Environmental Management Cost And Financial Performance Of Oil And Gas Companies In Nigeria

Precious Ozunem Nwanwu, Ph.D

Department of Accounting,
Faculty of Management Sciences,
Ignatius Ajuru University of Education,
Rumuolumeni, Port Harcourt, Nigeria
pozunem@gmail.com
2348034633420

ABSTRACT
Oil and gas companies whose activities impact negatively on the environment are faced with huge cost in order to remedy the environment. This study therefore investigated the effect of environmental management costs on financial performance of quoted oil and gas companies in Nigeria for the period of 2011-2018. Pollution cost served as dimension of environmental management cost and net profit as measure of financial performance. Positivism and interpretive Philosophy was adopted while explanatory and correlational research design were adopted for the study. The population of the study was 10 quoted oil and gas companies listed in Nigerian Exchange. Data was sourced from annual reports and accounts of the companies available at Nigerian Exchange website. Descriptive statistics regression analysis and correlations coefficient guided by a regression model were used for data analysis and testing of hypotheses. The result of the study showed that pollution cost, has a positive and significant effect on financial performance of quoted oil and gas companies in Nigeria. It is concluded that environmental management cost has a significant effect on performance of Oil and Gas Company in Nigeria. The study recommended among others that management of oil and gas companies should increase their environmental expend if possible so that they would have zero environmental impact as proposed by cost reduction model. This can be done by engaging in more of remediation activities, so that stakeholders trust could be enhanced.

Keywords: Environmental Management cost, Financial Performance, Net Profit, Oil and Gas companies, Pollution cost,

1. INTRODUCTION
The importance of environmental cost and how to manage it has become of utmost concern globally especially as it relates to oil and gas companies in contemporary times. It has become one of the foremost issues on the agenda of nations and businesses earlier in the 1990s and the reasons for this were varied; emanating from both within and outside of the firm and particularly at the global level (Okoye & Ngwakwe, 2013). To champion this further, a lot of government enactments, laws and regulations on environmental protection have been made in several nations of the world, including Nigeria to see how these issues can be tackled (Arong et al., 2014). For instance, the United States of America, Canada, Norway, the United Kingdom and the Netherlands have led in the pursuit of degradation and pollution prevention, control and the need for environmental safety (Nagle, 2012; Arong et al., 2014). There is no completeness and correctness of fair view to users of financial information, such as shareholders, environmental regulatory agencies, environmentalists and potential financial investors. For example, degradation or other negative impact on the environment could affect output level and corporate financial
statement such as create actual or contingent liabilities and may have adverse impact on asset values. Consequential effect on corporate organizations may result in incurring future capital expenditure and cash flows which may impinge on going concern as balance sheet secured loans may not be secured after all it land values for instance are affected by environmental factors (Arong et al., 2014). Hassan (2017) documented that oil pollution from spills, oil well blow-outs, oil blast discharges and improper disposal of drilling mud from petroleum prospecting and other production waste have resulted in environmental degradation problems such as the loss of the aesthetic values of natural beaches due to unsightly oil slicks, damage to marine wildlife, modification of the ecosystem through species elimination and the delay in biota (fauna and flora) succession, and decrease in fishery resources. Thus there is increasing need to think of how to manage these situations that activities of the companies have created so that operations can continue (Ironkwe & Ordu, 2016). In an effort to savage the situation, a number of companies and other organizations are solidifying their environmental approach and developing business activities that take the environment into consideration as environmental conservation efforts continues to increase (Hassan, 2017).

The importance of environmental management cost as it relates to oil and gas companies in Nigeria cannot be overemphasized. This is because the sector is characterized by various situations that have a way of impacting on operations as well as performance as such ways of presenting a true and fair view of financial information that will give stakeholders especially the investors better opportunity to stick to the companies becomes essential. In a recent report of business day newspaper on the situation of oil and gas sector in Nigeria painted a bleak picture of falling performance. The stakeholders affirmed that there is a rising cost of production that has threatened the jobs in the industry as well as pose a threat to profits of the companies operating in the sector. According to Olushola (2020), the stakeholders revealed that there is prevalence of numerous levies paid to various bodies within the industry that increases the cost of production; insecurity leading to rising cost of production as a result of harsh investment environment as well as rising cost of production due to increased operational expenses, hence the need for adequate management of environmental cost by the companies in the industry.

Companies now regardless of whether they have direct impact on the environment are recognising that long term profitability or overall performance could be affected when they do not engage in activities that show that they are environmentally friendly or towards remediation of their activities impact on the environment (Iheduru & Ikechukwu, 2019). It becomes critical to engage in environmental management cost. While environmental accounting activities is concerned with how to identify, measure, report and manage environmental cost impact (Bailey, 2013; Arong et al., 2014). Some environmental costs could include current and future environmental impacts the company is responsible for and as well as labour costs associated with accounting for environmental costs. Effective control of environmental costs will increase the company’s overall profitability (ACCA, 2020). In other words, any cost that could be related to the environmental impacts of a product or a manufacturing process is an environmental cost. Some studies have concluded that environmental management cost problem cannot be eliminated. Earlier studies such as (Bassey et al, 2013; Arong et al., 2014; Musa et al., 2015; Norhasimah et al., 2016; Utile et al., 2017; Nwaiwu, & Oluka, 2018) have shown different results hence the need for a further study so as to ascertain the effect or relationship of environmental management cost on performance of firms. Therefore, this study is aimed at ascertaining the extent at which environment management cost has affected the performance of oil and gas companies in Nigeria.

**Conceptual Framework**

Based on research objectives and questions, two variables are apparent. They are environmental management costs which serve as the independent variable and financial performance serving as the dependent variable. The researcher used the diagram in figure 1.1 to illustrate the interaction of independent variables (Environmental Management Cost (EMC) and the dependent variable Financial Performance (FPF).
Study Aim and Objective
The main aim of this study is to investigate the effect of environmental management costs on financial performance of quoted oil and gas companies in Nigeria. Its specific objective includes to:
- Ascertain the effect of pollution costs on net profit of quoted oil and gas companies in Nigeria

Research Question
- What is the effect of pollution costs on net profit of quoted oil and gas companies in Nigeria?

Research Hypothesis
\[ H_0 \quad \text{Pollution Cost does not have a significant effect on Net Profit of quoted oil and gas companies in Nigeria.} \]

2. REVIEW OF RELATED LITERATURE
Concept of Environmental Management Cost
Environmental Management Cost is the specific cost that are related to reduction on the impact of environmental activities of the company such as pollution cost, waste disposal costs, drainage cost, regulation compliance costs and other costs that could lead to possible avoidance of environmental impacts by the activities of the companies. Environmental management cost is concerned with how to manage the costs associated with the activities that could lead to remediation and possible avoidance of environmental impacts by the activities of a company. Environmental management cost supports environmental protection through cost efficient compliance with environmental policies. For example, they could be seen in terms of planning and implementation towards pollution control investments or projects (ACCA, 2012). It involves also, investigating and purchasing cost efficient substitutes for toxic materials and the reporting of environmental wastes and emissions to regulatory agencies. Furthermore, it supports the simultaneous reduction of costs and environmental impacts through more efficient use of water and materials in internal operations (ACCA, 2020).
When it comes to strategic planning, environmental management cost is also significant in the sense that it supports the evaluation and implementation of cost-effective and environmentally sensitive programmes to ensure organizations' long-term strategic position. Typical example could be seen in terms of working with suppliers to carry out the design of products and services for environmentally-responsive market and to estimate internal costs of likely future regulations. Strategic planning may also involve reporting to stakeholders such as the customers, investors and the local communities. Putting all of these plans into action and translating them into cost and accounting purposes could be seen as what environmental management cost entails. In sum, environmental management accounting is simply a specialized part of the management accounts that focuses on things such as the cost of energy and water and the disposal of waste and effluent. It is argued that the focus of environmental management accounting is not all on purely financial costs. Other considerations are come to the fore in these contemporary times. This include issues such as the costs vs benefits of buying from suppliers who are more environmentally aware, or the effect on the public image of the company failure to comply with environmental regulations, (ACCA, 2020). And the principle behind environmental management accounting is to use some standard accountancy techniques to identify, analyze, manage and hopefully reduce environmental costs in a way that provides mutual benefit to the company and the environment, although sometimes it is only possible to provide benefit to one of these parties.

Environmental management cost is so critical that several international bodies have advocated for its compulsory computation and accounting. The significance of EMCA are identified as not only involving information provision, management planning and control but an adaptation from the German Environment Ministry (2003) identifies three broad benefits of EMCA as emphasis on Compliance, Eco-efficiency and Strategic positioning. Gray et al., (2010) emphasized that environmental accounting is not only about accounting for the environment, rather it is also to the extent that environmental issues can be reflected in conventional accounting practice. This is with the view of improving the condition of the natural world such as reduced land degradation and pollution abatement which enhances sustainable development. Examples are in planning and implementing pollution control investments or projects. It involves also, investigating and purchasing cost efficient substitutes for toxic materials and the reporting of environmental wastes and emissions to regulatory agencies. On the benefits of eco-efficiency, EMCA supports the simultaneous reduction of costs and environmental impacts through more efficient use of water and materials in internal operations. On strategic planning, EMCA supports the evaluation and implementation of cost-effective and environmentally sensitive programmes to ensure organizations' long-term strategic position. Examples are working with suppliers to carry out the design of products and services for environmentally-responsive market and to estimate internal costs of likely future regulations. Strategic planning may also involve reporting to stakeholders such as the customers, investors and the local communities. Conventional approaches of costing have become inadequate because they ignore important environmental costs and potential cost savings (Gray et al., 2010).

Oil and gas companies including the Multinational oil companies and other extracting firms are not putting adequate effort to minimize or prevent environmental problems affecting oil producing communities in Nigeria. Hence the relationships between the parties concerned are not encouraging (Eze et al., 2016). In addition, multinational companies in the oil producing communities have not been fully complying with environmental laws and regulations. Thus the effectiveness of these laws is yet to be seen. Unsustainable consumption of natural resources, increased contribution to Greenhouse gas emissions (GHG), contribution to ozone layer depletion amongst others are prevalent in Nigeria and serve as impediments to favourable business climate and human inhabitation in general. Multinational companies can contribute towards, sustainable environment by innovating and improving their products and processes in order to use raw materials more efficiently reduce the waste generated from their processes, improve the waste disposal methods and improve the work conditions. Stakeholders obviously require companies to manufacture goods efficiently and at competitive prices without degrading the environment. This can lead to an improvement in overall environmental performance, company performance, customers and community’s satisfaction (Eze et al., 2016).

Environmental management accounting uses some standard accountancy techniques to (i) identify (ii) analyses, (iii) manage and hopefully reduce environmental costs in a way that provides mutual benefit to the
company and the environment. For example activity-based costing may be used to ascertain more accurately the costs of washing towels at a sports Club. The energy used to power the washing machine is an environmental cost; the cost driver is ‘washing’. Once the costs have been identified and information accumulated on how many customers are using the club, it may be established that some customers are using more than one towel on a single visit to the Sports club. The club could drive forward change by informing customers that they need to pay for a second towel if they need one. Given that this approach will be seen as ‘environmentally-friendly’, most customers would not argue with its introduction. Nor would most of them want to pay for the cost of a second towel. The costs to be saved by the company from this new policy would include both the energy savings from having to run fewer washing machines all the time and the staff costs of those people collecting the towels and operating the machines. Presumably, since the towels are being washed less frequently, they will need to be replaced by new ones less often as well.

In addition to these savings to the company, are the all-important savings to the environment since less power and cotton or whatever materials the towels are made from is now being used, and the scarce resources of planet are therefore being conserved. Lastly, the club is also seen as an environmentally friendly organization, in turn, may attract more customers and increase revenues. Just a little bit of management accounting and common sense, can achieve all these things (ACCA, 2012). ACCA (2020) further stated that there are three main reasons why the management of environmental costs is becoming increasingly important in organisations. These are discussed as follows. First, society as a whole has become more environmentally aware, with people becoming increasingly aware about the ‘carbon footprint’ and recycling taking place now in many countries. A ‘carbon footprint’ (as defined by the Carbon Trust) measures the total greenhouse gas emissions caused directly and indirectly by a person, organisation, event or product. Companies are finding that they can increase their appeal to customers by portraying themselves as environmentally responsible. Hence there is the need to manage the environmental costs. Second, environmental costs are becoming huge for some companies, particularly those operating in highly industrialized sectors such as oil production. In some cases, these costs can amount to more than 20% of operating costs (ACCA, 2020), such significant costs need to be managed, otherwise it can create a huge hole on investors’ capital. Third, regulation is increasing worldwide at a rapid pace, with penalties for non-compliance also increasing accordingly. In the largest ever seizure related to an environmental conviction in the UK, a plant hire firm, John Craxford Plant Hire Ltd, had to not only pay £85,000 in costs and fines but also got £1.2m of its assets seized. This was because it had illegally buried waste and also breached its waste and pollution permits. And it is not just the companies that need to worry. Officers of the company and even junior employees could find themselves facing criminal prosecution for knowingly breaching environmental regulations. Thus management of costs—various types of environmental cost becomes necessary for continued operations.

However, it is argued that with these needs for proper and continued management of environmental cost, the management of environmental costs can be a difficult process. This is because first, just as EMA is difficult to define, so too are the actual costs involved. Second, having defined them, some of the costs are difficult to separate and identify. Third, the costs can need to be controlled but this can only be done if they have been correctly identified in the first place. Environmental costs could either be environmental measures or environmental losses. They include cleanup costs, costs of recycling materials or conserving energy, closure costs, capital expenditure and development expenditure (Nwaiwu & Oluka, 2018). These costs are incurred in preventing, reducing or repairing damage to the environment and conserving resources. However, environmental losses are costs, which bring no benefits to the business. Such as, fines, penalties, compensation, and disposal losses relating to assets which have to be scrapped or abandoned because they damage the environment. Further, environmental costs are the environmental damage an entity causes to the environment and its users as a result of its operations. There is also the general concern that environmental cost reduces operating flexibility, slow productivity of companies and thus could affect overall performance of the company (Effiong & Bassey, 2019). Accounting for environmental costs and the issues of environmental and social reporting are not explicitly provided for in the companies and allied matters act but has been catered for by both local and international standards like ISAR, Global reporting Index (GR) amongst others, hence the need to devise a means of accounting for it so that activities of the companies on the environment would not be reported in such a manner that statement of financial position would be
affected on the negative side whilst upholding the financial reporting standards. This is particularly important because, these days, corporate performance is no longer seen simply as being equivalent to and consequently measurable in terms of profitability alone (Nwaiwu & Oluka, 2018).

Pollution Cost

The current state of pollution in the world today is such that a large portion of the world’s population lacks access to clean air and water. The World Health Organization (WHO) recommends exposure levels of less than 60 to 90 micrograms per cubic meter per day for total suspended particulates, a major threat to human health. But in the mid-1980s, about 1.3 billion people - mostly in developing countries - lived in towns or cities that did not meet these standards (World Bank, 1996 as cited by Myers, 2019). Data from 1989-1994 indicate that eight of the eleven cities in Asia for which data was compiled exceeded the WHO recommended exposure levels for suspended particulate matter. Annual average exposure levels ranged from a low of 169.7 micrograms (Guangzhou, China) to a high of 444.9 micrograms (Xian, China) (World Research Institute 1996 as cited by Myers, 2019). In 1990, roughly 1.3 billion people still lacked access to safe drinking water, and 1.7 billion, predominantly in developing countries, lacked adequate sanitation (World Bank, 1996 as cited by Myers, 2019).

The consequences of water pollution are manifest in high morbidity and mortality from waterborne diseases. Diarrhea and intestinal worm infections still account for 10 percent of the total burden of disease in developing countries (World Bank, 1996 as cited by Myers, 2019). The effects of air pollution are seen in increased cases of respiratory illness and lung disease. In most rural areas in developing countries, household cooking fires, dust, and bacteria contribute to indoor air pollution and health consequences to a greater extent than previously thought. Evidence from limited and localized studies suggests that indoor health hazards can do more damage than those from outdoor pollution in the most affected urban areas. This may be explained by the consumption of traditional fuels (fuel wood, charcoal, bagasse, and animal and vegetable wastes). Consumption of such fuels accounted for 35 percent of total energy consumption in Africa, and for 21 percent in South America (World Bank, 1996 as cited by Myers, 2019). The burning of these traditional fuels contributes both to indoor and outdoor air pollution and cause respiratory illness and lung damage as well as increased concentrations of carbon dioxide.

From an economics perspective, pollution is generated because the environmental medium which is polluted (air and water), is a public resource over which no ownership exists or else is not enforced. This lack of ownership means that the use of the resource for any purpose (polluting, breathing, drinking, and fishing) is free, in the sense that the resource is not purchased and there is no cost or charge involved with its consumption or pollution. This reflects a ‘market failure’ because the market prices of the goods and services, whose production and consumption processes cause pollution, fail to reflect the true cost to society of the resource use. This market failure is translated into a spillover effect or externality. An externality or spillover effect is any impact on a third party’s welfare that is brought about by the action of an individual (or industry), and is neither compensated nor appropriated (Pearce & Warford, 1993 as cited by Myers, 2019).

Externalities may be either positive or negative, but environmental pollution is considered a negative externality. It constitutes both misuse of an unpriced (air) or open-access (water) public resource, and has negative spillover effects or external impacts on sectors and individuals who may or may not be parties to the pollution-generating activity (Panayotou, 1993 as cited by Myers, 2019). One example of an externality or spillover effect would be an upstream paper mill that discharges waste into a river, causing downstream pollution that damages fish stocks, reduces commercial and recreational fishing, and contaminates the water. The economic damage is an external cost borne by the commercial and recreational fishermen, and anyone who may depend on the river for their water supply.

The damage is reflected in reduced profits for the commercial fishermen, and as a loss of welfare for the recreational anglers. As long as the paper mill pays no compensation or takes no action to reduce the waste discharged into the river, society suffers an overall loss of welfare. In addition to market failure, there are also policy and institutional failures which contribute to pollution. Energy subsidies, for example, represent a policy failure as they further distort the true cost of natural resources. Lack of access to clean sources of energy, particularly in rural communities, represent an institutional failure because
governments fail to provide necessary services to their people (Myers, 2019). This study attempts to provide a basis primarily for correcting market and policy failures. Measures to correct institutional failures should be based on broader societal concerns.

In order to prevent or reduce pollution, the market prices of goods and services should more accurately reflect the cost pollution imposes on society. In other words, producers and consumers should pay for the right to pollute. Correcting policy failures - in the case where polluting activities are subsidized by government (e.g., energy production and consumption) - means that subsidies should be reduced or removed so that the incentive to waste energy and to produce or consume polluting energy is also removed. Correcting market failures means pricing externalities such as air and water pollution so that the costs they impose on human health and the environment are internalized into the production and consumption processes (Myers, 2019).

Pollution may be defined as either i) any discharge or residual resulting from production or consumption processes, or ii) the amount of discharge or residual from production or consumption processes that is in excess of an ecosystem’s absorptive capacity. Discharges or residuals may originate from any number of sources including domestic waste water, community solid wastes, industrial waste effluents, and wastes from agricultural activities such as runoff of excess pesticides and fertilizers. Pollution may be categorized by environmental medium (air, water, and land or solid waste). Physical data compiled on emissions includes categories for different sources such as industry (manufacturing, construction, sewage, mining) households, agriculture, forestry, utilities (electricity, water, gas), and others (Myers, 2019).

Different ecosystems will have different absorptive capacities over different time periods. Thus, different countries may have different environmental standards. In terms of human health, however, the absorptive capacity tends to be more homogenous. International standards for air pollution include the World Health Organization recommendations that are based on pollution levels in excess of a geographically defined air boundary’s (usually for major metropolitan areas) capacity to disperse or dilute emissions so that they do not pose a threat to human health. The absorptive capacity of global ecosystems such as oceans and the climate are less understood and would need to be agreed upon for standards to be applied at the global level.

The costs of pollution to society are of two kinds the costs which arise if no action is taken to address pollution, and the costs which arise if action is taken. The costs which arise if no action is taken are generally costs resulting from the effects of pollution on human health and the environment. The costs which arise if action is taken are those resulting from efforts made to reduce or eliminate the pollution source (Myers, 2019). Many of pollution’s impacts on human health and the environment can be quantified and calculated, but many pollution impacts are difficult to monetize or even quantify. Certain values placed on the natural world, such as beauty or religious values are extremely difficult to include in systems of monetary accounting, as these types of values are neither bought nor sold. This study attempts to examine those effects of pollution that can be quantified and looks at different methods of assigning monetary values to these effects, in order to determine their cost to society. Those pollution effects that are difficult to monetize are no less important, but we should rely on other systems of indicators to address these efforts (Myers, 2019).

The costs to society caused by pollution can be classified according to the two types mentioned above—those costs incurred by the polluting source when taking action to either reduce or eliminate the pollution, and those costs incurred by the individual or group of individuals effected by pollution. The previous example of the external effects of an upstream paper mill can be used to illustrate the two types of costs related to pollution. The upstream paper mill that discharges waste into a river will incur some amount of cost if it takes action to reduce the amount of waste it discharges into the river (Myers, 2019). This cost is termed costs-caused, as they are the costs associated with reducing or eliminating the source causing the pollution. Costs-caused are those costs associated with the entity (e.g., industry) that is actually causing the pollution. Costs-caused are usually accounted for by estimating the amount necessary to reduce or eliminate the pollution or to clean it up (Myers, 2019). For households, individuals and businesses, there are economic, health and welfare ‘costs’ (damages) or environmental impact costs associated with the current level of air and water quality (e.g., from being unable to obtain clean air and water). These types
of costs or impacts to human health and the environment are considered costs-borne since they are borne by individuals and households independent of whether they have actually or potentially caused the pollution. The downstream pollution discharged by the paper mill damages fish stocks, reduces commercial and recreational fishing, and contaminates the water (Myers, 2019).

The economic cost of reduced fish catches, the loss of recreational fishing ability, and the need to purify the water source, are costs-borne by the commercial and recreational fishermen, and anyone who may depend on the river for their water supply. In cost-benefit terms, costs-caused would correspond to costs, and costs-borne would correspond to benefits. For example, an analysis of a proposed policy to reduce lead-emissions to a specified, non-damaging level would estimate pollution control costs (costs-caused) for the industries emitting the lead, and the benefits of improved human health from the reduction in lead emissions (costs-borne that could be avoided if action is taken by the industry). Industry is causing environmental pollution, and households are bearing the costs associated with the pollution (Myers, 2019).

Pollution cost is a dimension of environmental costs. It involves detection costs, prevention costs and management cost. Detection costs involve costs that are resulting from activities to determine if products, processes and other activities within the company are in compliance with appropriate environmental standards. The costs include auditing environmental activities, inspecting products and processes, developing environmental performance measures, testing contamination and measuring contamination level. Trucosts Plc provides a total figure for direct and indirect external environmental costs (Thomas et al., 2007). The direct external environmental costs are imposed on the rest of the economy by the firm’s operations and are based on six direct emissions (a) Greenhouse Gases (GHG) Direct Costs, (b) Water Direct Costs, (c) Waste Direct Costs, (d) Land & Water Pollutants Direct Costs, (e) Air Pollutants Direct Costs, and (f) Natural Resource Use Direct Costs. The indirect external environmental costs are environmental impacts caused by six indirect emissions (a) Greenhouse Gases Indirect Costs, (b) Water Indirect Costs, (c) Waste Indirect Costs, (d) Land and Water Pollutants Indirect Costs, (e) Air Pollutants Indirect Costs, and (f) Natural Resource Use Indirect Costs.

Pollution prevention Cost Management
These are costs of activities which are meant to prevent the production of contaminants and wastes which could cause damage to the environment. The costs include costs incurred in evaluating and selecting pollution control equipment, quality environment consumables, designing processes, designing products and carrying out environment studies. Others are auditing environmental risks and developmental management systems. Arong et al., (2014) study on environmental management accounting highlighted that corporate managers are placing high priority on environmental accounting. Environmental accounting as a prevalent subject in the international community is not yet a priority in Nigeria. Dierkes (2013), in his works condemned the whole essence of placing monetary value above other human virtues in environmental issues. He also recognized the absurdity of discounting and discount enhancing future environmental impact on human values. From investigations with the Federal Ministry of Environment, EIA study conducted by the oil and gas (exploration and producing) and other companies having activities that impact on the environment has been accepted as a regulatory requirement in Nigeria. Achieving effective EIA is however froth with uncertainties in Nigeria since the objective estimation of input and output values is not so reliable. Besides, there is excessive fluctuation in the discount factor for purpose of benefit-cost analysis. Non-available market values for certain natural resources costs and benefits such as the fauna, fishing ponds or rivers, among others, makes it extremely difficult to place monetary value on the factors of measurement.

Financial Performance
Financial performance is a part of what is known as corporate performance of organizations. Also known as profitability, corporate performance is performance measurement by which organizational as well as management ability and efficiency can be measured. According to Stewart (2009), there are two kinds of performance, financial performance and non-financial performance; and financial performance emphasizes on variables related directly to financial report. Stewart (2009) also established that financial performance is a subjective measure of how well a firm can use assets from its primary mode of business
to generate revenues. The term is also used as a general measure of a firm’s overall financial health over a given period of time and can be used to compare similar firms across the same industry or to compare industries or sectors in aggression. Company performance is very essential to management as it is an outcome which has been achieved by an individual or a group of individuals in an organization related to its authority and responsibility in achieving the goal legally, and conforming to the morale and ethics. Company’s performance is evaluated in three dimensions. The first dimension is company’s productivity, or processing inputs into outputs efficiently. The second is profitability dimension, or the levels at which company’s earnings are bigger than its costs. The third dimension is market premium, or the level at which company’s market value is exceeding its book value (Wang, 2002). Researchers in the strategic management field have offered a variety of models for analyzing financial performance. However, little consensus has emerged on what constitutes a valid set of performance criteria. For instance, researchers have suggested that studies on financial performance should include multiple criteria analysis. This multidimensional view of performance implies that different models or patterns of relationship between corporate performance and its determinants will emerge to demonstrate the various sets of relationships between dependent and independent variables in the estimated models (Corrode, 2017). Several measures are used for measuring performance especially financial performance. These are profitability measures as well as investment measures. However, profitability measures have been mostly used and thus can give a quick assessment of the way the organization has fared financially. Profitability in the words of Sohail et al. (2011) refers to the ability of a firm to earn returns on investment made in its assets that has a positive net present value. They further maintain that a financial action that has a positive net present value will create wealth for shareholders and is therefore desirable.

**Net Profit**

Net profit is a measure of profitability. Profitability therefore, is a strategic objective pursued by economic unit. It reflects the ability of the company to invest the funds it receives from multiple sources and reduce its expenses to the extent that it achieves profits in order to maximize the wealth of the owners and to maintain the survival of the unit and its continuation (Ajanthan, 2013). Profitability represents a large number of policies and decisions. It is a general indicator of the company's profitability performance (Heikal et al., 2014). The aim of these companies is to maximize the wealth of owners by increasing profitability through investing in assets that achieve the greatest possible returns to increase the market value of its shares in the financial market (Ajanthan, 2013). Economists are concerned with the profits of the economic-profit units as an indicator of the strength and strength of the financial economy. Financial analysts also considered these profits to be used as a tool for financial forecasting and to differentiate between a variety of investment alternatives (Forester et al., 2016). Accountants are interested in forecasting profits in order to find the best way to enable the delivery of accounting information to their beneficiaries in order to assist economic decision makers.

Net Profit is an important component of the financial statements of the users of the financial statements for the purpose of making investment or credit decisions (Foerster et al., 2016). The efficiency of the economic unit is the outcome of the various policies adopted by the administration. It reflects the efficiency of its operational and investment decisions (Ajanthan, 2013). The profitability ratios measure the efficiency of the economic unit in optimizing its resources to achieve profits (Fida & Yunis, 2016). Income is an important factor in accounting because it is the main list of the project. It represents the report that measures the success of a project over a given period of time in exploiting available resources for profit, which is most useful from the point of view of investors to estimate current and future revenues, (Foerster et al., 2016), as well as the use of the information it provides to facilitate the financial analysis process, particularly those indicators associated with the profitability of the project, and to help make many economic decisions properly (Ajanthan, 2013).

**Environmental Management cost and Financial Performance**

Ifurueze et al., (2013) examined the impact of environmental cost on corporate performance in oil companies in the Niger Delta States of Nigeria. Primary data was used for the study. A survey of twelve oil companies was used for data gathering and multiple regression used for data analysis. Three selected
indicators of sustainable business practices - Community Development Cost (CDC), Waste Management Cost (WMC) and Employee Health and Safety Cost (EHSC) were used for the study. The results of the study indicated that sustainable business practices and corporate performance is significantly related. The study concluded by recommending that the management of oil companies in the Niger Delta States of Nigeria develop a well-articulated environmental costing system in order to guarantee a conflict free corporate atmosphere needed by managers and workers for maximum productivity and eventually improves corporate performance. In a similar vein, Che-Ahmad et al., (2015), examined the effect of environmental accounting on the financial performance of firms in Nigeria. The study utilizes a cross-sectional research design and content analysis to obtain environmental disclosure information from the audited annual reports. Regression was used for data analysis. The study revealed that there is a significant relationship between environmental accounting disclosure and firm’s financial performance when environmental accounting is moderated by firm-specific variables such as firm size, industry type and auditor firm type.

Thomas et al. (2007) discovered that a positive relationship between auditors and voluntary reserve disclosure in the United States oil and gas industry. A study done by Tan et al., (1990) also found no support that audit firms influence disclosure strategies of companies in Nigeria. Environmental accounting covers information relating to all aspects of the environment. It serves as a systematic approach in managing the environmental aspects of company activities, hence the following findings: (i) Lack of environmental reporting and disclosure standards significantly affects the reporting and disclosure uniformity of environmental related information in financial statements, annual reports and accounts.

**Theoretical Framework**

**Cost Reduction Model**

This theory was postulated by Hetch in (1999), and is formulated on the basis of environmental cost reduction model. It states that the lowest environmental costs will be attained at the point of zero-damage to the environment. It is considered that before environmental costs information can be provided, environmental costs must be defined. Environmental quality model is the ideal state of zero-damage to the environment, ‘which is analogous to environmental quality management (EQM), a zero-defect state of total quality management. This is certainly compatible with the concept of eco-efficiency. Discussing the relevance of this theory in contemporary times, Acti et al. (2013), emphasizes the need for environmentally friendly products and clean technology and stresses the need for business to produce a balanced report that includes reporting the impact of business activities on the environment, this can be achieved when they have attained the point where their costs equals the damages done to environment.

**Review of Empirical Literature**

Bessong et al. (2020) in their study investigated the impact of environmental costs on earnings per share, of oil and gas companies, in Nigeria. The fulcrum of the study was to investigate impact of environmental costs on earnings per-share of oil & gas companies in Nigeria as of 2010 to 2019. Major objective was to critically examine the impact of environmental costs on earnings per-share of oil as well as gas corporations. Expost facto design was used while study population was 15 oil and gas companies in Nigeria. Using multiple regression analytical techniques, Environmental Impact Assessment Agency and various Companies' annual reports were collected. The test result revealed that there was no significant relationship between oil spillage cost and gas flaring cost on earnings per-share of the oil as well as gas industries. Again, that fines as well as penalties paid by Nigeria's oil & gas companies negatively affected the earnings per share. It was therefore concluded that oil spillage with gas flaring costs do not significantly affect the earnings; for each share of oil & gas industries, as a result of the monopolistic nature of these companies in Nigeria. Base on that, it is recommended inter alia that, oil, as well as gas corporations operating in Nigeria, should take crucial measures to stay away from the payment of fines as well as penalties. And this oil and gas companies where their operations impacts the environment ought to enhance plans as well as guidelines for operating as internal corporate standards required to meet the values of the industry.
Chukwu et al. (2020) within Nigerian context investigated environmental liability provisions and earnings persistence of oil firms in Nigeria. The purpose of the study was to examine whether provision for environmental liability is associated with earnings persistence of oil firms in Nigeria. The study also examined whether changes in provision for environmental liability is associated with earnings quality. Data from four oil firms for the period 2012 to 2018 were analysed using ordinary least square regression with robust standard errors. Two hypotheses formulated for the study were tested by regressing future earnings on current earnings and other variables. Results showed that environmental liability provisions were not significantly related to earnings persistence. Changes in these provisions were also insignificantly related to earnings quality. The evidence supports institutional theory as basis for explaining the relationship between environmental liability provisions and earnings quality in Nigeria; indicating that the relationship is not driven by ethical considerations or stakeholder concern. There is need for a legal framework for environmental financial reporting in Nigeria to ensure that the environmental obligations of all polluting firms are adequately accounted for, and earnings numbers are ethically reported.

Onyekachi et al. (2020) in their study investigated environmental costs accounting and the earnings of oil firms in Nigeria. The aim of the study was to assess the effect of environmental investments on the earnings of listed oil and gas firms within the Nigerian economy over a ten year period (2008-2017). Ex post facto research design was adopted and secondary data were sourced from the financial reports of the five selected firms. Data analysis was conducted using the ordinary least square regression method and findings indicate that firms investments on the environment associates significantly with their earnings. The study recommended for all business units in Nigeria to keep pace with contemporary financial reporting issues by engaging in, and adequately reporting their investments in the replenishment of the planet as that will promote their organizational image and business. The study also noted that there is a gap in the reporting of environmental activities of firms largely drawn from unavailability of the global accounting standard to ensure accountability and harmonization of environmental reports; and so called on the International Accounting Standards Board to deliver a dedicated standard to fill this gap thus enabling the accounting profession to effectively contribute its quota towards a sustainable planet.

3. METHODOLOGY
The research design of this study is explanatory, historical and correlational in nature. The focus of an explanatory research design is to effectively explain the characteristics of a population or a social phenomenon (Saunders et al., 2007). This is usually effective where a quantitative framework is adopted for the study, where it is possible to establish the relationship or influence on one variable on the other. The study would be establishing whether or not a relationship exists between the variables of environmental management cost and financial performance of quoted oil and gas companies in Nigeria. Furthermore, the correlational method adopted, involves the use of regression analysis, which helps to measure the relationship between two variables. It helps to ascertain whether or not a variable has an influence on the other.

The study population comprises of Thirteen (13) quoted oil and gas companies in Nigerian stock exchange as at December, 2019, according to available data from Nigerian Stock Exchange, Port Harcourt office, and the period was from 2011 -2018. Purposive sampling technique where by Ten (10) of the quoted companies were chosen for the study. These are based on the companies that have been quoted earlier than 2013 when more indigenous companies were added to the list of the quoted oil and gas companies in Nigeria. Secondary sources of data are used as the main data collection sources. The relevant data for this study is collected from the annual reports and accounts of the companies available from Nigerian Exchange (various years). The data collected are from the period 2011 – 2018. The Annual reports includes Annual financial statements; annual sustainability reports where environmental costs details are found in the statements submitted at Nigerian Exchange for the years under study. The data collected were analyzed using Regression Analysis guided by a regression Model to analyze the relationship of the variables identified as well as ascertain whether or not they have influence over one another. This helped in testing the hypotheses.
Models Specification

Dependent variable is the Financial Performance (FPF), whilst the independent variable is the Environmental Management Cost (EMC). Furthermore, the NETP, is proxied for Financial Performance. Similarly, the dimensions of Environmental Management studied was Pollution Cost (PC). In view of the above, the following model is developed for this study

\[ FPF = f(EMC) \]  
\[ NEP = f(PC) \]  

In the linear form, Equation (2) converts to

\[ NEP = b_0 + b_1(PC) + e \]

Where \( b_0, b_1 \) are coefficients of regression parameters, \( e \) is error term.

Using Statistical Package for Social Sciences (SPSS) software, the variable was subjected to complementary statistical test and the result was used for analysis and for hypothesis verification.

4. RESULTS AND ANALYSIS

4.1 Descriptive statistics

Pollution Cost as a Dimension of Environmental Management Cost

Table 4.1: Descriptive statistics for Pollution Cost (n=80)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.046</td>
</tr>
<tr>
<td>Maximum</td>
<td>3.274</td>
</tr>
<tr>
<td>Minimum</td>
<td>3.174</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>14.354</td>
</tr>
<tr>
<td>Skewness</td>
<td>1.411</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>10.253</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>342.5237</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

Source: E Views window output, 2021

From table 4.1, the mean value of 3.046 indicates that pollution cost of the oil companies increased at an average rate of 3.046% over the period under study, with very high variability (standard deviation = 14.354). The skewness coefficient of 1.411 indicates that the distribution of pooled pollution cost data is also skewed to the right, and the Kurtosis coefficient of 10.253 indicates that the distribution of pollution cost is leptokurtic. This implies that the distribution of the pooled pollution cost data is non-normal. The non-normality of the pollution cost data is confirmed by the Jarque-Bera test which rejects the normality hypothesis (p-value = 0.0000) at less than 1% level of significance. Thus, there are more data extremes in the pollution cost dataset which adversely affected its distribution.

Net Profit as a Measure of Financial Performance

Table 4.2 shows the descriptive summary of net profit as a measure of financial performance.

Table 4.2: Descriptive statistics for Net Profit (n=80)

<table>
<thead>
<tr>
<th>Statistic</th>
<th>NEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.737643</td>
</tr>
<tr>
<td>Maximum</td>
<td>313.6364</td>
</tr>
<tr>
<td>Minimum</td>
<td>-31.68467</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>24.63464</td>
</tr>
<tr>
<td>Skewness</td>
<td>2.747084</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>12.23475</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>437.3514</td>
</tr>
<tr>
<td>Probability</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

Source: E Views window output, 2021
From table 4.2, the mean value of 5.738 indicates that net profit of the oil companies grew at an average rate of 5.738% over the period under study, with very high variability (standard deviation =24.63). The skewness coefficient of 2.747 indicates that the distribution of pooled net profit data is also skewed to the right, and the Kurtosis coefficient of 12.234 indicates that the distribution of net profit is leptokurtic. This implies that the distribution of the pooled net profit data is non-normal. The non-normality of the net profit data is confirmed by the Jarque-Bera test which rejects the normality hypothesis (p-value = 0.0000) at less than 1% level of significance. Thus, there are more data extremes in the net profit dataset which adversely affected its distribution.

4.2 Testing of Hypothesis

Test of Hypothesis 1

H0: Pollution Cost does not have a significant effect on Net Profit of quoted oil and gas companies in Nigeria.

Table 4.3: Regression Analysis showing the effects of Pollution Cost on Net Profit

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>67.054554</td>
<td>101.3735</td>
<td>0.54534289</td>
<td>0.6634</td>
</tr>
<tr>
<td>PC</td>
<td>2.601479</td>
<td>1.343575</td>
<td>2.676772</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

R-squared 0.752777 Mean dependent var 35.40600
Adjust R-squared 0.652786 S.D. dependent var 60.38567
S.E. of regression 59.35364 Akaike info criterion 11.35569
Sum squared resid 45767.11 Schwarz criterion 11.65437
Log likelihood -103.5369 Hannan-Quinn criter. 11.45396
F-statistic 6.673640 Durbin-Watson stat 2.267643
Prob(F-statistic) 0.002001

Source: E Views window output, 2020

Estimated model from the e-view shows that the model is linear and given as

NEP=67.054554 + 2.601479PC

PC is positively related to NEP. It means that, increase in PC will lead to increase in NEP.

Coefficient of Determination (R²)

The R² was estimated as 75.27% which implies that 75.27 percent of the total variation found in NEP is explained by the variation of PC. By decision rule, it is agreed that there is a strong presence of PC in NEP.

Adjusted Coefficient of Determination (R₃)

The adjusted R₃ estimated as 65.27% which implies that 65.27 percent of the total variation found in NEP is explained by the variation in PC. By the decision rule, it is agreed that there is a strong presence of PC in NEP.

Standard Error Test: The standard error test shows that standard error for PC is 1.343575 and it is found to be less than its parameter found to be 2.601479/2 =1.3007395. Going by the decision rule, that: if significant b₁ >S(b₁), the variables are statistically significant and if b₁ <S(b₁), the variables are statistically insignificant. This implies that PC is statistically significant with NEP.
Student’s T- Test: The student’s t-test estimates used to test the acceptability of the hypothesis, result shows that t-cal for PC is 2.676772 while its prob-value is 0.0000. By the decision rule: Accept null hypothesis (ho) if bi:<t;>t; (0.025)n-k and Accept alternative hypothesis (hi) if bi:>t; (0.025)n-k. From our result, we reject the null hypothesis and accept its alternative hypothesis that pollution cost has significant influence on net profit of quoted oil companies in Nigeria.

F-Statistics: The F-Cal was found to be 6.673640 while the f-probe value is 0.0000.

Decision Rule: If F-Cal>F-tab/prob-value, reject null hypothesis. If F-Cal<F-tab/prob-value, accept null hypothesis. From the result it implies that pollution cost has significant impact on net profit of quoted oil companies in Nigeria.

4.3 DISCUSSION OF FINDINGS

Effect of Pollution cost on Net profit

This study was carried out to assess the impact of environmental management cost in terms of pollution cost on the performance of quoted oil and gas companies in Nigeria. The result indicated that environmental management cost has a significant effect on financial performance of oil companies. Specifically, the result shows that pollution cost has a significant effect on net profit of the quoted oil and gas companies firms. In addition, the Adjusted R-squared of 0.75277 indicates that about 75.28% of the changes in financial performance in terms of net profit of the selected firms are accounted for by the influence of the pollution cost. Furthermore, on adjusted bases the net profit was 65.32% relative to pollution cost dimension of environmental management cost of the quoted oil companies. The coefficients of 2.601479 signify that pollution cost has a positive influence on net profit. The implication of this is that a 1% rise in pollution cost would result in a 2.601479 percent increase in Net profit of the oil companies. This result here is in line with earlier works of (Utile et al., 2017; Nwaiwu & Oluka, 2018; Ikpor et al., 2019) whose study results indicated that adequate disclosure on environmental cost and compliance to corporate environmental regulations have positive significant effect on financial profitability measures. The result however disagrees with that of Umuren et al.(2018) whose study result showed insignificant relationships between environmental accounting reporting and performance variables, that is, return on capital employed, net profit margin earnings per share, and dividend per share.

5. CONCLUSION AND RECOMMENDATION

In view of the findings of the study, it is concluded that Pollution cost has a positive and significant effect on Net profit of quoted oil and gas companies in Nigeria. Consequently, the study recommends that: In view of the significant effect that exists between environmental management cost and financial performance of the companies. It calls for increased effort towards management of the operations of the company so that minimal impact on the environment would be achieved. In other words, they should increase in their environmental spend if possible so that they would have zero environmental impact as proposed by cost reduction model. This can be done by engaging in more of remediation activities, so that stakeholders trust could be enhanced and these can reflect on the positive and enhanced financial performance for the companies.

REFERENCES


Heikal, M., Khaddafi, M., & Ummah, A. (2014). Influence analysis of return on assets (ROA), return on equity (ROE), net profit margin (NPM), debt to equity ratio (DER), and current ratio (CR),


