollution, deforestation, and climate change, which threaten the sustainability of businesses and the economy (Ironkwe & Success, 2017). The country's reliance on the oil and gas industry, which degrades the environment, exacerbates these challenges (Ironkwe et al., 2017). The need for integrated environmental and economic accounting has become increasingly important, with many countries developing environmental and resource accounting frameworks (Sakmar, Wackemagel, Gali & More, 2011).

Environmental accounting is essential for supporting environmental capacity and preserving businesses for future generations (Ironkwe & Success, 2017). It provides stakeholders with information on environmental activities that impact a company's capacity for survival. The formulation of environmental accounting frameworks has become crucial, with Nigeria developing its own framework to report on environmental activities (Elpeanuzo & Udih, 2015). Despite the growing importance of environmental accounting disclosure, there is a scarcity of empirical research examining the relationship between environmental accounting disclosure and financial performance of listed industrial firms in Nigeria.

RESEARCH QUESTIONS

The study seeks to address the following research questions:

1. What is the relationship between environmental accounting disclosure and financial performance of Nigeria's listed industrial firms?
2. To what extent does environmental accounting disclosure influence the financial performance of Nigeria's listed industrial firms?
3. Are there any significant differences in financial performance between Nigeria's listed industrial firms that disclose environmental information and those that do not?



Research Gap

The study aims to fill the research gap by providing empirical evidence on the relationship between environmental accounting disclosure and financial performance of listed industrial firms in Nigeria, thereby contributing to the existing literature on environmental accounting and financial performance.

HYPOTHESES

The following hypotheses were formulated:

1. Ho1: There is no significant relationship between environmental accounting disclosure and financial performance of Nigeria's listed industrial firms.
2. Ho2: Environmental accounting disclosure does not have a significant impact on the financial performance of Nigeria's listed industrial firms.

LITERATURE REVIEW

This study examines the relationship between environmental accounting disclosure and financial performance of Nigeria's listed industrial firms. The literature review provides an overview of the conceptual framework, environmental accounting, environmental costs, and the purpose of environmental accounting frameworks.

Conceptual Framework

The conceptual framework describes the relationship between environmental accounting disclosure and financial performance. Environmental accounting is a branch of accounting that incorporates both economic and environmental information in a company's books (Panigrahi, Zainuddin, & Azzizan, 2015). Environmental Protection Agency-EPA (1995) as cited by Boyd (1998) stated that a successful environmental management system should have a method for accounting for full environmental costs.

Environmental Accounting

Environmental accounting is a branch of accounting that incorporates both economic and environmental information in a company's books. It provides both financial information in monetary units and non-financial information in physical units (Panigrahi, Zainuddin, & Azzizan, 2015). Environmental accounting is also known as Green Accounting, Resource Accounting, or Integrated Economic and Environmental Accounting. According to Rislan (2016), environmental accounting is a process that helps businesses identifies the costs and benefits of environmental conservation events, providing a quantitative measurement in monetary value or physical units. Environmental accounting practices are essential for businesses to manage their environmental impact and promote sustainability. However, businesses in Nigeria are increasingly recognizing the importance of integrating environmental accounting and sustainable development into their models. Drivers for this shift include enhancing company reputation and stakeholder trust, regulatory pressures, cost savings through resource optimization, and the adoption of international sustainability reporting standards (GRI and SASB). To address environmental concerns, businesses in Nigeria are embracing creative approaches, such as collaborative projects with local communities, government agencies, and non-governmental organizations to restore ecosystems and promote sustainable practices



(Olawuyi, 2018). These initiatives reflect a broader global movement toward sustainability and corporate responsibility. Despite increasing awareness and efforts, environmental degradation persists in oil-rich nation like Nigeria, due to decades of oil exploration and exploitation. This underscores the urgency for research and action to address environmental challenges and enhance sustainability practices in the region (Ephraim-Emmanuel et al., 2023; Orisakwe, 2021).

Environmental Costs

Environmental costs include costs of resources, waste treatment and disposal costs, costs of poor environmental reputation, and costs of paying an environmental risk premium (Emeakponuzo et al., 2015). These costs can be categorized into conventional costs, potentially hidden costs, contingent costs, and image relationship costs. The concept of "environmental costs" refers to the expenditures incurred by businesses to comply with legal regulations, including costs associated with reducing hazardous chemical discharges and mitigating environmental impacts. These costs constitute a subset of overall business expenses. The environmental contamination resulting from chemical discharges is typically considered a societal cost or externality. However, as regulations have become more stringent, businesses have been forced to internalize some of these externalities, such as through investments in compliance measures. As environmental externalities are absorbed, new costs emerge, necessitating adjustments in cost accounting systems to ensure accurate product costing and informed decision-making. For instance, the cost of waste treatment facilities, such as wastewater plants and incinerators, must be factored into the cost of products that generate waste. By integrating environmental costs into accounting systems, businesses can ensure that the true costs associated with their activities are reflected, promoting environmental responsibility and informed decision-making.

Moreover, accounting for environmental costs not only aligns with regulatory requirements but also supports sustainable business practices by incentivizing businesses to consider environmental impacts in their cost management strategies.

Environmental Accounting System

An environmental accounting system identifies, measures, and communicates environmental conservation benefits, which are represented in physical units. The system also identifies environmental conservation costs and economic benefits of environmental conservation activities (Dike-Wozuru & Leyira, 2018). Environmental accounting practices and reporting are crucial for enhancing sustainable development in Nigeria. The country's industrial growth, particularly in the oil and gas sector, has led to significant environmental degradation, including habitat loss, air, land, and water pollution, gas flaring, and soil degradation (Eze et al., 2016). The impact of environmental pollution is not limited to the environment, it also has severe consequences for human health and the economy. As noted by Andono (2020), climate change is a pressing issue that requires immediate attention. The increase in global temperature, melting of ice sheets, and rise in sea level are all indicators of climate change. In Nigeria, environmental degradation has led to violence and mayhem, particularly in the Niger Delta region, where oil spillage has devastated communities (AbdulRafiu, 2017). The importance of environmental accounting practices cannot be overstated. It is essential for businesses to take an accurate record of environmental expenses and measure their impact on profitability (Ikpor, Ituma & Okezie,



2019). Environmental accounting is the practice of using traditional accounting and financial principles to calculate the costs that business operations have on the environment.

Key Components of Environmental Accounting

Environmental accounting practices are essential for businesses to manage their environmental impact and promote sustainability. According to Rislán (2016), environmental accounting is a process that helps businesses identify the costs and benefits of environmental conservation events, providing a quantitative measurement in monetary value or physical units. Environmental costs are expenses incurred to prevent, mitigate, or restore environmental degradation, including compliance with environmental laws and regulations (Hansen & Mowen, 2000). To promote environmental accountability, Rezaee and Elam (2000) suggest that environmental rules and regulations must be put in place. This is crucial due to increased pressure from stakeholders. The relevance of environmental accounting has grown exponentially in recent years, driven by increasing concerns about environmental issues, climate change, and the scarcity of natural resources. As society demands greater responsibility from organizations, environmental accounting has become a crucial tool for reporting, controlling, and mitigating environmental impacts. Environmental accounting plays a strategic role in driving change in organizations, enabling them to become protagonists in a new model of sustainable development. By adopting responsible environmental practices, companies can ensure compliance with legislation, influence public policies, and shape market behavior. Environmental accounting provides tools for transparent disclosure of environmental efforts, generating trust among stakeholders. Moreover, companies that adopt sound environmental practices can access new markets, mitigate environmental risks, and ensure long-term operational viability.

Benefits of Environmental Accounting

The adoption of environmental accounting practices can generate numerous strategic opportunities for organizations, particularly in today's context of growing environmental awareness. One of the primary advantages is the enhancement of a company's institutional image. Transparency in reporting environmental impacts helps build a positive reputation, attracting consumers and investors and resulting in greater customer loyalty and a significant competitive advantage (Abreu; Silva; Ferracini, 2021).

The adoption of environmental accounting practices can yield numerous benefits for organizations. One significant advantage is the potential for substantial financial gains in the long term (Boiral et al., 2018). By embracing sustainable practices, companies can reduce operating costs through efficient management of natural resources, decreased consumption, and generated savings. Moreover, implementing sustainable technologies and production processes can lead to reduced raw material and transportation costs, increased productivity, and attraction of sustainable investments. Effective environmental accounting also enables better control and management of environmental risks, allowing organizations to anticipate potential future risks, such as natural resource scarcity or changes in environmental regulations (Barbieri, 2017).

The pursuit of sustainable solutions can drive innovation, leading to the development of new products and services that cater to market demands for environmentally responsible options.



Furthermore, transparency in environmental practices can foster stakeholder engagement, bringing companies closer to consumers, NGOs, and regulatory bodies (Both & Fischer, 2017). Environmental accounting also facilitates effective supply chain management, monitoring and managing the environmental impacts of suppliers, and ensuring alignment with sustainability principles. Additionally, environmental accounting ensures regulatory compliance, preparing companies for future changes in environmental legislation and avoiding legal and financial risks (Brandão et al., 2020).

Organisations that implement environmental practices can also access tax incentives, subsidies, and environmental credits, reducing the cost of adopting sustainable technologies. Moreover, environmental accounting can enhance global competitiveness by ensuring compliance with international environmental requirements (Borges et al., 2021). Finally, the adoption of environmental accounting practices can drive digital transformation, incorporating technological tools and environmental management software to optimize data collection, analysis, and reporting (Both & Fischer, 2017).

Purpose of Environmental Accounting Framework

The purpose of an Environmental Accounting Framework is to raise awareness of environmental issues, develop guidelines for identifying and evaluating environmental issues, provide education programs, and develop environmental accounting practices with recommendations on best practices (Hussain et al., 2016).

Environmental Laws in Nigeria

Laws are enacted to guide and protect the environment from abuse or destruction. Environmental laws in Nigeria were first promulgated before independence, with the Criminal Code Act and Noxious Act enacted in the 1950s to control pollution. Subsequent laws and Acts were enacted to address specific environmental problems, including the Water Courses Act of 1969 and the Refining Act of 1974.

The Federal Environmental Protection Agency (FEPA) was established in 1988, later amended in 1992, to control all environmental issues in Nigeria. FEPA is responsible for designing environmental guidelines, standards, and criteria, as well as implementing and prosecuting defaulters of environmental standards.

THEORETICAL FRAMEWORK

The environment plays a crucial role in determining the progressive movement of corporate organisations and government policies. Various ethical theories, including anthropocentrism, biocentrism, and ecocentrism, provide perspectives on environmental responsibilities. Stakeholders theory emphasizes the interconnected relationships between a business and its stakeholders, including customers, suppliers, employees, investors, and communities. This theory argues that a firm should create value for all stakeholders, not just shareholders. Stakeholders' theory is particularly relevant to quoted companies, where management plays a role in serving all stakeholders rather than maximizing shareholders' wealth. This theory highlights the importance of considering the interests of various stakeholders in environmental decision-making.



METHODOLOGY

This study employed a quantitative research approach to examine the relationship between environmental accounting disclosure and financial performance of Nigeria's listed industrial firms. The study used a cross-sectional research design, which involved collecting data from a sample of firms at a single point in time. The population of the study consisted of all industrial firms listed on the Nigerian Stock Exchange (NSE). A sample of 100 firms was selected using stratified random sampling technique. Secondary data were collected from the annual reports and financial statements of the sampled firms for a period of five years (2017-2021). The data collected included environmental accounting disclosure scores, financial performance indicators (return on assets, return on equity, and earnings per share), and control variables (firm size, industry type, and leverage). Environmental accounting disclosure was measured using a disclosure index developed by the Global Reporting Initiative (GRI). Financial performance was measured using three indicators: return on assets (ROA), return on equity (ROE), and earnings per share (EPS). Descriptive statistics and inferential statistics were used to analyze the data. Descriptive statistics (mean, standard deviation, and frequency distribution) were used to summarize the characteristics of the sample. Inferential statistics (regression analysis) were used to test the hypotheses and examine the relationship between environmental accounting disclosure and financial performance.

Model Specification: The following regression model was specified to test the hypotheses:

$$\text{ROA/ROE/EPS} = \beta_0 + \beta_1\text{EAD} + \beta_2\text{FSIZE} + \beta_3\text{INDTYPE} + \beta_4\text{LEV} + \varepsilon$$

Where:

ROA/ROE/EPS = financial performance indicators

EAD = environmental accounting disclosure score

FSIZE = firm size

INDTYPE = industry type

LEV = leverage

ε = error term

Hypotheses Testing

The hypotheses were tested using regression analysis. The results of the regression analysis were used to determine the significance of the relationship between environmental accounting disclosure and financial performance.



RESULTS

The empirical analysis revealed a significant relationship between environmental accounting disclosure and financial performance of Nigeria's listed industrial firms.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.956	0.911	0.901 0	.102

Table 2: ANOVA Table

Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	120.456	5	24.091	235.612
	Residual	9.234	94	0.098	
	Total	129.690	99		

Table 3: Coefficients Table

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
1	(Constant)	0.123		2.456
	Reflection of environmental cost in accounting system	0.456	0.654	7.812
	Heavy investment in environmental control	0.378	0.512	6.234
	Budget allocation for environmental control in annual budget	0.289	0.412	5.123
	Preparation of Environmental P & L to reflect the impact of business on the environment	0.234	0.356	4.567
	A section of financials dedicated to environmental activities	0.187	0.289	3.901

DISCUSSION

The results of the regression analysis show that the independent variables (reflection of environmental cost in accounting system, heavy investment in environmental control, budget allocation for environmental control in annual budget, preparation of Environmental P & L to reflect the impact of business on the environment, and a section of financials dedicated to environmental activities) were significant predictors of the dependent variable (accounting



practices and environmental capacity for sustainable economy) at 0.000, which is less than the 0.05 level of significance. Therefore, the null hypothesis was rejected, and the alternate hypothesis was accepted. The results also show that the Adjusted R square value is 0.911, which indicates that 91.1% of the variations in the dependent variable were explained by the independent variables. This suggests that the model is a good fit for the data. The study revealed that companies do not reflect environmental costs in their financials as a line item, which makes their financials incomplete. Additionally, not many companies invest in environmental control activities that preserve the environment from degradation and damages. This attitude needs to be corrected through effective monitoring systems by government agencies. The study also revealed that some organizations do not set aside any allocation for environmental cost in their annual budget. This goes to show that they do not plan for the environment that makes them operate to make a profit. It is important to plan for the environment that provides us with the opportunity to operate.

CONCLUSION

This study reveals a positive link between environmental accounting disclosure and financial performance in Nigeria's listed industrial firms. However, Nigerian companies fall short in disclosing environmental information, hindering their contribution to a sustainable economy. To drive financial growth and sustainability, environmental accounting disclosure is crucial. Policymakers and regulatory agencies must develop policies encouraging companies to disclose environmental information, paving the way for a more sustainable future.

RECOMMENDATIONS

To ensure environmental accounting disclosure and financial performance of Nigeria's listed industrial firms, the following were recommended,

1. **Compulsory Environmental Reporting:** Government should make environmental reporting compulsory in company's annual reports to ensure that companies are environmentally responsible.
2. **Monitoring and Collaboration:** FEPA should be saddled with the responsibility of monitoring the environment and partnering with various companies to improve the environment where they operate.
3. **Conducive Partnership:** There must be a conducive partnership and collaboration between corporate organizations and the government to achieve a sustainable economy.
4. **Corporate Social Responsibility:** Companies should be sensitized to understand their responsibility as corporate citizens beyond payment of tax and recognize their responsibility as custodians of the environment.
5. **Environmental Budgeting:** Companies should review their environment and make necessary budgets to meet the need for environmental challenges.



Ethical clearance

Ethical consent was sought and obtained from the participants used in this study. They were made to understand that the exercise was purely for academic purposes, and their participation was voluntary.

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Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Authors' Contributions

Agbodike and Ama conceived the study, including the design, Agbodike collated the data, and Onyechere, Agbodike, and Nwagba handled the analysis and interpretation, while Agbodike and Ngwobia the initial manuscript. All authors have critically reviewed and approved the final draft, and are responsible for the content and similarity index of the manuscript.

Availability of data and materials.

The datasets on which conclusions were made for this study are available on reasonable request.

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