ENVIRONMENTAL AUDITING: A PANACEA FOR ENVIRONMENTAL SUSTAINABILITY IN NIGERIA

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Abstract

The recent spate of global warming and its insidious effect on the world's climate makes the need for sustainability pronounced. Global warming generates unsustainable features like ozone depletion, toxic pollution, species extinction and habitat, social conflict; poor sanitation and resource depletion. Most of these environmental degradations and emissions are anthropogenic. Therefore, the objective of this study is to examine if environmental auditing is a panacea for environmental sustainability in Nigeria. A survey research design was adopted in data collection and 'F' test was used to conduct test on hypotheses. The result revealed that each of the independent variable tested has significant relationship with the dependent variable. This implies that environmental auditing is a panacea for environmental sustainability in Nigeria. The paper therefore recommended that prescribed and dedicated standards on environmental auditing for auditors is paramount when conducting such audit since the positive relationship between environmental audit and its engagement by Nigerian firms. It was also since environmental audit affects environmental sustainability, government should use every opportunity to raise public, government, industry, foundation, and university awareness by openly addressing the urgent need to move toward an environmentally sustainable future.

Key: Environmental Accounting, Gas emission, ozone layers, sustainability.

INTRODUCTION

Effective and efficient management of environmental protection is a sinequanon for sustainable development in the world (Shil & Iqbal, 2005). This calls for environmental audit to be carried out in existing industries and environmental impact assessment to be carried out on new, major projects as stipulated in the Federal Environmental Protection Agency Regulations in other to maintain a good environmental management practice in companies.

The rationale behind the establishment of most companies is to maximize profit and minimize cost. However, the objective is not only increasing the company's profit but its multidimensional, economic, social and environmental (Hurley, 2009). In any case, the activities of oil companies, utilities, manufacturing companies in many cases, waste management companies, construction companies, and mining companies have posed serious threats to human existence. The reason is because factory pollutants and greater land use have harmed the natural environment and therefore calls for an action (Bala & Yusus, 2003). In particular, the application of machinery and science to agriculture has led to greater land use and, therefore, extensive loss of habitat for animals and plants. Even the climate change has impacted negatively on the loss of biodiversity, sea level rise, increased frequency and severity of some extreme weather events, and oceans. These factors, in turn, have caused many species to become extinct or endangered.

An organization's ability to achieve environmental objectives depends heavily on monitoring the continuous improvement of environmental performance through efficient planning of organizational, economic investments and necessary technological measures. It dawns on different stakeholders including environmental auditors to rise to the occasion. Cost accountants and economists have attempted to quantify these impacts in monetary terms, but these assessments can be controversial. The effects of different industrial sector activity on the environment vary enormously but it is an incontrovertible statement that damage is being done to the environment worldwide (Myers, 2006).

The activities human exerted on the companies can profoundly be affected by basic environmental systems and functions with significant implications for national economies and humanity as a whole (Sobhani Zainuddin & Amran 2011). It has also become evident that all countries at different stages of economic development have experienced environmental depletion and degradation. Unless otherwise stated, environmental accounting is the short form of integrated environmental and economic accounting (Akinbami & Adegbulugbe (2014). Yet without a systematic, quantitative, structured relationship between the environment and the economy, it is hard to know not only what the various economic contributions to environmental damage are, but also how the damage might be remedied. It is therefore not surprising that the inclusion of the environment in the system of national account came to be regarded as a necessity. The difficulties of such inclusion became a problem to be solved rather than an insurmountable obstacle.

It is against this backdrop that this paper wants to examine if environmental audit is a panacea for environmental sustainability in Nigeria. This is the gap this study attempts to fill and add to existing literature. The following hypotheses were raised: there is no significant relationship between environmental audit and

environmental sustainable in Nigeria; there is no significant relationship between environmental audit and its engagement by Nigerian firms; there is no significant relationship between firms in Nigeria that comply with the provisions of Environmental Impact Assessment Act and those that do not and there no significant consequences to non-compliance with environmental accounting and reporting and there is no significant relationship between Environmental audit and performances of the Nigerian firms

LITERATURE REVIEW

Environmental audit is an evaluation that aims at identifying environmental compliance and management system implementation gaps, along with related corrective actions (Adams & Frost, 2004). It performs an analogous function with financial audits.

Deegan and Unerman (2011) in their explanation maintained that environmental auditing is "essentially tool for measuring the effects of certain activities on the environment against set criteria or standards". It is designed to help organizations fulfill their managerial commitment and control of environmental practices, complying with environmental regulations and company policies (Owusu & Frimpong, 2012). Depending on the types of standards and the focus of the audit, there are different types of environmental audit. Organizations of all kinds now recognize the importance of environmental matters and accept that their environmental performance will be scrutinized by a wide range of interested parties. Environmental auditing is used to investigate, understand and identify environmental performance.

Bose (2006) opined that "environmental auditing is used to help in improving the existing human activities with the aim of reducing the adverse effects of these activities on the environment". An environmental auditor will study an organization's environmental effects in a systematic and documented manner and will produce an environmental audit report. There are many reasons for undertaking an environmental audit, which include issues such as environmental legislation and pressure from customers.

Ullah (2013) defined environmental audit as a management tool consisting of a systematic, documented, periodic and objective evaluation of environmental performance. It is a management systems and equipment that facilitate management control of environmental practices. It is paramount for assessing compliance with operations or activity's environmental policies, including meeting regulatory requirements.

South African Department of Environmental Affairs and Tourism (2004) defines Environmental auditing as a process whereby an organization's environmental

performance is tested against its environmental policies and objectives. These policies and objectives need to be clearly defined and documented.

Kamla,Gallhofer and Haslam (2006) were of the opinion that environmental audits are often done less rigorously because of the absence of appropriate documentation at this stage. The tests carried out includes: questioning; studying documentation; policies; procedures; work instructions; manuals and other materials that form a part of management systems; and the observation of scenes, processes and events. Evidence which supports the tests carried out is also assembled.

Todea, Stanciu, and Joldos (2011) defined environmental audits as "the process of reviewing activities and records against defined standards or procedures to establish what is being done and how far the process is complying with requirements". This evidence forms what is described as an "audit trail" and consists of copies or documents, photographs, references to sections of procedures and manuals, and notes on conversations and discussions. It should be possible to "follow an audit trail" afterwards and track how the findings and recommendations from an audit were arrived at.

Non-financial auditing could be viewed as a methodical examination of procedures and practices with the view of verifying whether they comply with internal policies, accepted practices and legal requirements (Greeno et al., 1987). No wonder the international Chamber of Commerce (ICC, 1991) defines environmental auditing as "a management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management and equipment are performing with the aim of contributing to safeguarding the environment by facilitating management control of environmental practices; and assessing compliance with company policies, which would include meeting regulatory requirements.

Simon and Hatherly (2008) defined environmental audit as "a systematic, documented, periodic and objective evaluation of an organization's environment management system and environmental performance, and communication of the results of the process to the organization's directors or senior executives". The aims of this are to establish the conformity of the organization's environment management system with the criteria set by the directors or senior executives. Secondly, to assess compliance with the organization's environmental policy and achievement of its environmental objectives and targets and finally to facilitate improvement in the organization's environmental performance.

DEAT (2004) in Owusu and Frimpong (2012) also explains environmental audit as "a systematic process that must be carefully planned, structured and organised". This implies that as part of a long term process of evaluation and checking disclosures, it needs to be a repeatable process which can be readily

replicated by different teams of people in such a way that the results are comparable and reflect change in both a quantifiable and qualifiable manner.

Pande, Duflo, Ryan, and Greenstone (2011) defined environmental auditing as a regular, independent, systematic, documented and objective evaluation of the environmental performance of an organization. It should measure how well organizations, management and equipment are performing with the aim of helping management to safeguard the environment.

Therefore, environmental auditing can be summarized defined as an independent examination of corporations or individual actions in an environment with the view of verifying both economic and non-economic events to ascertain whether such action is in compliance with environmental policies, accepted practices and legal requirements.

Obstacle to Sustainable Development

The following are generic environmental issues identified by the UNCTAD Obstacle to sustainable development:

Greenhouse Gas (GHG) Emissions: These include carbon dioxide (CO2), methane (CH4), nitrous oxide (N20), hydro- and per fluorocarbons (HFCs, PFCs) and sulfur hexafluoride (SF6) emissions from fuel combustion, process reactions and treatment processes. The climate change issue related to increasing concentrations of greenhouse gases is a global concern and – because it is closely linked to emissions from energy sources – is relevant across businesses.

Depletion of Nonrenewable Energy Resources: To Muller and Sturn (2001), energy consumption is a global issue and relevant to all businesses across sectors. The total energy consumed equals energy purchased or obtained minus energy sold to others for their use .The definition agreed for general applicability relates solely to energy consumed and transformed on site, which means that electricity companies would report the purchased energy amount and subtract energy sold, keeping generation and transfer losses as part of their consumption.

Depletion of Fresh Water Resources: Water consumption is the sum of all fresh water purchased from a water supplier or obtained from surface or ground water sources. Availability of fresh water is a global issue. Even though for many areas there may be no local concern about availability, it is increasingly costly to generate clean water. "Fresh water" includes water used for cooling purposes even if there is no physical contact to process materials, (UNCTAD, 2003). The Sum of all fresh water purchased from public supply, or obtained from surface or ground water sources (including water for cooling purposes) are expected to be reported in cubic meters. And the net value added per cubic meter got through the ratio of total cubic meter of water consumed over value added as the case may be.

Depletion of the Ozone Layers: Ozone depleting substance (ODS) emissions are a global concern, defined in the Montreal Protocol which lists the groups of gases that are contributing to the effect and describes their impact potential. Even though the effect will be visible in the stratospheric ozone layer over many decades or even centuries, the indicator might lose its relevance in the near future, when policies to eliminate ODS from applications continue to be implemented successfully on a global scale (Muller and Sturn, 2001). The Amount of ODS emissions to air from processes and losses/replacement from containments (chillers) are to be reported in metric tons of CFC11 equivalents.

Material Usage: resources such as the Sum of weight of all materials purchased or obtained from other sources, including: raw materials for conversion, other process materials, pre- or semi-manufactured goods and parts are expected to be reported in metric tons. And the unit of metric ton per net value added disclosed.

Challenges of Environmental Auditing and Sustainable Development Audits

The challenges to environmental and sustainable development audits include:

i. Lack of experience in carrying out such audits.
ii. Lack of effective monitoring and reporting systems of pollutants and other hazardous materials.
iii. Lack of codification and integration of environmental laws, rules and regulations necessary for the work of auditors.
iv. Inadequate international conventions, declarations and treaties.
v. Lack of environmental consciousness needed to protect vulnerable ecosystems, habitants and biodiversity as well as the impact of air and water pollution on human health and trans-boundary movement of hazardous waste.
vi. Absence of economic accounting of natural resources, resulting in inaccurate estimates of the existing assets and liabilities including future liabilities.
vii. Missing linkages of environmental issues between the political and economic policies.
viii. Inadequate environmental legislation, both at national and international level.

RESEARCH METHOD

In carrying out this study, the following techniques were adopted in analyzing the data collected. Analysis of Variance: This is used to break down the total variation of a dependent variable into different additive components due to various factor levels of an independent variable (source of variation). 'F' Test: This is used to test significance of the different levels of a factor (independent variable) on a dependent variable (in this study it is the environmental sustainability). The 'F' test was used to conduct test on hypotheses (1) to (4) in this study. Scheffer's Multiple Comparison Methods: This is used to compare

contrast in typical analysis of the variance problems intended to show how greater or lesser certain variables are in relation to other. In this study, it will be used to test hypothesis 5. Scheffer's confidence interval: This indicated the range within which the true value of the contrast will lie at a specified probability. It can be used as a mutually complementary approach to hypothesis testing involving test of significance.

DATA ANALYSIS

For the test based on 'F' distribution statistic like the 'F' ratio in the analysis of variance and Scheffer's test ratio stated that we reject the null hypothesis (Ho) and accept the alternative hypothesis (H1) if the computed value 'F' of Scheffer's test ratios exceed the critical value of 'F' at the specified level of significance and degree of freedom, otherwise we accept alternative hypothesis. With respect to the confidence interval for the Scheffer's multiple comparison methods for the contrast of mean decision rule is to accept the null hypothesis (Ho) and reject the alternative hypothesis (H1) if the null hypothesized value of the contrast (i.e. $\psi = 0$) falls within the confidence limit.

In hypothesis (1), the computed 'F' statistic for testing the significant difference in the relationship between environmental audit and environmental sustainability in Nigeria indicated 8.2549 and 8.0579 respectively. Both computed 'F' statistic exceed the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e. 3.957, we reject the null hypotheses and accept the alternative hypothesis. The decision is that there is relationship between environmental audit and environmental sustainability in Nigeria.

Hypothesis (2), the computed 'F' statistic for the testing the significant difference in the relationship between environmental audit and its engagement by Nigerian firms produced 8.0284, 4.3153 and 535.55 respectively. Since all the computed 'F' statistic each exceeded the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e. 3.957. We reject the null hypothesis and accept the alternative hypothesis. Thus, the decision is that there is significant relationship between environmental audit and its engagement by Nigerian firms.

While the computed 'F' statistic for testing the significance difference in the relationship between firms in Nigeria that comply with the provisions of Environmental Impact Assessment Act and those that do not, produced 6.8413 and 4.5247 respectively. Both computed 'F' statistic exceeded the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e. 3.957, we reject the null hypothesis and accept the alternative hypothesis. Consequently, the decision is that there is significant relationship between firms in Nigeria that comply with the provisions of Environmental Impact Assessment Act and those that do not. The computed 'F' statistic for

testing significance of the consequences to non-compliance with environmental accounting and reporting produced 18.9116, 21.3620 and 17.4158 respectively. Hence the computed 'F' statistic each exceeded the critical value of 'F' at 0.05 level of significance using 2 and 97 degree of freedom for V1 and V2 respectively i.e. 3.957. As a result, we reject the null hypothesis and accept the alternative hypothesis. The decision therefore, is that there is consequence to non-compliance with environmental accounting.

In hypothesis (5), all the computed Scheffer's test ratio for testing the significance relationship between environmental audit and performances of the Nigerian firms exceeded the critical value of 'F' (1-0.05); df: 2, 97 which is 3.957. Thus, the decision is that there is a significant relationship between environmental audit and performances of the Nigerian firms.

Source of Variation	**Sum of squares**	**Degrees of Freedom**	**Mean Square (MS)**	**'F' Ratio**
	(SS)	(DF)	MS=SS/DF	(MSB/MSW)
Between the means	6,174.27	2	3,087.14	6.53
Within the means	12768.62	27	472.91	
Total	18942.89			

Discursion of Findings

Findings from the data analysis unveiled important facts embedded in the research data. It was discovered that the each of the independent variable has significant relationship with the dependent variable. In hypothesis one, the decision is that there is significant relationship between environmental audit and environmental sustainability in Nigeria. It implies that environmental audit impact positively on environmental sustainability in Nigeria. Alternate hypotheses two, three, four and five were also upheld. What theses signify is that environmental auditing is a panacea for environmental sustainability in Nigeria since the firms that engaged in environmental audit do better, the firms that comply with the provisions of Environmental Impact Assessment Act do not face significant consequence to non-compliance with environmental accounting and reporting differs significantly. Lastly Environmental audit affect performances of the Nigerian firms.

CONCLUSION

As environmental audit affects performances of the Nigerian firms, enabling environment be provided for auditors to enhance decrease of environmental impacts while increasing the added value by the enterprise such that in both the short and long run, the Nigerian economy would experience a constant and viable

social, economic and environment that meets the needs of the present without compromising the ability of future generations and meet their own needs which sustainable development stands for. Therefore, based on the result from the test, itwas concluded that environmental auditing is a panacea for environmental sustainability in Nigeria since the firms that engaged in environmental audit do better than those that do not. Also, the firms that comply with the provisions of Environmental Impact Assessment Act face significant consequence to non-compliance with environmental accounting. Lastly Environmental audit affect performances of the Nigerian firms.

RECOMMENDATIONS

i. Government should use every opportunity to raise public by openly addressing the urgent need to move toward an environmentally sustainable future.
ii. Standards on environmental auditing for auditors when conducting an audit in other to strengthen environmental engagement audit by Nigerian firms.
iii. Baseline on environmental issues should be identified and the use of Graphical indicators be adopted illustrating to users on a timely basis whether the organization is performing above, below, or in-line with the targets so that corrective actions can be taken as needed to non-compliance with environmental accounting.

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