Effect of environmental cost on firm performance: A Study of selected Manufacturing and Oil and Gas companies in Nigeria.

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ABSTRACT
This study examined the effects of environmental cost on firm performance of selected manufacturing and Oil and gas companies in Nigeria. This study was anchored on stakeholder theory with the aim to establish whether there is any significant relationship between environmental cost and performance of companies in Nigeria between 2010 - 2014. The data used, were obtained from the annual report of the selected firms. The study used descriptive statistics, correlation and regression analysis. The regression result shows that a positive significant relationship exists between corporate social responsibility, employee health and safety cost, waste management and firm performance while community development cost has a negative and insignificant relationship with firm performance. The study therefore recommends that firms should invest more in the development of their host communities to boast their corporate image and maintain good relationship with the host communities.

Keyword: Envrionmental Cost, Firm performance, Corporate Social responsibilty, Waste Management.

1.0 Introduction
The human drive for economic development and industrialization has no doubt impacted negatively on the eco-system which sustains the existence of man. The global awareness on the impact of man's activities on the environment was initiated by the London Club campaign captioned "limit to growth". This has led to increased public concern and scrutiny of the operations and performance of organizations. Since then, the focus changed from just economic development to sustainable economic development (development that meet the needs of the present generation without compromising the ability of the future generation to meet their own need).
The increase in global environmental awareness and campaign for sustainable economic development is redirecting the attention of companies towards environmental sensitivity. At National level, government regulation, society pressure groups and green consumer pressure has led to the awakening of firm to the reality that is no longer business as usual.
The uncontrolled impact of industrial activities on the natural environment has created critical ecological concerns (Maunders & Burritt, 1991; Burritt, Hahn & Schaltegger, 2002; Aragón-Correa & Sharma, 2003). The aggravation of phenomena like climate change, ozone depletion, and over-exploitation of natural resources, air pollution and toxic wastes are negatively affecting the sustainable development of the planet and of the economic system.
Accounting for the environment helps in accurate assessment of costs and benefits of environmental preservation measures of companies (Schaltegger & Burritt, 2000). It provides a common framework for organizations to identify and account for past, present and future environmental costs to support

managerial decision-making, control and public disclosure (KPMG, 2006). The severity of environmental problems as a global phenomenon has its adverse impact on the quality of our life. Measures are being taken both at the national and international level to reduce, prevent and mitigate its impact on social, economic and political spheres (GRI, 2002; GR1, 2006).

In Nigeria, the articulation of environmental concerns (costs and benefits) into financial reporting is still at a low stage. Companies do not provide clear cut sections for reporting issues in their annual reports. Environmental Information provided therein is usually scanty and trivial. Van and Werre (2003). Corporations globally are being asked to demonstrate the inclusion of environmental concerns in business operations and in interactions with stakeholders. Firms can no longer ignore the problems of the society in which they operate. This has thus instituted a social contract between organizations and the environment thereby making environmental responsibility a corporate dictate.

The movement towards environmental reporting has therefore become particularly apparent within both the developed and developing nations due to demands from stakeholders and other interested parties for information regarding corporate social environmental responsibility (Gray, Bebbington & Walters, 1993; Elkington, 1997and Guthrie, Suresh & Leanne, 2006). Therefore, this study examines the effects of environmental cost on profitability of selected manufacturing and oil and gas companies in Nigeria.

The environmental aspect of social responsibility has engendered considerable interest in recent years. However, while environmental performance and its consequent reporting has been main-streamed into business management in the developed world, such progress is less visible in Nigeria as in other countries in Africa (Adekoya & Ekpenyong, 2009). A conscious effort is required to make Nigerian firms more responsive to environmental responsibility issues. Regardless of the efforts made in the country since the 1992 Rio Conference to address environmental issues, environmental degradation has remained the greatest problems in Nigeria (Uwuigbe, 2011). Oil spills, emissions, pollutions, etc. have been the trademark of most firms' operating therein without recourse to alleviating the damaging effects of such discharges.

This could probably be due to the associated financial demand of such environmentally responsible actions. However, the environment is becoming a much more urgent social and economic problem. The accountant as the prime custodian of economic growth can no longer shut his eyes to the effect of environmental issues on accounting, business management, disclosure systems and ultimately bottom line (financial) effects. Accordingly, environmental reporting has been considered as an important issue to accountants. The goal of environmental reporting is, on one hand, to inform stakeholders of the environmental impacts an organization's activities have and of any initiatives that have been undertaken to mitigate the impacts (Gray et al, 1996) and on the other hand to maintain a socially responsible image (Lindblom, 1993). Assuming such reduction of stakeholder's information asymmetry and development of socially responsible image are attained through environmental reporting; the question then arises: Do these outcomes have a ripple effect on the bottom line? In other words, does environmental cost have effects on the performance of selected manufacturing and oil and gas companies in Nigeria? This study is thus poised to tackle this question.

The main objective of this study therefore is to examine the effects of environmental cost on performance of selected manufacturing and oil and gas companies in Nigeria.

The following research questions were formulated for this study.

1. Does environmental costs have any significant effect on performance of selected manufacturing and oil and gas companies in Nigeria?

The hypothesis for this study is:

Ho_1: Environmental cost does not have any significant effect on performance.

2.0 Literature Review

Beloff and Heller (1996), define environmental cost as costs incurred in order to comply with regulatory standards. Also, costs which have been incurred in order to reduce or eliminate releases of hazardous substances and all other costs associated with corporate practices aimed at reducing environmental impacts.

Companies have different view of what constitutes environmental cost. This may account for how they defines and treat environmental cost and how the information is to be utilized, for example: cost allocation, capital budgeting, process or product design or other management decisions. Accordingly, it may not be clear what costs are environmental or not as some may fall into gray areas. That means that some costs may be classified as partly environmental and partly non-environmental (GEMI 1994; Fagg et al 1993).

Environmental cost accounting is a term which refers to the addition of environmental cost information into existing cost accounting procedures and/or recognizing embedded environmental costs and allocating them to appropriate products or processes. Environmental accounting provides accurate information in the financial statements regarding the estimated social cost occasioned by the production externalities on the environment and how much deliberate intervention cost had been incurred to bridge the gap between the marginal social cost and the marginal private cost by a firm (Makori & Jagongo, 2013).Environmental accounting in the context of national income accounting refers to natural resource accounting. It provides statistics about a nation's or region's consumption of natural resources and takes into account the extent, quality and valuation of natural resources which are either renewable or non-renewable

The quality of management of a firm depends on how the business conducts itself toward the four main divisions of corporate social responsibility (CSR), work place-employee health and safety (EHS), Environment waste management (WM), community development (CD)

Theoretical Framework

This research work is anchored on Stakeholder theory. Several studies in developed and developing countries have justified the need for companies to disclose the impact of their activities on the environment using various theories such as stakeholder theory. The basic proposition of the stakeholder theory is that a firm's success is dependent upon the successful management of all the relationships that a firm has with its stakeholders. The stakeholder's theory in its instrumental approach suggests that enhancing the relationship with stakeholders and incorporating their concerns into corporate strategy might lead to improve the success of the corporation (Barney, 199). The theory according to Watts and Zimmerman (2008) assumes that disclosure on environmental information by an organization is as a result of the pressure from stakeholders such as communities, customers, employees and suppliers.

Carroll (1999) has defined stakeholders as any individual or group who can affect or is affected by the actions, decisions, policies, practices, or goal of the organization. Stakeholders can be identified by the legitimacy of their claims which is substantiated by a relationship of exchange between themselves and the organization, and hence stakeholders include stockholders, creditors, managers, employees, customers, suppliers, local communities and the general public.

The stakeholder theory believes that companies should be accountable for their stewardship over the resources entrusted to them by a coalition of these stakeholders (Chan, 1996). The stakeholder theory asserts that corporation's continued existence requires the support of the stakeholders and their approval must be sought and the activities of the corporation adjusted to gain that approval (Chan, 1996).

Stakeholder theory suggests organization will respond to the concerns and expectations of powerful stakeholders and some of the responses will be in the form of strategic disclosures Stakeholders theory provides rich insights into the factors that motivate managerial behavior in relation to the social and environmental disclosure practices of organizations. Previous social and environmental accounting research which utilized these theories indicate that organizations respond to the expectations of stakeholders and groups specifically and generally to those of the broader community in which they operate, through the provision of social and environmental information within annual reports. By utilizing stakeholder theory, we conclude that a firm's success is dependent upon the successful management of all the relationships that a company has with its stakeholders.

Empirical Review

Privious research has been contradictory on the relationship between environmental cost disclosure and profitability of quoted companies. For instance, Cohen and Konar (1997) examined the relationship between environmental performance and financial performance. The result showed that profitable firms are more environmentally responsible because they have superior financial performance. Similar result was reported by Russo and Fouts (1997), they also found a positive relation between firm performance, as measured by return on assets and environmental rating. In the same vein, Belkaouri (1976) examined the information content of pollution control disclosures. He found a positive performance between economic performance and environmental performance. Rockness, Schlachter and Rockness (1986) conducted a research on hazardous waste disposal in the chemical industry (environmental performance) and the return on equity as a measure of financial performance. In their study, they found positive relations; companies with higher financial performance are those who have smaller amounts of chemical waste disposal Bragdonand Marlin (1972) also produced a positive relation between profitability and environmental performance ratings for pulp and paper firms.

Makori and Jagongo (2013) investigated environmental accounting and firm profitability using selected firms listed in Bombay Stock Exchange, India. The objective of this study was to establish whether there is any significant relationship between environmental accounting and profitability of selected firms listed in India. The data for the study were collected from annual reports and accounts of 14 randomly selected quoted companies in Bombay Stock Exchange in India. The data were analyzed using multiple regression models. The key findings of the study showed that there was significant negative relationship between Environmental Accounting and Return on Capital Employed (ROCE) and Earnings per Share (EPS) and a significant positive relationship between Environmental Accounting and Net Profit Margin and Dividend per Share.

Roberts (1992) has found a positive relationship between profitability and corporate social and environmental responsibility. However, Patten (1992) fails to find any significant positive relationship between profitability and corporate social and environmental disclosure.

Mackinlay (1997) finds no strong relationship between economic performance and corporate social and environmental investment. Meanwhile, Ngwakwe (2009) in his study of sixty Nigerian manufacturing firms observed that investment in social and environmental responsibilities are related to improved return on total assets.

In Nigeria, large portions of the literature are based on the extent or level of environmental disclosures (Uwuigbe & Jimoh, 2012; Appah, 2011; Owolabi, 2008). Collins, (2009) examined environmental responsibility and firm performance. In his study of sixty Nigerian manufacturing firms observed that investment in social and environmental responsibility is related to improved return on total assets. In line with this, Oba et al, (2012) investigated the value relevance of environmental responsibility information disclosure in Nigeria. The study examined the association between environmental responsibility information disclosure and financial performance (Return on capital employed). It found a positive relationship.

Duke and Kankpang (2013) examined the implications of corporate social responsibility on performance of Nigerian firms using ROCE to measure performance and relationship was positive.

Akinlo and Iredele (2014) examined corporate environmental disclosures and market value of quoted companies in Nigeria for the period 2003 to 2011. The aggregate and individual impacts of Corporate Environmental Disclosure were regressed on Market Value while Firm size was factored in as an extraneous variable. The result of the descriptive analysis showed that the mean and median values are within the minimum values and the standard deviation is low which indicated that the deviation of the actual data from their mean value is very low. The empirical analysis revealed that corporate environmental disclosure has a significant positive impact on Market Value when considered in aggregate. In turn, considering the impact of each of the variables, Energy policy, Impact on Biodiversity, Awards Received for installing Environmental Management System have an insignificant positive impact on Market Value with the exception of Environmental Research and Development cost. Also, Environmental pollution and control policy, Waste Management Cost, and Cost of compliance with environmental Laws have a negative impact on Market Value.

3.0 Research Method

This study adopted ex-post-facto research design. The pooled data collected where analyzed using, descriptive statistics, correlations and regression analysis. The study used twenty quoted manufacturing and oil and gas firms in Nigerian and covers the period of 5years (2010-2014).

The environmental cost can be broken down into: cost on corporate social responsibility, employee health and safety, waste management, and cost on community development.

Model One

This model measures the effects of environmental cost disclosure on firm profitability. The functional form of the model is given below. Y = f(X)

The linear regression model is stated in a functional form as;

Profit = *f* (CSR, EHS, WM, CD) - - - - - - - - 1

Where

Profit = Net profit.

CSR = Corporate Social Responsibility

EHS = Employee Health and Safety

WM = Waste Management Cost

CD = Environmental Cost Disclosure.

This equation can be restated in an econometric form as:

$Profit_{it} = \beta_0 + \beta_1 CSR_{it} + EHS_{it} + \beta_3\ WM_{it} + \beta_4\ CD_{it} + \mu$ - - - - - 2

Where

β_0 = constant intercept

μ = Stochastic variable or error term

β_1, β_2, β_3 and β_4 Coefficient of parameter

4.0 Data Presentation and Analysis

This study investigated firm performance and its interaction with cost of corporate social responsibility (CSR), Employee health and safety cost (EHS), Waste management (WM) and Community development programme (CDP). The study used pooled data collected from twenty selected quoted companies' data. The study used descriptive statistics correction and multiple regression analysis in obtaining a function relationship between environmental cost and firm performance.

Table 4.1 shows the descriptive statistics

Variable	Mean	Median	Maximum	Minimum	Std Dev	JB(P-Value)
Profit	6.8871	6.5994	10.4912	1.5966	4.6777	0.003
CSR	3.479	3.4508	5.6580	1.0349	2.9650	0.017
EHS	1.6358	1.5423	2.4259	0.9970	1.2576	0.087
WM	0.9205	0.9113	2.1053	0.3968	1.1168	0.056
CD	0.9227	0.8812	1.6907	0.1439	0.9848	0.034
NO	60	60	60	60	60	60

SOURCE: Jeff (2016) Summary of descriptive statistics

Table 1, shows the mean (average) for each of the variable, their standard deviation and Jarque Bera (JB) statistics (Normality test). The result provided insight into the nature of the data from selected firm that was used in this study. Firstly, it was observed that over the period under study the sampled companies' profit (log-value) has a median, maximum and minimum value of 6.5994, 10.4912 and 1.5966 respectively, the large difference between median and minimum shows that the sampled quoted companies in this study were not dominated by either large or small companies.

Correlation analysis. Secondly, it was observed that on the average over the period, the sampled companies incurred 3.2091(log base 10 value), their maximum and minimum amount spent for corporate social responsibility are 5.6580 and 1.0349. This shows that some firms spend much on CSR while others don't.

Lastly, in table 4.1, the JB which tests for normality and the existence of outlier or extreme value among the variables shows that all the variables are normally distributed at 1%(*), 5(**) and 10%(***) level of significance. Profit and CSR are significance at 1%, waste management and community development were significant at 5% while employee's health and safety was significant at 10%. This means there is no variable with outlier that may likely distort our conclusion; therefore, the result is reliable for drawing generalization. This also implies that a least square estimation can be used to estimate the pool regression models.

Correlation Analysis

In examining the association among the variables, the study employed the Pearson correlation coefficient (correlation matrix) and the result are presented in table 4.2 below.

Table 4.2 Correlation Matrix

Variables	Profit	CRS	EHS	WM	CD
Profit	1.000				
CRS	0.3511	1.000			
EHS	0.0799	0.2509	1.000		
WM	0.1128	0.1446	0.4795	1.000	
CD	0.1089	0.1059	0.3645	0.3547	1.000

Source: Jeff (2016) extract from minitab16 correlation analysis.

The study used the correlation analysis to check for the presence of multicolinearity and explore the association that exists all in the variables used for the study. Firstly, it was observed that there was a positive association between profit and CRS, EHS, WM and CD. All the variables have a positive association, this suggests that all the individual explanatory variables have influence on the performance (profit) of the companies. Though the influence of employees' health and safety on profit in weak, it is positive. In checking for multicolearity, the study observed that no two explanatory variables were perfectly associated. This means that there is absence of multicolearity in the model used.

Regression Analysis

The study used multiple regression to test the effect of the independent variable on the dependent variable. Below is the result of the regression.

Table 4.3 Multiple Regression Analysis result

	CRS	EHS	WM	CD
Coefficient	26.8617	16.1206	11.0376	11.1344
T-test	6.3428	4.5352	2.6660	2.2580
P-value	0.0160	0.0670	0.0140	0.2357

R-sq(Adj)	0.5717
F-statistic	49.6842
F-statistic	0.0703
Durbin Watson	1.7691

Source: Jeff (2016) summary of regression analysis.

In the regression table above, the study observed that R-Sq(adj) 0.5717 (57%), this indicates that all the explanatory variables jointly explain about 57% variation in the dependent variable. This means that 57% of changes in manufacturing and oil and gas can be attributable to the cost incurred on CSR. The F-statistics probability value of 0.0703 shows that the regression model is generally significant and well specified at 10% significant level. The Durbin Watson of 1.7961, approximated to 2, this confirm the absence of multicolinearity.

Hypothesis 1

The regression analysis of the effect of CSR on profit showed a coefficient value of 26.8617 and P-value of 0.0160. The coefficient value (26.8617) means that CSR has a positive effect on profit and the effect is statistically significant at 10% level. The analysis revealed that EHS, WM and CD have a coefficient value of 16.1206, 11.0376 and 11.1344 respectively, these value means EHS and WM cost positively affect companies profit and the effect was statistically significant at 10% (EHS) and 1% (WM). While the CD has a positive effect on profit, the effect is not statistically significant.

The analysis result reveals that firms in Nigeria incurred more cost on the firm related environmental issues than environmental issues that will least benefit the firm. Firm's environmental related issues have direct effect on the operation of the firm e.g Employee health and safety, Waste management while the non-firm environmental issue like community development directly benefits the host community and does not affect the operation of the organization. It only helps the firm build good image.

5.0 Conclusion

This study examined the effects of environmental cost on firm performance of selected manufacturing and oil and gas in Nigeria. Data were obtained from the annual accounts of the selected firms. The regression result shows a negative and insignificant relationship between environmental cost and firm performance of the selected companies.

Environmental costs cover all cost incurred concerning environmental protection such as emissions treatment as well as wasted material, capital and labour which so called 'non product output' as a result of inefficiency production activities. Different firms may consider different elements into environmental costs but it is important that all significant and relevant costs are incorporated for sound decision making purpose.

Recommendations

Based on the findings of this study the following recommendations are made:

1. Firms should invest more in the development of their host community to boast their corporate image and maintain good relationship between firm and the host community.
2. Environmental cost reporting in annual reports should be made compulsory, since most organizations hardly report their environmental activities in their report.
3. Government agencies should give tax credit to organizations that comply with its environmental laws of the land which will encourage environmental reporting.
4. Companies on their part should ensure that they comply with the environmental laws of the nation as this will go a long way in enhancing their performances.

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