

# The Development of Environmental Accounting and Disclosure Practices of Manufacturing Companies in Nigeria

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## ABSTRACT

The study is an investigation into the development of environmental accounting and disclosure practices of manufacturing companies in Nigeria with emphasis on United Cement Company of Nigeria (UNICEM) Plc, Niger Mills Nigeria Plc and PAMOL Nigeria Ltd. The data for the study were collected through questionnaires administered and the annual reports obtained directly from the companies under study. The study employed independent t-test and Analysis of Variance (ANOVA) in the test of hypotheses. The findings of the study were that manufacturing companies do not charge environmental expenditures independently of other expenditures and the level of environmental cost awareness in manufacturing companies in Nigeria are not high. Based on the findings, it was recommended among other things that environmental expenditures should be charged separately of other expenditures, this will give room for more accountability on the companies' impact on the environment. More so, the level of awareness of environmental cost should be increased. This can be achieved by the ministry of environment liaising with relevant accounting bodies calling for training and retraining of accounting staff on environmental issues and how to track externality cost.

**Keywords:** environmental accounting, environmental expenditure, disclosure practices, environmental cost awareness.

## 1 INTRODUCTION

Environmental accounting has become the concern and focus of nations and responsible corporate management. It became one of the foremost issues on the agenda of nations and businesses earlier in the 1990's and the reasons for this were varied emanating from both within and outside of the firm and particularly at the global level (Okoye and Ngwakwe, 2004). A lot of government enactments, laws and regulations on environmental protection have been made in several nations of the world and Nigeria is slowly responding.

In the light of the awakening to environment protection, various laws and regulations were enacted and one of such is the Environmental Impact Assessment Act, 1992. These require corporate management to consider the environmental implications of all internal decisions of their management. Also all organizations monitored by environmental policy agencies in Nigeria are expected to demonstrate much consideration in decision making.

It is rightly said that the World's two greatest challenges are poverty and the systematic destruction of the environment. These two challenges have the capacity to destroy the entire world. It is considered that the world's poverty level, particularly in the less developed nations is largely due to the inability to manage the environment which is fast degrading. Whereas industrial emission and effluence constitute great threat to the atmosphere, the native farmers are no less a threat to the effect of the ozone layer, the seas, oceans and land. Local farmers also systematically destroy the biodiversity through continued crude method of farming, falling of trees and bush burning and fishing methods without replacement of the natural resources.

Environmental issues for purpose of economic and cost accounting have also been controversial even though the topic has been identified for discussion for the past years. This is so because common criteria for value measurement of non-marketed, non-monetized resources and impact on externalities have not been agreed.

In the past, corporate organizations have ranked business considerations based on profitability. Companies have also recognized all indirect expenditure as overheads without paying attention to the environment. Conventional accounting practice has not recognized environmental accounting for materials, water, energy and other natural resource usage. Also it have not provided for such practice and particularly for accounting for impact on externalities. According to B. Field and M. Field (2002) little was recognized of the environmental depletion and degradation to the environment until a few well meaning people in the developed countries realized that it was no good having great corporate profits and material well-being if they come at the cost of large scale of ecosystem by which we are nourished. It became clear that degradation, pollution and accelerated destruction of the ecosystem and the depletion of non-renewable environment biodiversity would soon become very dangerous to human existence.

In the light of the background of increasing environmental attention, and the fact that the manufacturing sector has a profound production impact on the environment, thus there is an urgent need to critically assess the development of environmental accounting and the disclosure practices of manufacturing companies in Nigeria. Hence, this is what the study seeks to achieve.

### 1.1. Research Hypotheses

In this study, the following null hypotheses have been postulated;

- i.  $H_0$ : Environmental expenditures are not charged independently of other expenditures in the manufacturing sector.
- ii.  $H_0$ : The level of environmental cost awareness in manufacturing companies is not high.

### 1.2. Organisation of the study

The rest of the paper is organized in four sections. The literature review and theoretical framework is contained in section 2. Research methodology is found in section 3. Section 4 contains data presentation, analysis and discussion of findings, while conclusion and recommendations are stated in section 5.

## 2 LITERATURE REVIEW AND THEORETICAL FRAMEWORK

### 2.1 Social Accounting

Gray, Owen and Maundes (1987) have defined social accounting as "the process of communicating the social and environmental effects of organizations economic actions to particular interest groups within society and to society at large". Crowther (2000) also defines social accounting sense as an approach to reporting a firm's activities which stresses the need for the identification of socially relevant behavior, the determination of these to whom the company is accountable for its social performance and the development of appropriate measures and reporting techniques of appropriate measures and reporting techniques.

Wiki (2009) recognizes social responsibility as an "ethical or ideological theory that an entity whether it is a government, corporation, organization or individual has a responsibility to society". It stated that Corporate Social Responsibility (CSR) also imply that corporations have an implicit obligation to give back to society (such as is claimed as part of corporate social responsibility and/or stakeholders theory). The World Business Council for Sustainable Development (cited in Obalola, 2008) in 1998 conceived CRS 'as the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as the local community and society at large.

### 2.2 Quality of Life Theory

Quality of life (QOL) of CSR is defined by Hass (1999) in Owolabi (2007) as:

A multidimensional evaluation of an individual's current life circumstances in the context of the culture in which they live and the values they hold. QOL is primarily a subjective sense of well being encompassing physical, psychological social and spiritual dimensions. In some circumstances, objective indicators may supplement or in the case of individuals unable to subjectively perceived serve as a proxy assessment of QOL.

According to Dierks (1979) in Owolabi (2007), the theory asserts that unrestrained industrial production for economic development has not only resulted in increase of social cost in heavy proportions but also evident in environmental pollutions and social ills. The adverse effect has triggered of society's negative attitude toward industrialization. Business organizations are therefore regarded as villains since they are responsible for degradation of the environment and all the social ills. It is expected that to enhance the QOL of the society that there should be a primary determination of government policies.

### 2.3 Environmental Accounting

The study of Nagle (1994) on environmental accounting reveals 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. B. Field and M. Field (2002) explain pertinent aspect of environmental degradation and costs as those including emission into air, water, and land. Also aspect of untreated domestic waste outflows into rivers and coastal ocean, quantities of solid waste that must then be disposed of, perhaps through land spreading or incineration. Pollution include airborne Sulfur dioxide (SO<sub>2</sub>) emission from power plants by stack-gas scrubbing which leaves a highly concentrated sludge and degradation which incorporates midnight dumping, illegal dumping along the sides of roads or in remote areas.

Field (2001) have done tremendous work on the economics of natural resources and in this instance explored the approach of benefit-cost analysis through discounting of future based input and output values of environmental projects and activities. Measuring benefit-cost analysis has been essentially through regulatory Evaluation Impact Assessment (EIA) study on the environment.

Enaharo (2009) in his investigation with the federal ministry of environment, EIA study conducted by the oil & gas (exploration and producing) manufacturing and other companies having activities that impact on the environment has been accepted as a regulatory requirement in Nigeria. Achieving effective EIA is however fraught 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 pods or rivers, among others, makes it extremely difficult to place monetary value on the factors of measurement.

#### 2.3.1 Environmental Accounting Defined

The term environmental accounting has many meanings and uses. It can support national income accounting, financial accounting or internal business managerial accounting.

At all times, it is important in decision making to provide accurate costs formation. The consciousness and need to protect the environment will make for environmental costs to be identified, accurately measured and reported. Besides, certain environmental costs have previously been reported conventionally along with companies' overheads before allocation to products or processes. Sometimes they have been totally left out of financial reporting because they constitute externality social costs which did not form part of bottom line financial reporting. Adverse effect on the society known as environmental social costs, or externality costs is a critical issue for consideration.

Hansen and Mowen (2000) have defined environmental costs 'as costs associated with the creation, detection, remediation and prevention of environmental degradation'. At AT & T, according to the US EPA (1995), Green Accounting or Environmental Accounting is defined as 'Identifying and measuring the costs of environmental materials and activities and using this information for environmental management decisions. The purpose is to recognize and seek to mitigate the negative environmental effects of activities and systems'. Howes (2002) defines Environmental accounting as 'the generation, analysis and use of monetarized environmentally related information in order to improve corporate environmental and economic performance.

In the opinion of Howes (2002), environmental accounting does not only focus on internal and external environmental accounting but links environmental and financial performance more visibly. Environmental accounting assists in getting environmental sustainability embedded within an organization's culture and operations. The aim is to provide decision makers with the information that enable the organization to reduce costs and business risks and to add value.

#### 2.3.2 Significance of Environmental Accounting

Environmental costs are one of the many different types of costs businesses incur as they provide goods

and services to their customers. Environmental costs and performance deserve management attention for the following reasons:

- i) Many environmental costs can be significantly reduced or eliminated as a result of business decisions, ranging from operational and housekeeping changes, to investment in "greener" process technology, to redesign of processes/products. Many environmental costs (e.g. wasted raw materials) may provide no added value to a process, system, or product.
- ii) Environmental costs may be obscured in overhead accounts or otherwise overlooked.
- iii) Many companies have discovered that environmental costs can be offset by generating revenues through sale of waste-by-products or transferable pollution allowances or licensing of clean technologies.
- iv) Before management of environmental costs can result in improved environmental performance and significant benefits to human health as well as business success.
- v) Understanding the environmental costs and performance of processes and products can promote more accurate costing and pricing of products and can aid companies in the design of more environmentally preferable process, products, and services for the future.
- vi) Competitive advantage with customers can result from processes, products and services that can be demonstrated to be environmentally preferable.
- vii) Accounting for environmental costs and performance can support a company's development and operation of an overall environmental management system (EMS). Such a system will soon be a necessity for companies engaged in international trade due to pending international trade due to pending international consensus standard 150 14001, developed by the international organization for standardization.

Environmental Protection Agency's (EPA) work with key stakeholders leads it to believe that as businesses more fully account for environmental costs and benefits, they will clearly see the financial advantages of pollution prevention practices. Environmental costs often can be reduced or avoided through pollution prevention practices such as product design changes, input materials substitution, process redesign, and improved operation and maintenance (O & M) practices.

### 2.3.3 Problems of Environmental Accounting

Hecht (1999) opined that "building a nation's economic use of the environment (and environmental degradation) into its accounts is a response to several perceived flaws in the system of National Accounts (SNA)..." Hecht identifies the difficulties of environmental accounting in Nations as:

- i) Cost of environmental protection cannot be identified. It is cited for example, that money spent to put pollution control on smokestacks will increase GDP, even though the expenditure is not economically productive.
- ii) Certain environmental goods are not marketed even though they provide economic value, e.g. fuel wood gathered in the forests, meats and fish gathered for consumption. Water for drinking and irrigation are not priced in themselves apart from the technology applied to make the water available.
- iii) When certain nations include these resources in their system of National Accounts, no standard practices exist for comparability.

Hecht (1999) observed that nations incorporate into their national accounts differently depreciation of manufactured capital and natural capital. That whereas buildings or machines are depreciated in the accounting conventional manner, but the consumption of natural resources is treated as income. A major challenge which is yet to receive a consensus among nations is valuation of natural resources resulting from resource depletion for the balance sheet (statistics Canada: 2006).

### 2.4 Environmental Cost Disclosure

Corporate organizations are engaging more actively in environmental disclosure in their annual financial statements. This is peculiar with more financially successful companies in both the U.S.A and the U.K. In the United State of America, SEC regulations and accounting standards requires American companies to disclose environmental information in annual reports.

Disclosure entails the release of a set of information relating to a company's past, current and future environment activities, performance and financial implications. It also comprises information about the implications resulting

from corporate environmental management decisions and actions. These may include issues such as expenditures on operating costs for pollution control equipment and facilities present or potential litigation, air, water or solid waste releases; description of pollution control processes or facilities.

Soonawalla (2006) observes that the main environmental issues in financial reporting are summarized as:

- Environment costs, whether to expenses or capitalize.
- Classification of environmental costs
- Treatment of environmental related financial impacts on assets
- Treatment of liabilities and contingent liabilities and how to recognise these.
- Disclosure conditions and or / breakdown about environmental costs.
- Measurement of liabilities and contingent liabilities.
- Environmental reserves, provision and charges to income
- Impact of accounting rules (GAAP) on corporate behaviour.
- Environmental information to be disclose in greater details.

### 2.5 Institutional and Policy Framework

In recognition of the importance of addressing the problem of environmental degradation, the government of Nigeria established the federal environmental protection agency (FEPA) in 1988, now federal Ministry of Environment. The duties include devising policies for the protection of the environment such as biodiversity and conservation, management and monitoring of environmental standards. The federal ministry of environment is also saddled with the responsibility for the sustainable development of Nigeria's natural resources and the development of operation of procedures for conducting environmental impact assessment of all development projects. To ensure that the federal ministry of environment is empowered to manage environmental issues, the environmental impact assessment (EIA) Act was passed in 1992 under FEPA. The EIA Act, 1992 empowers the regulatory institution to ensure the implementation of mitigations measurement and follow-up programmes such as elimination reduction or control of the adverse environmental effects of any project. Also, responsible for the restitution of any damage caused by such effects, through replacement, restoration, compensation or any other means (FEPA, 1992).

According to the same source, the following are some of the identified export induced increases in production that have increased environmental problems in Nigeria:

- Deforestation and desertification resulting from the exploitation of unprocessed log wood for export.
- Depletion of wild fauna and flora due to exploration of certain endangered species.
- Depletion of fish stock resulting from over fishing in the territorial waters for exportation,
- Oil and Gas exploration which has resulted in serious environmental degradation especially in the Niger Delta area of Nigeria.

### 3. RESEARCH METHODOLOGY

The study is an exploratory research. The investigation is based on a sample of three (3) selected manufacturing companies in Nigeria, namely; United Cement Company of Nigeria (UNICEM) Plc, Niger Mills Nigeria Plc and PAMOL Nigeria Ltd. The sampling technique used for this study is the judgment (purposive) sampling. The three manufacturing companies were deliberately chosen because of the magnitude of emission released to the environment and the volume of products and staff strength.

The data for the study were obtained from both primary and secondary sources. The researcher has largely sourced company annual reports directly from the companies under study. Also primary instruments through questionnaire administration to sample companies were utilized. It is considered that both research methods will be complementary and make for fuller evaluation of the true state of environmental accounting and disclosure practices among sample companies.

The study employed independent t-test and Analysis of Variance (ANOVA) in testing hypothesis one and two respectively.



#### 4 DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

##### 4.2 Presentation and Analysis of Data

Table 4.1, shows about 23% responded very high and high to the issue of whether environmental capital expenditure are tracked independently, 58% responded low and very low while 19% responded that they are ignorant of environmental cost issues at all.

Table 4.2 shows that about 26.2% asserted very high and high to the issue of environmental disclosure practices of their companies, 46% responded low and very low while 27.7% responded that they are ignorant of environmental disclosure practices.

Table 4.3 shows the response to the level of awareness of accounting for environmental cost in companies, 23% responded high and medium respectively while 54% responded that the level of awareness is low.

##### 4.3 Test of Hypotheses

###### Hypothesis One

$H_0$ : Environmental expenditures are not charged independently of other expenditures in the manufacturing sector.

$H_1$ : Environmental expenditures are charged independently of other expenditures in the manufacturing sector.

Decision Rule: The decision rule is specified thus:

Computed t-scores < Tabulated t-scores = Accept  $H_0$

Computed t-scores > Tabulated t-scores = Reject  $H_0$

This implies that the null hypothesis ( $H_0$ ) is accepted if the computed t-scores value is less than the tabulated or critical t-scores value. Otherwise the null hypothesis is rejected.

###### Computation of the t-test statistics.

###### Group Statistics

	VAR00002	N	Mean	Std. Deviation	Std. Error Mean
exp	environmental expenditure	87	13.4483	2.01597	.21614
	other expenditur	43	13.4884	2.00442	.30567

###### Independent Samples Test

		Levene's Test for equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
exp	Equal variance assumed	.076	.784	-.107	128	.915	-.04010	.37510	-.78230	.70210
	Equal variance not assumed			-.107	84.215	.915	-.04010	.37437	-.78454	.70434

Conclusion: since the computed t-score values of 0.107 is less than the tabulated or critical t-scores value of 1.98 obtained for 128 degrees of freedom (df) at 0.05 level of significance, the null hypothesis ( $H_0$ ) is accepted while the alternative hypothesis is rejected.

We therefore conclude that environmental expenditures are not charged independently of other expenditures in

the manufacturing sector.

### Hypothesis Two

$H_0$ : The level of environmental cost awareness in manufacturing company is not high.

$H_1$ : The level of environmental cost awareness in manufacturing company is high.

Decision Rule: The decision rule is specified thus:

Computed f-ratio < Tabulated f-ratio = Accept  $H_0$

Computed f-ratio > Tabulated f-ratio = Reject  $H_0$

This implies that if the computed f-ratio value is equal to or greater than the tabulated f-ratio value, it is significant and the null hypothesis ( $H_0$ ) is rejected at that level. Otherwise the null hypothesis ( $H_0$ ) is accepted.

### Computation of the ANOVA test statistics.

### Test of Homogeneity of Variances

awareness			
Levene Statistic	df1	df2	Sig.
3.243	2	127	.042

### Descriptives

awareness								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
low environmental cost awareness	75	13.5487	1.93330	.22324	13.1019	13.9915	10.00	18.00
medium environment cost awareness	35	13.0571	2.36323	.39946	12.2453	13.8689	10.00	18.00
high environmental cost awareness	20	13.8500	1.49649	.33462	13.1496	14.5504	11.00	16.00
Total	130	13.4615	2.00447	.17580	13.1137	13.8094	10.00	18.00

### ANOVA

awareness					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.285	2	4.643	1.158	.317
Within Groups	509.022	127	4.008		
Total	518.308	129			

Conclusion: Since the computed f-ratio value of 1.158 is less than the tabulated f-ratio value of 3.07 with 2 and 127 degree of freedom (df) the null hypothesis ( $H_0$ ) is accepted while the alternative hypothesis ( $H_1$ ) is rejected at 0.05 level of significance.

We therefore conclude that the level of environmental cost awareness in manufacturing company is not high.

### 4.3 Discussion of Findings

Based on the results of the hypotheses, it is obvious in hypothesis one that environmental expenditure are not charged independently of other expenditures. In other words, manufacturing companies cannot substantiate the

difference between environmental expenditures and other expenditures; hence, they tend to allocate all expenditure irrespective of their sources together thereby including environmental expenditures with other expenditures. This is as a result of the inability of manufacturing companies to track down environmental cost expenditure. These findings collaborate with the findings of Enaharo (2009) which upheld that in developing countries, environmental cost expenditures are not charged independently.

In the same direction, hypothesis two opines that the level of environmental cost awareness in manufacturing companies is grossly low. This therefore shows a follow up with the first hypothesis, because of the low environmental cost awareness, manufacturing firms therefore charge environment cost expenditures along side with other expenditures, which in the real sense was supposed to be charged independently.

## 5 CONCLUSIONS AND RECOMMENDATIONS

Based on the study, the following conclusions were drawn:

In manufacturing companies, all expenditures are charged together which makes it difficult to account for externality cost.

Also the level of awareness of environmental cost is grossly low in manufacturing industries

Based on the findings, the study recommended the following:

1. Environmental expenditure should be charged separately of other expenditures this will give room for more accountability on the companies' impact on the environment.
2. The level of awareness of environmental cost should be increased. This can be achieved by the ministry of environment liaising with the relevant accounting bodies calling for training and retraining of accounting staff on environmental issues and how to track externality cost.
3. The National Accounting Standard Board (NASB) should make a standard on reporting of environmental issues and ensure compliance by companies.
4. There should be qualitative disclosure which should be accompanied by precise and clear financial information that is useful in the evaluation of the economic consequences emanating from environmental problems.
5. For future research, a study of this nature with a wider scope should be under taken.

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TABLES

TABLE 4.1: Response to: To what level are environmental expenditure tracked independently

RESPONSE	NO. OF RESPONDENT	PERCENTAGE
Very High	10	8%
High	20	15%
Neither High nor Low	25	19%
Low	40	31%
Very Low	35	27%
<b>TOTAL</b>	<b>130</b>	<b>100%</b>

Source: Field work

TABLE 4.2: Response to: To what extent is your company's disclosure practice on environmental costs?

RESPONSE	NO. OF RESPONDENT	PERCENTAGE
Very High	10	7.7%
High	24	18.5%
Neither High nor Low	36	27.7%
Low	30	23%
Very Low	30	23%
<b>TOTAL</b>	<b>130</b>	<b>100%</b>

Source: Field work

TABLE 4.3: Response to: what is the level of awareness of accounting for environmental cost in your establishment?

<b>RESPONSE</b>	<b>NO. OF RESPONDENT</b>	<b>PERCENTAGE</b>
High	34	23%
Medium	30	23%
Low	60	54%
<b>TOTAL</b>	<b>130</b>	<b>100%</b>

Source: Field work

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