International Journal of Modern Innovations &Knowledge (IJMIK)
ISSN:2734-3294
Available on-line at:www.ijmik.net

Volume 2 / Issue 3 / 2021

# Environmental Accounting and Performance of Quoted Manufacturing Companies in Niger Delta Region, Nigeria

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Citation: Nwahaghi, F. U. (2021). Environmental Accounting and Performance of Quoted Manufacturing Companies in Niger Delta Region, Nigeria. *International Journal of Modern Innovation & Knowledge, 2(3)*; 176 – 188.

## Abstract

The study is aimed at examining Environmental Accounting and Performance of Quoted Manufacturing Companies in Nigeria. The study covers a period of ten years from 2008-2017 using only secondary data from ten (10) quoted manufacturing companies in Nigeria. The data for analysis were sourced from published financial reports of quoted manufacturing companies listed in the Nigerian Stock Exchange. To achieve this objective, the study made use of financial reports of manufacturing Companies quoted in the Nigerian Stock Exchange Market from years 2008-2017. Regression analysis was employed with the aid of Statistical Package for Social Sciences (SPSS). The results of the statistical analysis indicate that better environmental performance positively impact business value of an organization. Moreover, environmental accounting provides the organization an opportunity to reduce environmental and social costs and improve their performance.

**Keywords:** Environmental Accounting, Firm performance, Environmental Costs, Manufacturing Companies

## INTRODUCTION

When the environment is affected, man's livelihood is affected too. In that case, a rational being as man is always in deep thought of calculation on how to make maximum use of his environmental resources to better his life. This desire drives a man into various activities which include among others: production of goods and services, seeking for adequate accommodation, urban development, portable water supply among others. Also, the ongoing environmental activities within the environment have impacted on the ecosystem, thereby leading to the environmental reduction, resource exhaustion, and environmental data misuse. Today, environmental degradation and pollution are mostly cause by manufacturing companies whose waste product during construction and manufacturing processes has affected man and its environs. These pollutions are cause chiefly as misuse of waste resources from metal pieces and scraps, melting of aluminum using the blast furnaces, heating and melting of alloys, welding and fabrication of metals, metal tampering among other engineering practice that are not regulated. This development brings about the idea of environmental accounting that is, keeping the records of environmental activities in order to know whether the data generated have a significant impact on the performances of manufacturing companies carrying out these activities.

However, Adediran and Alade (2013) opined that data generated from an environmental survey carried out by the companies and other agencies can be applied within the organizations, but can also be used by the public through disclosure in environmental reports. Uwaigbe and Jimoh (2012) stressed that one way of making use of the environmental data is by way of disclosure and that by this, those users of the information would get an understanding of the company's stance on environmental conservation and how it specifically deals with environmental issues. Again, the deepest thought in man's mind is that one day the environmental resources that are used for manufacturing and construction processes might be exhausted without commensurate reward. Therefore, the enactment of environmental laws and regulations by government become another option so as to protect the environment from being totally ruined. Similarly, due to uncontrolled activities in the environment as a result of "leakages" in the regulatory framework and weaknesses in policy implementation, foundry practice and welding activities have made the development of natural resources and environmental accounting reporting an area of significant interest in Nigeria (Umoren, Akpan & Okafor, 2018).



Environmental accounting as defined by Ministry of Environment (2005) in "Environmental Accounting Guidelines" is an account aimed at achieving sustainable development, maintaining a favorable relationship with the community, and pursuing effective and efficient environmental conservation activities. This type of accounting enables a company to ascertain the cost of conserving the environment while carrying out her normal business activities, discover benefits and gains from such activities, and provide the best means possible for quantitative measurement and encourage the communication of the results. This makes proper disclosure of accounting information relating to the environment is a very important aspect of accountability.

Environmental accounting enables manufacturing companies and other organizations to increase their public trust and confidence. This however will lead to fair assessment of the organizations. According to an environmental protection agency based in USA, environmental costs include costs of complying with environmental laws. The agency specifically stated that it includes environmental remediation costs, pollution control equipment costs and non-compliance penalty. Based on the meaning of environmental degradation, environmental cost could also cover the cost incurred to prevent degradation, cost of re-stating the environment to its original state, cost of restoring depleted environment to its normal position. Profit ascertainment requires the subtraction of recurrent costs from revenues. According to Okafor (2018), most often, the costs that leads to changes in the environment, which affect people adversely and cause damages to the environment are not taken into consideration before profits are determined. In other words, the profits are wrongly determined. The result of this, in most cases, is reporting of wrong and excessive profits which will also mislead the decision makers and hence concern companies' stakeholders and its users became interested in the behavior and damages cause to the environment.

Naturally, stakeholders are also interested in the environmental behaviour of the company. Their attention is paid to economic consequence of environmental behavior of the company and their impacts on return on investment. Other interested parties, for example, customers, suppliers competing companies, state bodies, the public, mass media, movements and initiatives concerned with environmental protection, etc; also pay attention to the company approach to the environment. Some interested parties (for example, the public, movements and initiatives concerned with environmental protection) are primarily interested in impacts of the company activities, products and services on the environment. Therefore, it is obvious that needs in the field of environmental information are very diverse. The task of environmental accounting is to fill information needs of all important interested parties (Jaroslava & Miroslau, 2006). Environmental accounting must therefore be designed so that it provides information enabling users to assess environmental behavior of the company and its economic consequence therefore, parts of the system are both information in monetary units (financial information) and information in physical units (non-financial information). Furthermore, it is necessary to ensure that different information needs of various interested parties are filled. It also means that, the conception of environmental accounting is based on the basic recognition influencing development of accounting system in the 20$^{th}$ century method of reflecting the business process should be differentiated according to the users of the accounting information and according to decision making tasks for support of which the accounting information is used (Kral, 2002).

Environmental Protection Agency (EPA, 2015) declared that environmental cost information can be applied in internal management decisions. The term environmental accounting belongs to the area of accounting -related activity, method and system for recording and analysis (Schaltegger, Bennet, Burritt & Jasch, 2008). Study carried out by Rufelawaty and Budi (2010) discovered that environmental cost information generated through accounting for environment can help in company growth. The absence of such information increases the stress of accounting for costs and struggles to reduce costs to managers. The study by Larrinaga and Babbington (2011) revealed that companies can achieve cost savings that can improve their performance by implementing environmental accounting. Elewa's study in (2007) discovered that implementing environmental accounting leads to profit growth resulting from cost reduction of yearly production. According to De Beer and Friend (2006), environmental accounting has other advantage order than cost reduction. It can also be used to indicate potential for environmentally beneficial investment to yield significant financial benefits by avoiding environmental liability especially in manufacturing companies in Nigeria.

**Statement of the Problem**

Naturally, shareholders care for the attitude of their company regarding the environment. They pay attention to the economic consequence of environmental behaviour of the business and how this behavior impacts on return on investment. Other users of accounting information, such as customers, suppliers, competing companies, state bodies, the public, mass media, movements and initiatives concerned with environmental protection, etc; pay attention also to the company approach to the environment. Investors constantly demand that companies should go for environmental accounting strategies that will reduce environmental damage and increase shareholders' value. The objective of sound environmental management is to enhance environmental report by reducing the environmental impact while increasing the enterprise value and performance. Unfortunately, the unserious attitudes of several forms not take environmental accounting into consideration makes performance below expectation. This is because environmental accounting helps the form to record all environmental costs incurred by the business thereby finding a way of reducing the cost (environmental expenses) so that the business can increase profit. Also, environmental accounting helps from to disclose to the outside world their ability to be environmentally friendly. According to Pramanik, Shil and Das (2007), some of the specific issues (problems) regarding the environmental accounting and reporting include: identification of environmental cost and expenses, capitalization of cost, identification of environmental liabilities and measurement of liabilities. It is based on these observed problems that this study seeks to examine environmental accounting and performance of quoted manufacturing companies in Nigeria.

## Literature Review

**Theoretical Review:** Theories related to this study were review under the following:

### The Social Theories of Accounting

This study examined the theoretical background of environment accounting based on the social theories of accounting. The social theories of environmental accounting discussed in this study include, stakeholder, legitimacy and positive accounting theories. This approach is extended to stakeholder's theory by explaining information disclosure as an obligation and the right of the stakeholders. Stakeholders are groups, which are influenced by the corporate activities or which can affect the corporation. The organization's survival in the long run requires stakeholder's support and approval. The more powerful the stakeholders are, the more the organization must adapt to their interests and demands. According to the legitimacy theory, organization seek to establish congruence between the social values associated with or implied by their activities and the norms of acceptable behaviour in the larger system of which their activities are part.

### Positive Accounting Theory

This theory suggests and explains why firms make voluntary social disclosures. Based on the original work of Watts and Zimmerman (1986), the positive accounting theory has directly sought to establish evidence for the political cost hypothesis as an explanation for firms' social disclosures. Along with numerous others, Gray et al (1995) dismiss the positive accounting arguments on the grounds of the underlying assumptions of the theoretical framework. As they suggest positive theories are not about what (social) reporting should be, but rather about what it is on the face of it, and on the basis for explaining why firms are making social disclosures, positive accounting explanations are less easily dismissed. Casual observations, for example reveals that positives accounting explanation rely on empirical evidence largely identical to that used in support of other explanation (most notably, legitimacy theory) of social disclosure, explanations which, incidentally Gray et al (1995) seem to find more acceptable. As Gray et al (1995) note, a number of empirical studies have shown strong associations between disclosure and firm size, and between disclosure and type of industry. In fact, the size disclosure and type of industry relationship appears empirically the most robust. Such results are claimed in support of legitimacy theory (Patten, 1991; Deegan & Godon, 1996), as well as in favour of positive accounting theory.

**Empirical Review**

Bassey, Effiok and Eton (2013), in their work whose objective is to examine the impact of environmental accounting and reporting on organizational performance of selected oil and gas companies in Niger Delta region of Nigeria, found that firms which are environmentally friendly will significantly publish environmental related information in their financial statements and other reports of the business. In a work aimed at evaluating the relationship between provision environmental accounting information and improving management performance of companies of pharmaceutical industry accepted in the Tehran stock exchange; Azar, Shahbazi, Abad & Moasavi (2014), concluded that a relationship exists between improving management performance and environmental accounting information disclosure of the companies accepted in Tehran stock exchange.

Mohammad, Sutrisno, Prihat and Rosidi (2013) also researched on effect of environmental performance and environmental information disclosure as mediation on company value. The researchers selected 59 companies in Indonesia, their major findings is that environmental accounting implementation has not been able to affect company value through environmental information disclosure. Also, another study was carried out by Lubomir and Dietrich (2009) captioned "Does better environmental performance affect revenues, costs or both? Evidence from transition economy. The work used unbalanced panel data of Czech firms from 1996-1998. The analytical results indicate strongly that better environmental performance improve profitability by driving down costs more than it drives down revenue.

In a study conducted by Norhasimah, Norhabibi, Nor, Sheh and Inaliah (2015) in Malaysia on the effects of environmental disclosure on financial performance, whose objective is to find out whether environmental disclosure practice exist among top 100 company of market capitalization in Malaysia for the year 2011, and its relationship with financial performance, the analysis shows mixed results between the existence of environmental disclosure practices in Malaysia and company financial performance.

The empirical review shows varying results on the relationship between environmental accounting and firm performance. Some show positive relationship, some negative and some mixed results. Most prior researches in the area were done on other countries and geographical locations outside Nigeria. None of them used the core environmental cost data used in this work against firm performance measure to evaluate performance. Most prior studies on environmental accounting disclosure or reporting in Nigeria have been exploratory and descriptive; focusing on discussing the environmental phenomenon. Some of the works that focused on oil and gas especially the one reviewed in this work concentrated on Niger Delta area of Nigeria and dwelt on reporting and not performance. Knowledge update is also required in terms of time scope. Based on the review, there are evidence of gap in Knowledge and literature, hence this study on manufacturing companies' performance in environmental accounting.

**Materials and Methods**

The study covers a period of ten years from 2008-2017 using only secondary data from ten (10) quoted manufacturing companies in Nigeria. The data for analysis were sourced from published financial reports of quoted manufacturing companies listed in the Nigerian Stock Exchange. Manufacturing companies are used in this study because the researcher was convinced of qualitative and quantitative information since it is believed that manufacturing companies are directly involve in environmental practices and its related issues. Moreover, majority of firms in this sector are indigenous and have long been involved in practice of environmental accounting. The statistical tool used for data analysis is multiple regressions. The study has multiple independent variables and a single dependent variable. The independent variables employed in the study are: Cost of Environmental Laws Compliance and Penalty, Donations and Charitable Contributions (DCC) and Cost of Environmental Remediation and Pollution Control which represents the environmental costs and one dependent variable; Return on Asset (ROA) as a measure of manufacturing companies' performance.

**Measurement of Variables and Specifications of the Models Used in the Study**

Using a single dependent variable return on assets (ROA) and three independent variables; Cost of Environmental Remediation and Pollution Control (ERPC), Cost of Environmental Laws Compliance and Penalty (ELCP), Donations and Charitable Contributions (DCC), a model was formulated thus; [ROA=f(ERPC+ELCP+DCC)].

In measuring these variables, the model uses a linear regression equation to test the hypothesis of the study.

$ROA = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+e$

Where:

ROA = Return on Asset $\beta_0$ = Intercept

$\beta_{1-3}$ = Coefficient of the independent variables

$X_1$ = ERPC (Represented by Total Cost of Environmental Remediation and Pollution Control)

$X_2$ = ELCP (Represented by Total Cost of Complying with Environmental Laws and non-Compliance Penalty)

$X_3$ = DCC (Represented by Total Donations and Charitable Contributions)

e = Residual or error term

**Results and Discussion of Findings**

Table 1 show that, during the time of the study the Environmental Remediation and Pollution Control, Environmental Laws Compliance and Penalty and Donations and Charitable Contributions have on average a mean score of 4.02, 3.81 and 3.20 respectively. Since the standard deviation of each of the variables are higher than the mean, indicating its low contribution to the Quoted manufacturing companies' performance model.

**Table 1: Sample Descriptive Statistics (2008-2017 Data)**

| Variable | Mean | Std.Dev | Tolerance | VIF |
|---|---|---|---|---|
| ERPC | 4.2014 | 6.82706 | 0.5233 | 1.430 |
| ELCP | 3.8133 | 8.35327 | 0.7468 | 1.275 |
| DCC | 3.2330 | 4.30522 | 0.6027 | 1.338 |

Source: *Researcher's Regression Result Exported from SPSS; 2021*

Multi-colinearity between the independent variables of the study are measured using two advanced measures; the tolerance value and the variance inflation factor (VIF). Looking at Table 1, the variance inflation factors were consistently below ten (10) showing a complete absence of multi-colinearity (Neter et al; 1996). This proves the appropriateness of the model of the study and it's fitting with the three independent variables. Moreover, the tolerance value for each of the variables are consistently smaller than 1.00 this further support the fact that multi-colinearity is completely absent between independent variables in the study (Tabachnick & Fidell, 1996).

**Table 2: Summary of Correlation**

| Variable | ROA | ELCP | DCC | ERPC |
|---|---|---|---|---|
| ROA | 1.000 | | | |
| ELCP | 0.74 | 1.000 | | 0.03 |
| DCC | 0.80 | 0.04 | 1.000 | 0.06 |
| ERPC | 0.84 | | | 1.000 |

Source: *Researcher's Regression Result Exported from SPSS; 2019*

The results in Table 2 show a positive relationship between Return on Asset and Environmental Law Compliance and Penalty, Donations and Charitable Contributions and Environmental Remediation and Pollution Control. The implication is that the variables representing environmental costs are contributing positively to the performance of Nigerian Quoted manufacturing companies in Niger Delta. However, the correlations between all the independent variables are not significant. The implication is that there is no co-linearity between the independent variables indicating the fitness of the model. The results of the regression analysis are shown in the table below.

**Table 3: Regression Analysis of Environmental Accounting and Performance of Quoted Manufacturing Companies**

| Environmental Cost | Performance | R | $R^2$ | Adj. $R^2$ | F. Significant |
|---|---|---|---|---|---|
| Variables | ROA | | | | |
| Intercept | 7.552 (0.000) | | | | |
| ELCP | 0.040 (2.718) | 0.93 | 0.90 | 0.88 | 0.004 |
| DCC | 0.001 (3.905) | | | | |
| ERPC | 0.005(2.817) | | | | |

Source: *Researcher's Result; 2021*

The relationship estimated for the model is shown thus: ROA = 7.552 + 2.718 (ELCP) + 3.905 (DCC) + 2.817 (ERPC)

The model shows that the three (3) variables representing environmental costs significantly affect Quoted oil companies' performance as measured by ROA. The results also indicate that, ERPC and DCC are all significant at 1.00% level of significance on performance, whereas ELCP is significant at 5.00% level of significance. These results implies that the more the Nigerian manufacturing companies spent money on handling, treatment and disposal of metal waste and emissions, remediation and compensation related to environmental damage; and any control related regulatory compliance costs, the better their performance.

Based on the analysis results therefore, the researcher rejects the hypothesis that environmental cost accounting has no significant effect on the performance of Nigerian Quoted manufacturing companies. Finally, the model summary of the regression results shows the combined effect of the environmental expenditure variables on the performance of Nigerian Quoted manufacturing Companies. The combined relationship between the independent and dependent variables of the study is ninety per cent (93%) which denotes strong positive relationship also statistically significant at 5% level. The $R^2$ which is the coefficient of determination is 0.93. This means that 93% of the performance of Nigerian quoted manufacturing companies is explained by environmental costs while the remaining 7% is explained by other factors.

The finding of this study is in line with the study of Azar et al (2014) which found a positive relationship between environmental accounting information and performance of the companies. It also agrees with the result of the study by Lubomir and Dietrich (2009) which established that a strong and better environmental performance improve profitability by driving down cost. However, the result of Mohammad et al (2015) showed a mixed result on the relationship between environmental disclosure practice and company performance. This neither agrees nor disagrees with the findings of this work. It is worthy of note that none of the previous works whose results are compared with the result of this research was carried out in the same country, locality, industry, or used exactly the same variables with the present research but they are all related on the issue of environmental cost accounting and company performance.

However, it was observed that most of the companies studied do not explicitly publish their environmental costs in the annual reports. Those that did published mainly their charitable donations. Although environmental cost information could be published in other forms of report by a company, such as press release, social reports, company websites, among others, it is better and more beneficial to publish the information in the corporate annual report to make it acceptable, more authentic and reliable. Publishing environmental cost information in the corporate annual financial reports of companies is therefore recommended by the researcher to enhance the practice of environmental cost accounting in the Nigerian manufacturing sector.



## Conclusion

Base on the findings of this study, spending on issues concerning the environment boost the performance of quoted manufacturing companies in Niger Delta Region. This therefore implies that those at the helm of affairs of manufacturing companies should increase their involvement in environmental activities for improved and sustainable performance.

## Recommendations

However, it was observed that most of the companies studied do not explicitly publish their environmental costs in the annual reports. Those that did published mainly their charitable donations. Although environmental cost information could be published in other forms of report by a company, such as press release, social reports, company websites, among others, it is better and more beneficial to publish the information in the corporate annual report to make it acceptable, more authentic and reliable. Publishing environmental cost information in the corporate annual financial reports of companies is therefore recommended by the the researcher to enhance the practice of environmental cost accounting in the Nigerian manufacturing companies.

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