

Environmental Remediation Costs and Earnings of Oil and Gas Firms in Nigeria

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Abstract

This study investigated the effect of environmental accounting on the financial performance of selected oil and gas companies in Nigeria. The study specifically examined the effect of environmental remediation and cost of pollution control on Earning per Share (EPS) of oil and gas firms in Nigeria. A sample of three firms was selected out of a population of eleven oil and gas firms listed on the Nigeria Stock Exchange during the period. Secondary data were collected from the selected firms and analyzed using Multiple Regression analysis. Findings from the analysis suggest that The F-Statistic was 5.894468 at 0.03897 significance level with $df (10, 2) = 3.49$. The t-calculated of ERC is 1.032319 which indicates that ERC has a positive and significant effect on Earnings per share of oil and gas firms in Nigeria also the t-calculated of CPC is -3.106134 and probability value of 0.0077 which indicates that CPC has a negative and significant effect on earnings per share of oil and gas firms in Nigeria. Based on the findings the study recommends that management of the companies should channel effort on engaging in adequate spending on the environment and its revelations as way of increasing stakeholders confidence and showing more transparency in their operations.

Keywords: *Environmental cost, Pollution control cost, Remediation cost, Earning per share.*

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I. Introduction

The continuous emission of greenhouse gases and use of natural resources by factories around the universe are on the increase. This could be traced to industrial revolution of late 18th century where economic activities in many countries moved from agriculture to manufacturing. The industrial revolutions led to economic enhancement for many people in the industrialized environment. However, the success of every corporate organization depends on its operational environment as no business can survive without the environment. The role of the environment and its proven enormous contribution to the continued success of corporate organizations, have necessitated the concept of environmental accounting as part of corporate accounting system. Amedu, Iliemena and Umaigba (2019) posit that most Nigerian manufacturing companies are silent on environmental information disclosure. Furthermore, the use of natural resources and continuous emissions of greenhouse gases by industries around the universe are on the increase. Manufacturing moved from its traditional locations in the houses and make-shift workshops to factories. These economic developments have some associated environmental costs. Industrial development which requires the use of natural resources brought about firms pollutant and massive land use, which damaged the normal environment (Mastrandrea and Schneider, 2008). Yakhon and Dorweiler (2004) are of the opinion that the impact of business activities on the environment is found in many types such as air, water, below the soil contamination, drinking water, land and habitat for endangered and threatened species, oceans and land pollution. Environmental accounting policies or environmental disclosure guidelines, for communication to different stakeholder are not available for Nigerian companies; however, there have been some efforts on the part of government towards enacting Acts and laws to enhance environmental sustainability in Nigeria. These include Environmental Impact Assessment Act 2004, Environmental Guidelines and Standards for petroleum industry 2002, National Environmental Standards and Regulations Enforcement Agency Act 2004.

Recently, there has been an increased awareness of the interaction between firms and environment in which they operate, this enlightenment has been increased by concerns about assets depletion, paucity, environmental degradation and activities of these firms that lead to the reduction of ozone layer and thereby causing an alteration in the ecosystem. The rise in menace about environmental degradation, resource depletion and inability to sustain economic activities have made the development of environmental cost an area of

significant interest in Nigeria. The success or failure of a company may be determined not only by the products and services it deals with but also by the complexity of its environment.

Revenue from oil and gas sector is the main source of foreign exchange in Nigeria. The country's yearly budget is based on the estimated price of oil per barrel on the world market. There is a relationship between these firms and the environment in which they operate. This led to world environmental enlightenment and campaign for continue economic growth and firms focusing on environmental friendliness.

Environmental protection agency based in USA posits that environmental costs include costs of abiding with environmental rules and regulations. It also includes environmental remediation costs, cost of pollution control equipment and penalty for non-compliance. Environmental costs is the amount incurred to reduce degradation, cost of bringing the environment to its natural state, cost of restoring depleted environment to its original composition. Net profit requires the subtraction of recurrent expenditure from total income (Okafor 2018). Sometimes, the amount that leads to alteration of the environment, which negatively affect people and destroys the environment are not considered before profit is ascertained. This invariably results in reporting of false and abnormal profit which also will deceive the users of the financial statements. So, it is imperative for financial statements which provide full detailed firms activities and stakeholders value creation, combining economic, social and environmental factors into companies ideology with the objective of increasing creation of more yields: hence the need for this research on the effect of environmental cost on the corporate performance of selected oil and gas companies in Nigeria.

The main aim of this research work is to investigate the effect of environmental remediation cost on the earnings of selected oil and gas companies in Nigeria. To achieve this, two specific objectives are stated below:

1. To determine the effect on environmental remediation cost on Earning per Share (EPS) of oil and gas companies in Nigeria.
2. To examine the effect of cost of pollution control on EPS of oil and gas firms in Nigeria

II. Review Of Related Literature

2.1 Concept of Environmental Cost

Environmental costs are costs connected with the actual or potential deterioration of natural assets due to economic activities. According to UNEP (2006), environmental costs is a system that provides a common framework for organizations to identify and account for the past, present and future environmental costs to support managerial decision making, control and public disclosure. It has been referred in a variety of ways in different literature: environmental management accounting, corporate social accounts, social accounting, social and environmental accounting (Cooper, Taylor, Smith, & Peterson, 2005). These however, have not changed the meaning as all drive towards quantifying environmental expenditure. The practice of environmental cost helps an organization to quantify the impact of its activities on the host community. This does not involve only the expenses incurred but also the costs benefits generated in an accounting period. Environmental costs information include information regarding the treatment of chemicals generated in a production process, labour cost (embedded in salaries and wages), disposal costs, fine and penalty costs or savings, regulatory fees, maintenance cost, cost savings in upgrading to more environmentally friendly methodologies, material costs etc. The manners in which firms apply environmental costs dissent depending on activities engaged in the period and the management decisions on what should part of cost information.

2.1.1 Environmental Costs in Nigeria

Manufacturing operations in the environment have led to material reduction and loss in the quality of the environment. All these actions also resulted to the negative tempering of ozone layer, resulting to disequilibrium in the ecosystem (Adediran and Atu 2010).The outcome of producing and consuming goods should be disclosed in the accounts of firms. There are several statues that regulate financial reporting of firms quoted in the Nigeria Exchange Group (NGX). They include:-

1. Companies and Allied Matters Act (CAMA) 1990 as amended to date
2. Nigeria Accounting Standard Board (NASB), now Financial Reporting Council of Nigeria (FRCN)
3. Investment and Security Act 1999
4. Bank and other Financial Institutions Act (BOFIA) 1991
5. The Insurance Act 1997
6. Security and Exchange Commission Law.

None of these professional bodies, controlling agencies have made the disclosure of firms' activities on the environment compulsory. Nigerian government is making a serious effort to increase environmental disclosure by organization by promulgation of many environmental laws via the Ministry of Environment and Natural Resources. The objectives of these laws include;

1. To introduce penalty on the emission of poisonous chemicals into the environment.
2. Establishing standards which organizations and equipment that produce waste must meet.

3. Companies should organize plans for managing abnormal and emergency emission and effort put in place to reduce waste.
4. Mandating firms to fix equipment capable of decreasing or stopping pollution that result from manufacturing operations.
5. Placing higher limits of effluent parameter permitted to be thrown into the environment.

2.1.2 Cost of Environmental Remediation and Pollution Control

The process of salvaging the environment from the harmful effect of oil spills is termed remediation. Environmental remediation is viewed as elimination of pollutants from environmental media such as soil, groundwater, sediment or surface water. Several methods are used in correcting polluted areas. These include identifying the challenges, weighing the cause and extent of the pollution disaster and the best way to remedy the situation. The importance of remediation has resulted to the emergences and innovation of technologies that place emphasis on purification and elimination of the pollutants instead of orthodox way of disposal (Wang 2014).

Uchegbu (2012) posits that remediation whether by biological, chemical or both are the solution as the issue of pollution needs to be solved without relocating to the future. Bioremediation interest in the degradation of pollutants has increased recently as people tries to find solution to polluted environment. Bioremediation of soils or environment may be increased by fertilizing (putting elements such as carbon, nitrogen and phosphorus) and/or seeding with appropriate microbial population (Dadasnia and Agamuthe, 2014).

Restoration of a damaged environment is clearly an extension of cleanup and requires positive steps to encourage natural recovery, especially in some specific instances where such recovery would otherwise be relatively slow. The cost associated with air, water pollution and land and ecosystem degradation and destruction have been or will be borne by society. In other words, it is in line with Polluters Pay Principle (PPP).

2.1.3 Measuring Corporate Performance

Corporate performance can defined as measure of financial capability of a company at any given period of time. It can be measured in terms of net profit and loss or asset utilization. According to Iliemena and Okolocha (2019), the level of corporate performance of a firm varies with the aim of its measurement. Corporate performance of firms is determined based on way they render account of services to the stakeholders. It could be in form of profit and loss, fair value and growth of an organization. The determination of the impact of environmental cost on performance reviews the link between some indicators of environmental cost and the firm's financial records obtained from the annual reports of the respective companies. Corporate performance can be defined or measured in various ways including profitability, turnover, gauge return, market share growth, return on investment, return on equity, return on capital employed and liquidity indices. In this study, corporate performance is measured by Earnings Per Share (EPS).

Earnings Per Share is the monetary value of earnings per outstanding share of common stock for a company. EPS is one measure that can serve as a proxy of a company's financial health. If all of a company's profits were paid out to its shareholders, EPS is the portion of a company's net income that would be allocated to each outstanding share. EPS is typically used by economic analysts and investors to ascertain the financial strength of a company. It is often considered to be one of the most important variables in determining a stock's value. It is sometimes known as the bottom-line (the final statement), both literally and figuratively of a firm's worth. A higher EPS means a company is profitable enough to payout more money to its shareholders. For example, a company might increase its dividend as earnings per share increases over time.

$$\text{EPS} = \frac{\text{Net income} - \text{Preferred dividend}}{\text{Average outstanding common shares}}$$

However, not all companies have preferred stock. Some offer only common shares. Then the formular would simply be:

$$\text{EPS} = \frac{\text{Net income}}{\text{Average outstanding common share}}$$

2.2 Theoretical Framework

The study is anchored on stakeholders theory which emphasizes the importance of recognizing various stakeholders that are necessary for the successful operation of a business. The theory is of the view that capitalism shows the interconnectivity relationship between a business and its customers, creditors, staff, investors, environment in which the organization operates and others who invested in the company. It argues that a firm should create value for all stakeholders not just shareholders. Organization environment composes of

surroundings of an organization that affect performance, operations and resources. The environment is the source of resources that organizations need. It provides opportunities and threats and also influences the vital decisions that the management must take to move firms to a greater height. From environment, people derive minerals, energy, food and other natural resources for use in economic activity, thus depleting these resources or degrading the biological systems on which their continued production depends potent danger to the entire universe (Elijah 2017).

Many researchers have conducted different research works on environmental accounting globally as efforts are being made to promote environmental consciousness among corporations.

In Nigerian scene, Iliemena (2020) studied the effect of environmental accounting on corporate performance of listed oil and gas companies in Nigeria, 2012- 2018. The work formulated hypotheses which were tested using data obtained from stock exchange fact books, corporate sustainability reports and annual reports of sample firms. Ex-post facto research design was employed in the study and the analysis carried out using simple linear regression. Findings reveal that environmental accounting practices and accounting have significant positive effects on both turnover and Return on capital employed; while effect on net profit even though positive, was insignificant. The theoretical outcome of the study is the Performance Improvement Theory (PIT) which states that firms are involved in sustainability accounting generally for the reason of improved corporate performance benefit derivable through good reputation and cost reduction. The study concluded that environmental accounting has significant positive effect on corporate performance of practicing companies. It is recommended among others that corporate organizations should extend their management accounting as a way of ensuring long-run corporate sustainability.

Amedu, Iliemena and Umaigba investigated value relevance of sustainability reporting among manufacturing firms in Nigeria. The study adopted a longitudinal research design. The sample comprised of thirty companies randomly selected from firms quoted in Nigeria Exchange Group. The hypotheses were validated using panel data regression technique. The results revealed that economic- sustainability and social sustainability reporting of quoted manufacturing firms were value relevant. The study recommends that companies should devote more attention to sustainability reporting. In addition, regulatory bodies such as the Securities and Exchange Commission (SEC) and the Nigeria Exchange Group should look into making sustainability reporting a necessary requirement for firms to be listed.

Okafor (2018) carried out a research on the environmental cost accounting and reporting on firms' financial performance: a survey of Nigerian quoted oil companies. The study made use of Annual reports of oil and gas companies listed on the Nigerian Exchange Group for a period of ten years. Regression analysis was employed in analysis of the study. The outcome of the analysis shows that better environmental performance has positive effect on business value of a firm. Furthermore, environmental accounting avail the companies an opportunity to reduce environmental and social costs and improve their financial base.

In Pakistan, Ahmad, Waseer, Hussain and Ammara (2018) reviewed the relationship between environmental accounting and non-financial firms' performance listed in Pakistan stock exchange. The study used regression analysis technique, using companies annual data from 2006-2016. The empirical analysis showed a significant and positive relationship between environmental accounting and firm's size. While earning per share and return on capital employed statistically turned out to be insignificant.

Ahmad, Simon and Mohammed (2017) reviewed the impact of environmental disclosure on performance of cement and breweries companies in Nigeria. The population of the study consists of nine cement and five breweries firms listed on the Nigeria Exchange Group (NGX). Secondary data were collected from annual reports of selected companies for the period of five years from 2011-2015. Ordinary Least Square (OLS) regression technique was employed to analyze the data. Return on Asset (ROA), Return on Equity (ROE) and Earning per Share (EPS) were used as proxies for measuring performance. The empirical result indicates that Environmental Disclosure Quantitative (EDQN) has positive insignificant effect on ROA and EPS at 0.707 and 0.616 respectively. It has negative insignificant effect on ROE at 0.756. On the other hand, Environmental Disclosure Qualitative (EDQL) has positive significant impact on ROA at 0.025 and also with EPS at 0.00. It however has positive insignificant impact on ROA at 0.660 and is statistically significant. The study recommends that cement and breweries companies should practice how to disclose more environmental information.

Shahariar and Zubair (2019) examined the impact of environmental reporting on the financial performance of fortune 500 firms from 2013-2017. It appraises financial performance by measuring three independent variables; reduction in greenhouse gas emissions, reduction in waste and reduction in water consumption. The collected data were analyzed using descriptive statistics, correlation and regression analysis. Findings indicate that reduction in nominated variables such as greenhouse gas emission and water consumption have a positive and significant impact on financial performance. The study recommends that firms should adopt environment friendly resources to attract shareholders as well as save the planet.

Arma (2018) conducted research on the effects of Earning per Share and firm size to stock price LQ45 companies listed in Indonesian Securities. The purpose of the study is also to prove that the size of the firm can moderate the relationship between EPS and stock price. By conducting regression analysis, the study gives evidence that EPS and firm size have a significant effect on stock prices. The size of the firm is also able to moderate the relationship between EPS and stock prices. The result gave evidence that profit and size of the company can provide important information for investors for making decisions.

Denila, Dwi, Afista, Arfi and Fitri (2020) studied the influence of Earning per Share (EPS) and Price Earning Ratio (PER) on stock return in mining sector companies listed on the Indonesia Stock Exchange (ISA) from 2016 to 2018. The independent variables were EPS and PER, stock return was the dependent variable. Descriptive and verification methods were used as the research methods. The population of the study was forty one companies while the sample size was twenty one firms. The data were analyzed using panel data regression analysis and Eviews 9. The findings reveal that EPS and PER affect stock return. Furthermore, the magnitude of the effect of EPS and PER on stock returns is 57.0%.

III. Methodology

The work is an *ex post facto* research which means that it renders panacea to research problems, by using data which have been in existence. Secondary data were collected from the published annual financial statement of the selected listed oil and gas firms for the study for the period of 2011 – 2020. The population of the study comprised the entire eleven (11) oil and gas firms were listed on the Nigeria Stock Exchange during the period. A sample of three (3) oil and gas firms were randomly selected from the population of eleven (11) oil and gas firms listed on NGX during the period.

The following model was developed based on the variables of the study:

$$CSRC = \beta_0 + (\beta_1 TOA + \beta_2 TOS + \beta_3 FNL + \beta_4 FIA) + \varepsilon$$

Where:

ERC = Environmental remediation cost

CPC = Cost of pollution control

EPS = Earnings per share

β =beta

ε = error term

IV. Discussion Of Findings

4.1. Data Analysis

Table 4.1 Descriptive Result

	EPS	ERC	CPC
Mean	116.9490	23922621	0.277500
Median	124.3500	18385395	0.200000
Maximum	167.9000	62240317	0.760000
Minimum	40.85000	-2615886.	0.080000
Std. Dev.	36.94234	17110096	0.216719
Skewness	-0.807834	0.897892	1.238138
Kurtosis	2.691024	3.218242	3.265259
Jarque-Bera	2.254876	2.727058	5.168585
Probability	0.323862	0.255757	0.075449
Sum	2338.980	4.78E+08	5.550000
Sum Sq. Dev.	25930.00	5.56E+15	0.892375
Observations	30	30	30

The descriptive statistics in 4.1 shows that the mean value of the variables are, 116.9490, 23922621 and 0.277500 respectively for Earning per share, environmental remediation cost and cost of pollution control. Also the standard deviations of the variables are 36.94234, 17110096 and 0.216719. This indicates high volatility for the dependent and independent variables were found to be moderate. The Jarque-Bera Statistics indicates that the data distribution is normally distributed judging from the level of significance which are all

significant at 0.05 level of significance. This result was also corroborated by the Skewness and the Kurtosis tests.

Result of table 4.1 shows that the estimated coefficient for EPS is positive for ERC indicating that there a positive and significant effect of environmental remediation cost on EPS while there a negative and significant effect of environmental remediation cost on Earnings per share. The result is in order with economic theory. The result is also statistical significant at 5per cent level of significance.

These indicate that a one naira change in environmental remediation cost will increase the Earnings per share.

The Durbin-Watson statistics is 1.407064 which is sustainably below 2. In this case, the Durbin Watson statistics is also close to 2 than 0 which indicates the presence of auto correlation in the series. The result indicates the absence of positive serial correlation in the time series data extracted from the annual report and accounts of the firms.

Table showed that R Square, Coefficient of determination, i.e., the squared value of the multiple regression coefficient value to be 0.6177956; meaning that, approximately 62% of the variance in the dependent variable was explained by the model of ERC and CPC (In simple term, it shows that 62% changes in the dependent variable Earnings per share is caused by changes in the independent variables. It therefore means that the remaining 38% is caused by other variables not found in the equation but indicated by the error term. The adjusted R^2 value of 0.562940 means that the model is about 56% goodness fit.

The F-Statistic was 5.894468 at 0.03897 significance level with $df(10, 2) = 3.49$. The t-calculated of ERC is 1.032319 which indicates that ERC has a positive and significant effect on Earnings per share of oil and gas firms in Nigeria also the t-calculated of CPC is -3.106134 and probability value of 0.0077 which indicates that CPC has a negative and significant effect on earnings per share of oil and gas firms in Nigeria.

4.2 Discussion of findings

Result of hypothesis one shows that cost of environmental remediation has positive (+) and significant effect on Earning per share of oil and gas firms in Nigeria. This is in agreement with the studies of Iliemena (2020) on the effect of environmental accounting on corporate performance of listed oil and gas companies in Nigeria, 2012- 2018, its also in agreement with studies of Ahmad, Waseer, Hussain and Ammara (2018) on the relationship between environmental accounting and non-financial firms' performance listed in Pakistan stock exchange.

Result of hypothesis two revealed that there is a (-) negative and significant relationship between cost pollution control and EPS of oil and gas firms in Nigeria. This is in line with the studies of Ahmad, Simon and Mohammed (2017) on the impact of environmental disclosure on performance of cement and breweries companies in Nigeria, it is also in consonant with the studies of Shahariar and Zubair (2019) on the impact of environmental reporting on the financial performance of fortune 500 firms from 2013-2017.

V. Conclusion and Recommendation

As earlier mentioned, this study investigated the effect of environmental cost on the financial performance of selected oil and gas companies in Nigeria. Financial performance of firms does not depend on the expenditures made towards the environment in which they operate. However, when sufficient spending is made towards protecting the environment, trust and transparency would be seen to have taken place by the stakeholders, conducive operating environment could be created and hence better Profitability attained by the companies.

In view of the finding of the study, it is concluded as follows: Environmental cost does not have any significant relationship with Earning per share (EPS) of oil and gas companies in terms of their Net Profit. In line with the findings the following recommendation is put forward for consideration by the appropriate authorities:

In view of the insignificant relationship that exists between environmental cost and financial performance of oil and gas companies, the management of the companies should channel effort on investing in sufficient environmental expenditure and its' reporting as way of improving stakeholders confidence and also be more transparent in their activities. This could in turn lead to achieving better financial performance. Furthermore, functional and interactive environmental accounting units should be created by each oil and company to ensure that they maintain their guidelines in reporting environmental issues in their annual reports and accounts. This would enable their stakeholders and potential investors access these information and invariably enhance the financial rating of the firms.

Limitation of Study

This study is limited to three oil and gas companies listed on the Nigeria Stock Exchange. This was due to unavailability of adequate data in respect of other oil and gas companies operating in Nigeria. Future research could evaluate other oil and gas firms as soon as adequate relevant data are available. Also, future researchers could extend the number of years considered.

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APPENDIX I

Raw Data obtained from Eterna Oil Plc, Mrs Oil Plc and Oando Oil Plc.

Firms	YEAR	EPS	ERC	CPC
Eterna Oil Plc	2011	49.00	18842856	111748297
	2012	40.85	25700593	145461762
	2013	52.02	30332118	164207848
	2014	77.10	27910091	185862785
	2015	94.42	38434033	207303379
	2016	147.00	38042714	252674213
	2017	167.90	62240317	268613518
	2018	165.3	61461821	266372475
	2019	136.00	38049518	293905792
	2020	147.99	28396777	313743147

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Mrs Oil Plc	2011	125.4	10691060	62265413
	2012	144.3	11860880	69172885
	2013	123.1	13541189	89172852
	2014	140.1	13736359	109366975
	2015	133.9	17927934	123663125
	2016	129.5	14671195	126288184
	2017	122.1	11863727	122463538
	2018	114.4	9570223	109202120
	2019	123.3	7794899	118495882
	2020	105.3	(2615886)	101973030
Oando Oil Plc	2011	1.113943	6.653564	0.93227
	2012	1.462398	6.700685	0.90617
	2013	1.491362	6.707615	0.89996
	2014	1.322219	6.851469	1.17711
	2015	6.304603	6.855455	1.123
	2016	6.21176	6.96544	1.56822
	2017	1.623249	6.98763	1.04771
	2018	1.69897	6.914383	0.99112
	2019	1.322219	6.416756	0.76958
	2020	1.851258	6.823874	0.98794

Source: Author's Compilation from firm's annual and account

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