ENVIRONMENTAL ACCOUNTING PRACTICES BY CORPORATE FIRMS IN EMERGING ECONOMIES: EMPIRICAL EVIDENCE FROM NIGERIA

Abstract

The issue of environmental accounting is an emerging issue in developing economies like Nigeria. Though, the Federal government has enacted various environmental laws and established agencies and regulatory bodies; the problem has been that of enforcement and compliance with the various regulations. On the part of the corporate firms which claim to have policies and operating standards on environmental issue, the severity of the impact of their operations have not been abated; and hostilities and tensions with host communities have increased. This paper assessed the impact of government legislations on environmental accounting practice and compared current practices across firms in different sectors of the economy. A survey of 25 quoted firms from different sectors of the economy revealed that much attention has not be given to the cost of natural resources damages in project evaluation. The hypotheses were tested using Chi-square and Kendall Coefficient of Concordance at 5% level of significance. The results of the hypotheses testing showed that environmental accounting practice is significant in benchmarking standard for corporate reporting and that compliance with Nigerian environmental protection laws has not had significant influence on environmental accounting practice because the issues of enlightenment, enforcement and compliance have been overlooked. It was revealed that in developing an appropriate Environmental Management System (EMS), the contribution of plant environmental staff is important; they should work in cooperation with accountants. This paper recommended that accounting professionals need to be trained in environmental accounting methods and the Financial Reporting Council (FRC) should develop an accounting standard that will incorporate full consideration of financial and physical impacts of business activity on the environment.

Keywords: Environmental costs, Environmental Accounting, Environmental ethics,, Cost allocation, Pollution control.

Introduction

In developing or emerging economies of the world like Nigeria where there is infrastructural decay, lack of appropriate technology, lack of appropriate regulatory framework and high level of corruption, much attention have not been given to the degradation of the ecosystem through pollution, various emissions, natural resources damages etc; as a result of

activities of companies. The resultant effects have been social unrest, diseases and violent protest in many communities where these companies are sited. The crises in the Niger-Delta region of Nigeria are off shoot of these environmental degradation and neglect.

In the 1990s, all corporate organizations faced a climate of rapid change and an increased regulatory requirement. (White, Savage & Brody, 1995). Among the major changes that occurred are environmental obligations both legal and moral. There were also pressures on business and other organizations to respond to public issues such as, man-induced climatic change, that is, depletion of the ozone layer, need for waste management, a need to avoid polluting the earth, water and air, a need for recycling, and a need for a safe and clean environment. It is therefore necessary for these corporate bodies to put in place an Environmental Management Accounting System with a set of principles and procedures based on internationally accepted financial accounting methods towards enhancing corporate responsibilities (Daferighe and Aje, 2005).

Corporate compliance with accounting standard IAS 37 on contingency costs creates the need for tracking and reporting environmental liabilities that affect the Statement of Financial Position of a firm. According to Edward (1992), there is the need for regular and systematic appraisal of the anticipated cost "reasonably likely to have a material effect" on the financial position of a firm. According to Gray (1993), Rubenstein (1994), the concern of environmental managers spill over into both the financial accounting and managerial accounting concerns of the company. They opined that, the accounting profession remains dominated by financial accountants whose responsibility is largely information gathering and in this case, to support external reporting to shareholders and regulators. MacLean and Rappaport (1998) assert that it is important to integrate environmental issues into accounting metrics and decisions.

On their part, Akers and Porter (1995) assert that the accounting functions are considered "one of the primary groups responsible for developing firm's strategies". While this assertion may be overstated, it is true when it comes to decision-making as well as the selection of firm strategies. In a very basic sense, accounting functions have four roles to perform for companies: aiding in strategic decisions, controlling current costs, cash flows and current decisions, and finally, filing required information (Daryl, Ranganathan & Banks, 1995). The spillover that occurs on issues of environmental consequences covers these four

areas as well.

According to Popoff and Buzzelli (1993), the vision is; creating accounting systems that will allow both firms and their stakeholders (investors, customers, environmental organization, host communities) a clear perspective on the total environmental effect of a company. Environmental staffs have been the prime movers in rethinking how accounting systems can better serve the firm's long-range environmental management objectives.

White et al (1995) in their study to survey current corporate environmental cost accounting practices as they applied to the capital budgeting decision in United States of America (USA) in manufacturing firms, seek to provide business managers and government agencies with an understanding of how firms are integrating environmental cost considerations into decisions about environmental investments. They observed that it was quite common for financial analysis of investment alternatives to exclude many environmental costs, cost savings, and revenue. As a result, firms may not have recognized financially attractive investments in pollution preventions and “clean technology”.

Justifications for the Study

The Federal Government has established various environmental laws among which are the Harmful Waste Act 1988, Solid and Hazardous Management Regulation 1991, and the Environmental Impact Assessment (EIA) Act of 1992. The States including the Local jurisdictions within each State of the country have also enacted many other environmental laws based on hazardous contamination control like the waste disposal law, law against bush burning and periodic environmental sanitation exercises. The problem has been that of compliance and enforcement of the various environmental laws. One major problem has been that of disclosure in environmental reporting/accounting. Government has therefore established agencies and regulating bodies such as the Federal Environmental Protection Agency (FEPA) now Ministry of Environment and their counterparts in the states. They have statutory powers to require compliance from corporate firms.

In spite of the statutory powers of relevant environmental agencies, the problem of enforcement and compliance with the various Environmental Acts could be a Herculean task. Compliance with laws on environmental issues could be a function of attitude of various operators and management of the various corporate firms to their environment. Self

consciousness and intelligent management of the earth is one of greatest challenges facing humanity. There is therefore the need for a new environmental ethic to meet these challenges. Environmental policies of corporate firms or fundamental value attached to environmental issues are based on the perception of the operators/managers; of the moral basis of environmental responsibility. Their perceptions may be influenced by various theories of moral responsibility to the environment such as anthropocentrism, biocentrism and ecocentrism (Enger & Smith, 2000).

Cost allocation too, remains a major challenge. Most firms continue to place most environmental costs initially into overhead accounts. Though some subsequently allocate those cost to products or processes; the basis upon which these allocation are made are often ill conceived, that is, they bear little or no relationship to the activities, which are responsible for their creation. When proper allocation does not occur, managers receive distorted signals regarding the true costs and benefits of retaining or changing a process/product (White et al, 1995). This is the more reason why Activity-Based-Costing (ABC) is being canvassed.

Many corporate firms like Shell Petroleum Development Company, Lafarge WAPCO (Nig) PLC, Nigerian Breweries Plc, Berger Paints (Nig) PLC and the likes claim they have policies and operating standards with regard to the Environment, Health and Safety (EHS). However, the activities of some companies have severely impacted on the environment leading to degradation which is cost to the environments. The crisis in the Niger-Delta region of Nigeria is a fall-out of this. There have been exploitation of labour, indifference to health and safety issues, abuse of human rights, and a lack of concern for local issues. These are external impact costs that could negatively affect the reputation of the firms.

The objective of this paper is to assess how government legislation promotes or impedes improved environmental accounting practice, while comparing current practices across firms of different types.

The basic assumptions in this paper are as follows:.

(i) **(H_{01}):** Environmental accounting practice is not significant in benchmarking standard for corporate reporting.

(ii) **(H_{02}):** The compliance with Nigerian environmental protection laws has no significant influence on environmental accounting practice.

Methodology

This is an empirical investigation of corporate firms in Nigeria and is limited to twenty-five (25) quoted firms selected from the various sectors of the economy. Some sectors were not represented because focus is on companies involved in conversion of raw materials to finished products. At least two companies were selected from the chosen sectors. The basis was their quoted share prices; at least one company with the highest sectoral price and another with the lowest sectoral price were selected. They were classified as 'big' and 'small' company respectively. Twenty (20) copies of questionnaires were administered in each of the sampled companies making a total of 500 questionnaires in all. However, there was 87% response rate as 435 questionnaires were returned. The sectors investigated are namely; Agro-allied, Automobile and Tyre; Breweries; Building Materials; and Chemical Paints. Others are Conglomerates; Food and Beverage and Tobacco; Healthcare; Industrial/Domestic Product; Petroleum; Printing and Publishing; and Textile. The period of review is 2008-2012. A general paucity of data in Nigeria for planning and lack of comprehensive and objective corporate level data on environmental damages in Nigeria is a major limitation to research of this type, hence no secondary data on environmental damages in Nigeria could be obtained.

Literature Review and Theoretical Framework

Lee, Chnug and Koo (2005) state the need for sustainability of the environment. For the environment to be sustainable, the society needs not only to limit the level of pollution, but also to improve the eco-efficiency of a society as a whole. It is essential to conserve the natural environment, however; the activities of man which are necessary for economic development continue to deplete this natural environment through Sulphur Dioxide (SO_2) emission into the air, irreversible damage to ecosystem or species owing to mining or forestry activities. It is important that these externalities be duly recognized, managed, and accounted for in the financial statements of corporate firms.

In the years past, both corporations and individuals often ignored environmental issues. The ecosystem has been degraded and depleted through pollution, wastewater, hazardous waste etc. In recent times, awareness of the effects of these waste products on the environment has increased (White, Becker & Goldstein, 1992).

Society has become increasingly concerned with the health of the natural environment

and the role of corporations in impacting ecosystems and human health. Regulations have been developed to govern waste management and to ensure that corporate firms are environmentally conscious. Government has created environmental protection agencies at both federal and state levels and now Ministries of Environment. Pressures are now on businesses and organizations to respond to public issues such as:- man-induced climatic change, which is, depletion of the ozone layer; earth, water and air; a need for recycling, and a need for a safe and clean environment (Reyes, n.d.)

At present, enterprises are confronted by many constraints and responsibilities in connection with environmental factor. Financial accounting does not identity environmental costs because these are aggregated together. There is evidence however that some environmental liabilities and risks that are in principle covered by reporting requirements are often not reported e.g. liabilities for cleaning up contaminated land (White et al, 1992). They added that comprehensive Environmental Management Accounting System would promote more complete financial accounts. The expected future costs for a necessary waste treatment plant upgrading should be part of the current budgeting cycle. Potential future liability claims and corporate image cost from poor environmental performance should be considered when comparing investment options.

The more materials flows and with the presence of environmental risks within an organization, the higher the potential value of an Environmental Management Accounting System to identify, compile, analyze and report environmental cost information in a timely and rigorous fashion. The existence of Environmental Management Accounting System is a prerequisite to understanding the source and magnitude of environmental costs in the firm.

An Overview of Relevant Environmental Theories

In this era of globalization and industrial development, there is strong interdependence between human development and the environment. Self-consciousness and intelligent management of the earth is one of the greatest challenges facing humanity. There is therefore the need for a new environmental ethic to meet these challenges.

Science and environmental policies are the most commonly accepted options for dealing with this crisis. The environmental crisis is primarily a consequence of human action. Therefore, there is the need to question the most fundamental values. This highlights the importance of ethical thinking in relations to the environmental crisis. The three main classes

of ethical theory are teleological, utilitarian and deontological. Environmental ethic is a topic in applied ethics which examines the moral basis of environmental responsibility. There are three primary theories of moral responsibility to the environment. These are anthropocentric, biocentric and ecocentric

Anthropocentrism

The anthropocentric theory is human-centered and expressed the view that all environmental responsibilities are derived from human interest alone. The assumption is that only human beings are morally significant persons and have a direct moral standing. Anthropocentrism or human-centeredness is believed by some to be the central problematic concept in environmental philosophy, where it is used to draw attention to a systematic bias in traditional western attitudes to the non-human world (Naess, 1973).

Biocentrism

The second theory of moral responsibility to the environment is biocentric. It is a life-centered theory, which states that all forms of life have an inherent right to exist. Biocentrism is most commonly defined as the belief that all forms of life are equally valuable and humanity is not the centre of existence. Biocentric positions generally advocates a focus on the well-being of all life in the consideration of ecological, political and economic issues. Animal rights theorist contends that if the suffering of all beings is minimized, then the environmental destruction will be appeased. They segregate living organisms into a hierarchy based upon moral criterion such as sentience or a basal level intelligence (Singer, 1990).

Ecocentrism

The theory of ecocentricism is more holistic in its approach, typically building upon the interdependence of each organism, species, community and ecosystem. It often see that acts of destruction against a specie have a ripple effect; affecting other symbiotic species and thus the stability of the entire biological community and ecosystem. The environment is considered to be in a moral par with humans

Corporate Environmental Ethics

Many tasks of industry, such as procuring raw materials, manufacturing and marketing,

and disposing of wastes, are in large part responsible for pollution. This is not because any industry or company has adopted pollution as a corporate policy. When raw materials are processed, some waste is inevitable. It is usually not possible to completely control the dispersal of all by-products of a manufacturing process. The cost of controlling waste can be very important in determining a company's profit margins.

Protecting the environment involves meeting the need of both current and future generations. Welford (1996) examines the various approaches to environmental policy to get businesses to improve their environmental performances, and how business itself influences that policy. These approaches according to him are: the free market approach and self-regulation; the reformist approach and financial incentives; and the interventionist approach and legislation

Understanding Environmental Costs

Environmental costs are generally defined narrowly. Environmental costs are those costs incurred in compliance with, or prevention of breach of, environmental laws, regulations and company policy. However, the true environmental costs to a firm can be far broader, including; costs of resources both those directly related to production and those involved in general business operations; waste treatment and disposal costs; the costs of poor environmental reputation; and the cost of paying an environmental risk premium.

White, Becker and Savage (1993), categorise environmental costs into two major dimensions. Those that directly impact on a company's bottom-line; they referred to as private costs. The other encompasses the cost to individuals, society, and the environment for which a company is not accountable; which they called societal cost. They can be classified as: Conventional Costs; Potentially Hidden Costs; Contingent Costs; and Image and Relationship Costs.

Why Environmental Accounting?

There are several reasons why businesses may consider adopting environmental accounting as part of their accounting system. As stated by Environmental Agency, UK, (2006), these include.

(i) Possible significant reduction or elimination of environmental costs.

(ii) Environmental costs and benefits may be over looked or hidden in overhead accounts.

(iii) Improved environmental performance which may have a positive impact on human health and business success.

(iv) May result in more accurate costing or pricing of products and more environmentally desired processes.

(v) Possible competitive advantages as customers may prefer environmentally friendly products and services.

The Need for Environmental Reporting

There has been a growing recognition of the importance of transparency for economic growth and social development. Also, there have been calls from civil society and a broader range of stakeholders for greater transparency and accountability to aid decision-making (PR News Wire Association LLC, 1996-2007).

In Nigeria, an initiative encouraging transparency which can help strengthen reporting in the extractive industry sectors is Nigeria Extractive Industries Transparency Initiative (NEITI) launched in February, 2004. While substantial efforts have already been undertaken in the reporting area, continued action is necessary to strengthen transparency. It is essential that environment accounting reporting should be given a pride of place, as it is relevant to Risk Management, Government, Legal Needs, Accounting Requirements, Competition, Communities, Certification Need, Investors' interest, Contractors and Environmental Groups. If environmental accounting is the enabling vehicle to form a common basis for the users of the environment; both internal and external; the effective vehicle is environmental reporting (Dorweiler & Yakhou, 2002).

Applicability of Environmental Accounting

Towards the attainment of corporate goal of wealth maximization of a firm, environmental accounting should be applied in its operations - cost allocation, capital budgeting and process/product design. Numerous observers have recognized the complexity, consequences and necessity of rationalizing accounting systems to ensure proper allocation of costs to the sources within the firms that are responsible for such costs (Cooper et al, 1992; Johnson & Kaplan, 1991; Ness & Cucuzza, 1995; Todd, 1994).

Through the application of environmental accounting; management in particular, and other concerned stakeholders can identify environmental cost. Hence, they are motivated to

find ways of reducing or avoiding those costs while at the same time improving environmental quality. This is the conceptual cornerstone of Activity Based Costing, (Schaltegger & Muller, 1997).

It may be easier to include environmental cost in capital budgeting, if existing processes; system and products are already being assigned environmental costs in cost accounting systems. Integrating environmental accounting into capital budgeting involves:

- Quantifying environmental costs
- Allocating and projecting environmental costs and benefits
- Using appropriate financial indicators
- Setting reasonable time horizon that captures environmental benefits.

The design of a process or product would certainly have significant impact on environmental costs and performance. Hence, many companies are adopting *"Life cycle design"* programmes to take environmental considerations into account at an early stage.

Main Environmental Laws in Nigeria

The main environmental laws in Nigeria include:

(a) The National Effluent Limitation Regulation S.1.8 of 1991, which makes it mandatory for industrial facilities to install anti-pollution equipment.

(b) The Pollution Abatement in Industries and Facilities Generating Wastes- Regulations S.1.9, of 1999, which among other things impose restriction on the release of toxic substances and stipulates requirements for monitoring of pollution; to ensure that permissible limits are not exceeded as well as spelling out generator's liability.

(c) The Solid and Hazardous Waste Management Regulation S.1.15 of 1991, which regulates the collection, treatment and disposal of solid and hazardous waste from municipal and industrial sources. The regulation also provides a list of over 1000 hazardous chemicals to be controlled by FEPA by toxicity category

(d) The Harmful Wastes (Criminal Provisions) Act 42 of 1988, which sentences individuals who trade, dispose, or transport toxic waste in Nigeria or its Exclusive Economic Zone to life imprisonment. Koko toxic dump in Delta State in 1988 gave rise to this Act.

(e) The Environmental Impact Assessment (EIA) Act 86 of 1992, which provides the

procedure for conducting an EIA of any major development. The sectoral guidelines for the EIA Act have now being developed for oil and gas, mining, agricultural, manufacturing and infrastructure sectors.

(f) The Sea Fisheries and Inland Fisheries Act, 1992, which control access to fisheries resources. The Act includes wide provisions for the regulation of catch species, sizes and fishing zones. The regulation sets minimum net size for both finfish and shrimp.

(g) Federal Environmental Protection Agency (FEPA) Act, No. 58 of 1988. The Act specifies establishment, membership, functions and powers of the Federal Environmental Protection Agency and National Environmental Standards. In 2007, the National Environmental Standards and Regulations Enforcement Agency (NESREA) Act repealed the FEPA Act. NESREA has amongst other functions the power to enforce compliance with laws, guidelines, policies and standards on environmental matters. According to Barrentt and Graddy (2000), an improved environmental regulation resulting from appropriate political institutions is likely to improve environmental sustainability. The worries are how effective has the Agency been in the enforcement of compliance and also of note is the lack of jurisdiction over environmental matters emanating from the Oil and Gas sector.

Global Reporting Initiative (GRI) Guidelines

Society has become increasingly concerned with the health of the natural environment and the role of corporations in impacting ecosystems and human health. Investors are calling for the use of the Global Reporting Initiative by companies to improve their public disclosure to shareholders on pressing environmental and social issues.

Global reporting initiative is designed to provide investors with complete, transparent and consistent reporting from companies on a broad range of social and environmental issues. The core principles of global initiative reporting frameworks are transparency, inclusiveness, "auditability", completeness and relevance. Others are context, accuracy, neutrality, comparability, clarity and timeliness. The important role that the guidelines play in driving transparency, balance, continuous improvement and accountability across sustainability reporting cannot be overemphasized. Nigerian corporate firms must be up and doing, to help investors understand the environmental and social threats they face, whether from climate change risks, resources challenges or workplace conditions.

Data Analysis and Discussion of Results

The underlying objective of this paper is to assess how government legislations promote or impede improved environmental accounting practice, while comparing current practices across firms of different types. Various types of financial costs included in environmental project financial evaluation were considered to identify the degree of consensus among various firms regarding the relative importance of each of the financial costs items.

In determining the influence of compliance with Nigerian laws on environmental accounting practice, the degree of consensus among the respondents was evaluated by the mean ranking of their responses in ascending order; the lowest ranked 1 and the highest rank for the highest values. The ranking statistic – Kendall's Coefficient of Concordance suggested by Siegel (1956) was employed since it is a simultaneous test for relationships between multiple cases. This test is often used for expressing inter-rater agreement among independent judges who are rating (ranking) the same stimuli.

However, most texts do not provide adequate information or tables to enhance the use of Kendall's Coefficient of Concordance (W) as a test-statistic. Hence, the significance of any value of W was evaluated by Chi-square (χ^2) at 5% level of significance and n-1 degrees of freedom was used to derive the index of consensus.

According to Gibbons (1976), the test-statistic can be measured as

$$\chi^2 = K(n-1)\,W$$

$$\text{or } W = \frac{12D}{K^2\, n(n^2-1)}$$

$$\text{given that } D = \sum_{j-1}^{n} \left(Rj - K\,\frac{(n+1)}{2} \right)^2 \quad \text{or} \quad \sum_{j-1}^{n} (R_j - R)^2$$

where;

n = the number of respondents

K = the number of objects ranking the factors

D = sum of squares of the observe deviations from the rank mean

R_j = mean ranking

R = sum of ranks assigned to the n's

When there is a perfect disagreement W =0, while W =1 shows a perfect agreement.

The Chi-square (χ^2) statistic was used to evaluates the perception of respondents whether or not environmental accounting is significant in benchmarking standard for corporate reporting.

The study shows that of the 25 sampled companies, 88% have Environmental Management System (EMS) in place while 84% of the sampled firms have their environmental costs quantified. The implication is that some of the companies have near to non-functional EMS. Forty-four (44%) of the quantified costs are tracked at the plant level, 35% and 21% at corporate and divisional levels respectively.

Table 1: ***Types of financial costs included in environmental project financial evaluation***

S/N		**No. of Respondents**	**Percentage (%)**
i.	On-site air/waste water/hazardous waste testing/ monitoring	288	79
ii.	On-site air/waste water/hazardous waste treatment/ disposal/control	259	71
iii.	Manifesting for off-site hazardous waste transport	215	59
iv.	Off-site hazardous waste/waste water treatment	183	50
v.	Energy costs	285	78
vi.	Water costs	270	74
vii.	Licensing/permitting	274	75
viii	Reporting to government agencies	190	52
ix.	Environmental penalties/fines	208	57
x.	Staff training for environmental compliance	267	73
xi.	Environmental staff labour time	139	38
xii.	Legal staff labour time	102	28
xiii	Natural resources damages	117	32
xiv	Employee safety/health compensation claims	288	79

Source: Field survey 2013.

Table 1 shows the various types of financial costs included in environmental project financial evaluation. Evidence contained in the table suggests that On-site air/ waste water/ hazardous waste testing/ monitoring and Employee safety/ health compensation claims were the most important internal costs included in environmental project financial evaluation as

indicated by 79% of the respondents. However, the least used internal costs are legal staff labour time (28%) and natural resources damages (32%). Of the companies that quantifies environmental costs, 67% indicate that the cost is always/usually assigned to overhead; while 18% stated that they are always/ usually to product/process; 15% indicated that they are left in the pool of costs.

The study revealed that 34% of the respondents indicated that the production/operation staff develops cost estimates for environmental projects, environmental staff 30%; financial/accounting staff 26%; and consultants 10%. Sixty-seven percent (67%) of the companies indicated that screening/evaluation of environmental project is done prior to detailed financial analysis. In evaluating the opinion of respondents on the relevance of environmental costs accounting in corporate reporting, the responses as indicated in table 2 are analysed using Chi-square (χ^2).

Table 2: ***Relevance of Environmental Accounting in corporate reporting***

Responses	**No of respondents**
Strongly agree	169
Agree	48
Undecided	87
Disagree	109
Strongly disagree	22
Total	435

Source: Field survey 2013.

At 5% level of significance and degree of freedom of 4, the computed $\chi^2 = 148.89$ is greater than the critical value $\chi^2_{0.05} = 9.48773$; hence the hypothesis (**H_{01}**) that environmental accounting is not significant in benchmarking standard for corporate reporting is rejected.

Table 3: ***The influence of legislation on corporate environmental accounting practice***.

Sectors	+VE	No impact	-VE	Mean			Ranking			Sum
				+VE	No impact	-VE	+VE	No impact	-VE	
Agro-Allied	14	14	7	0.4	0.4	0.2	5	8	7	20
Automobile & Tyre	11	16	8	0.31	0.46	0.23	2	11	8	21
Breweries	22	9	4	0.63	0.26	0.11	9	5	6	20
Building Materials	12	10	8	0.4	0.33	0.23	5	7	8	20
Chemical & Paints	18	15	2	0.51	0.43	0.06	8	9	2	19
Conglomerates	13	14	3	0.43	0.47	0.09	7	12	4	23
Food & Beverage & Tobacco	38	9	3	0.76	0.18	0.06	12	3	2	17
Health Care	26	12	2	0.65	0.3	0.05	10	6	1	17
Industrial/Domestic product	11	6	18	0.31	0.17	0.51		2	11	15
Petroleum	26	10	4	0.65	0.25	0.10	10	4	5	19
Printing & Publishing	10	5	20	0.29	0.14	0.57	1	1	12	14
Textile	12	15	8	0.34	0.43	0.23	4	9	8	21
Total	213	135	87							
Column mean	1775	11.25	7.25							
Grand mean	12.08									

Source: Field survey 2013 & Authors, computations.

From table 3, D = 622.96; W = 0.484 and χ^2 = 15.972. The computed χ^2 is lesser than critical χ^2= 33.9244 at 5% significant level, hence the hypothesis (**H_{02}**) that the compliance with Nigerian environmental protection laws has no significant influence on environmental accounting practice is accepted.

A close look at the income statements of the sampled companies showed general statements on Employee Health and Safety (EHS) and list of community development project donations and charitable gift where applicable. There were no sufficient details of integration of environmental issues into their accounting metrics.

Society has high expectation from corporate firms in respect of environmental performance. As pressures to curb industrial pollution mount, more and more companies will find themselves considering investment projects that have both business and environmental benefits. Proactive managers are constantly on the look out for business-oriented solutions to their environmental challenges.

Environmental accounting offers a powerful measurement tool to concretely present the financial returns of proposed environmental-friendly investment. It offers an interesting view of corporate environmental practice and its relation to the profit objective; by providing a gateway by which the often hidden environmentally-related costs can enter the financial decision-making process. Environmental accounting can positively change the perception and behaviour of managers, owners, and financiers towards environmental improvement project.

Firms should endeavour to evaluate environmental project, prior to detailed financial analysis. Environmental accounting must become part of strategic planning and capital budgeting exercise. This means infusing core business thinking with accurate perceptions of environmental costs. Environmental accounting is extensive. Companies should endeavour to adopt the practice.

Summary and Conclusions

This paper attempts at assessing environmental accounting practices in Nigeria; an emerging economy of the world. Nigeria continues to suffer the detrimental effect on marine life and human health from water and air pollution. The government has indicated a desire to change this situation, and in recent years has taken measures to effect this change by promoting the performance of environmental risk assessment prior to project initiation.

The issues have been that of compliance and enforcement and of creating accounting systems that will allow both firms and their stakeholders (investors, customers, environmental organization, host communities) a clear perspective on the total environmental effect of a company.

Basically, this study compared practice by firms in the various sector of economy and assessed how government legislations promote or impede improved environmental accounting practice. The results of the findings indicate that environmental accounting practice is significant in benchmarking standard for corporate reporting. It was also revealed that the compliance with Nigerian environmental protection laws has not had significant influence on environmental accounting practice by corporate firms in the country.

The study revealed that the input of plant environmental staff is important in cost categorization and tracking of cost in developing an environmental management system. It was discovered that legal staff labour time and natural resources damages are the least internal costs

included in environmental project financial evaluation. It has been established in this study that the establishment of an Environmental Management System (EMS) is an essential for corporate firms in Nigeria. This is an important task to ensure that all relevant, significant costs are considered when making business decisions.

Arising from this study the following recommendations are put forward in order to promote the practice of environmental accounting by corporate firms and to enhance the benefits derived there from.

i. External impact costs should also be accorded importance and given the required attention. The least used internal costs such as natural resources damages and legal staff labour hour if given the required attention will reduce friction between the companies and their host communities.

ii. The practice of assigning environmental cost always to overhead is not the best practice. However, environmental cost should be duly allocated to products and processes to enable managers know the true costs and benefits of retaining or changing processes and product; and for appropriate pricing decisions. Costs should be traced systematically and attributed to the responsible processes and products instead of being summed up in general overhead.

iii. Government should step-up its enlightenment programme on policies and laws on environmental protection in order to increase awareness amongst corporations operating in the country. Also, the relevant agencies should ensure enforcement of and compliance with these policies and laws.

iv. Companies should endeavour to make use of environmental cost and performance information for designing environmentally preferable processes/products. This will result in improved profitability and a reduction in environmental risk.

v. Accounting professionals need to be trained in environmental accounting methods, and have appropriate guidelines to follow. Hence, the Nigerian Accounting Standards Board (NASB); now Financial Reporting Council (FRC) should think of having an accounting standard that will have a framework to extend practices to include costing and methods of pollution control; comparing alternative materials to be used, investigating possible recycling alternatives etc.

Suggestions for further research

Environmental accounting is an emerging and contemporary field relevant in these days of debates on global environmental/climatic changes and control. Further research in the field of accounting should look at:

(i) link between environmental accounting practices and firm performance; and

(ii) the link between Environmental accounting practices and corporate governance issues.

References

Akers, M. D. & Grover, L.P. (1995). Strategic planning at five World-Class companies. *Management Accounting* July, pp.7-11.

Barrett, S. & Graddy, K. (2000). Freedom, growth and the environment. *Environment and Development Economics*, Vol. 5 pp 433-456.

Cooper, R; Kaplan, R. S; Miasel, L; Morrissey, E. & Oehm, R. M. (1992**).** *Implementation Activity Based Cost Management: Moving from Analysis to Action'*, Montvale, N. J. Institute of New Jersey.

Daferighe, E. E. & Aje, S. O. (2005). Management of environmental accounting system. *International Journal of Economic and Development Issues* Vol.5, No 1&2, pp.204-213.

Dorweiler, V.P. & Yakhou, M. (2002). Dimensionality of environmental accounting. *Journal of Accounting and Finance Research*, Vol. 19(4) PP 47-64.

Daryl, D., Ranganathan, J. & Banks, D. (1995). *Green Ledgers: Case studies in Corporate Environmental Accounting*, Washington DC. World Resources Institute.

Enger, E. D. & Smith, B. F. (2000). *Environmental science: A study of interrelationships.* 7th ed.

513 Environmental Agency UK (2006). Glossary of Terminology and Definitions. Retrieved on
514 2006-05-25.

515 Gibbons, J. D. (1976**).** *Non-parametric methods for quantitative analysis*. New York: Holt,
516 Rinehart and Winston.

517 Gray, R.H. (1993). *Accounting for the environment,* New York Merkus. Weiner Publishing Inc.

518 Johnson, H. & Kaplan, R. (1991**).** *Relevance lost: The rise and fall of Management*
519 *Accounting*, Boston, MA; Harvard Business School Press.

520 Lee, H; Chung, R.K. & Koo, C. M. (2005). On the relationship between economic growth and
521 environmental sustainability. A paper presented at the Eminent Environmental
522 Economists symposium in the 5th Ministerial Conference on Environment and
523 Development in Asia and the Paciufic, Seoul, Korea.

524 Leopold, A. (1966). *Land ethic, from the Sand Country Almanac*. New York: Balantine.

525 MacLean, R. & Rappaport, A. (1998). Environmental Accounting for competitive advantage.
526 In *Environmental Management and Business Strategy. Leadership Skills for the 21st.*
527 *Century* USA, John Wiley & Sons. pp.107-118.

528 Naess, A. (1973**).** The Shallow and the Deep: Long-range ecology movement. *Inquiry* 16:
529 Pp.95-100.

530 Ness, J. A. & Cucuzza, T. G. (1995**).** Tapping the full potential of ABC. *Harvard Business*
531 *Review*, July – August, pp.130-138.

532 Popoff, F. & Buzzelli, D. (1993**).** Full Cost Accounting. *Chemical and Engineering News* Vol.
533 71, No 2, pp 8-10.

534 PR News Wire Association LLC (1996-2007**).** Investor Press S. & P 500 Companies for better
535 Disclosure on Environmental and Social Challenges.

536 Reyes, M. F. (n.d). Environmental Management Accounting: A business driver for green
537 productivity investments. Retrieved 2006-05-25 from http://eman-ap.net.

538 Schaltagger, S. & and Muller, K. (1997**).** Environmental Management Accounting current
539 practice and future geographic focus: Global. Calculating the true profitability of
540 pollution prevention, *Greener Management International* GMI, p.17.

541 Siegel, S. (1956). *Non-parametric statistics for the behavioural sciences.* New York: McGraw
542 Hill.

543 Singer, P. (1990). *All Animals are equal: Animal liberation In Berbara MacKinnon.* Belmont:
544 Wadsworth Publishing Company.

Todd, R. (1994). Zero loss environmental accounting systems. In Allenby, B. R. & Richards, D. J. (eds), *The Greening of Industrial Ecosystem*, Washington D.C National Academy Press. pp.191-200.

Welford, R. (1996). Business and environmental policies. In Blowers, A. & Glasbergen, P. (eds) *Environmental Policy in an International Context: Prospects for Environmental Change* (pp.51-77), London, Arnold of Hodder Headline Group.

White, A., Savage, D. & Brody, J. (1995*). Environmental cost accounting for capital budgeting: A Benchmark Survey of Management Accountants* U.S.A, EPA.

White, A.; Becker, M. & Savage, D. S. (1993**).** Environmental smart accounting using total cost assessment to advance pollution prevention. *Pollution Prevention Reviews.* pp. 247-259.

White, A; Becker, M. & Goldstein, J. (1992). *Total cost assessment: Accelerating industrial pollution prevention through innovative project financial analysis.* USA: Boston, EPA.