LEGITIMACY FOR ACCOUNTING FOR ENVIRONMENTAL DEGRADATION AND POLLUTION

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Abstract

The responsibility of care for natural resource is the owners of natural resource and all stakeholders including the duty of general care to all. Responsibility of care is with the view of minimizing adverse impact of degradation on the natural environment. It is also with the view of mitigating the degradation impact aimed at avoidance of potential contingent costs liability. This study has reviewed theory for the legitimacy for environmental accountability such as The United Nations' Protocols and agreements on environment and the Kyoto Convention. The study also reviewed the Eco-efficiency framework and models for environmental accounting. Policy recommendations are proffered on corporate governance with respect to effective natural environment responsiveness and accountability towards avoidance of environment contingent costs and liabilities which are encountered by organizations.

Keywords: Kyoto Convention, environmental accountability, environment contingent costs and liabilities, eco-efficiency, statutory environmental disclosure

Introduction

There are increasing policies and environmental laws based on the concept of sustainability in global societies. These laws express legal obligations to incorporate concern for the preservation of environment and natural resources, failure which attracts prosecutions and sometimes consequential losses to corporate organizations. Liability is incurred if there is an impact on the environment (air, water, soil) coming from individuals or corporate organizations. Liability is incurred when damages caused result in human death, bodily injury

or damage to property or the general environment. In most parts of the world and in Nigeria, the environment has been used as a medium for disposing of every kind of fluid and solid waste. It is assumed that the aquatic, atmospheric and terrestrial environments are capable of performing tremendous scavenging, assimilating and dispersing functions. Environmental studies have revealed that the environment is not capable of absorbing all residuals as neutralizing capacity of the natural environment can be overburdened.

Industrial economic activities have great responsibility to ensure eco-efficiency through effective and efficient utilization of the natural resources. Eco-efficiency and environmental accounting presuppose that efficient economic productivity can be achieved while preserving the natural environment bio-diversity through efficient utilization of water, energy and all environmental activities without degradation. According to the US Environmental Protection Agency (1995a), environmental accounting also known as green accounting, a tool for accountability is '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'. In the opinion of Howes (2002) environmental accounting entails the generation, analysis and use of monetarized environmentally related information to improve corporate environmental and economic performance. This concept links environmental and financial performance more visibly. It is aimed at 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, contingent liabilities and business risks and to add value, not only to the organization but also to the bio-diversity environment. It is the objective of this paper to explore statutory requirements and legitimacy for the accountability for the natural environment.

The approach in this discus is subdivided into parts: the first part constitutes introduction, the second part is review of literature on legitimacy of environmental accountability, eco-efficiency framework and environmental accounting models. The study also reviewed the environmental institution and policy standards in Nigeria, and the final part conveys the conclusion and policy matters on the study.

1.0 Extant literature

1.1 The united nations protocols and agreements on environment

The issue of the environment has featured severally over the years at world conventions under the auspices of the United Nations Environmental Programme Wikipedia, (2007) such as:

1. The International Convention for the prevention of pollution from ships, in 1973 and 1978 but enforced in 1983
2. The Montreal Protocol on substances that deplete the ozone layer in 1987 and enforced in 1989
3. IMO resolution A 672 (16); International Maritime Organization (1989)
4. The Basel Convention (1989)
5. The Bamako Convention (1991) at the African regional level.
6. International Tropical Timber Agreement in 1994
7. The UN Framework Convention on Climatic Change in 1992 (Adopted in December, 1997)
8. Ottawa Convention on landmines in 1997
9. ASEAN Agreement on Trans-boundary haze pollution in 2002.

Follow-up to the Montreal Protocol on substances that deplete the ozone layer, adopted in Montreal in 1987, the Kyoto Protocol was adopted in December 1997 according to the Crown Copyright Treaty Series 6 (2005) centre on climate change and implication. The protocol has provided among others in Article 3 which reads in parts:

1. The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts…
2. Each Party included in Annex 2 shall, by 2005, have made demonstrable progress in achieving its commitments under this Protocol.

Some important commitments under Article 2 Sec 1a are that:

Each Party included in Annex 1, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development shall:

a.) Implement and/or further elaborate policies and measures in accordance with national circumstances such as:

(i) Enhancement of energy efficiency in relevant sectors of the national economy;

(ii) Protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol, taking into account its commitments under relevant international environmental agreements; promotion of sustainable forest management practices, a forestation and reforestation;

(iii) Promotion of sustainable forms of agriculture in light of climate change considerations.

Contained in a Press Release in December, 2004, the International Accounting Standards Board, IASB IFRIC (2004:3) states that:

> In the light of the Kyoto Protocol, several governments have, or are in the process of developing schemes to encourage reductions in greenhouse gas emissions. The Interpretation focuses on the accounting to be adopted by participants in a 'cap and trade' scheme, although some of its requirements might be relevant to other schemes that are also designed to encourage reduced levels of emissions and share some of the features of a cap and trade scheme.

According to IASB IFRIC (2004), in cap and trade schemes, a government (or government agency) issues rights (allowances) to participating entities to emit a specified level of emissions. The government may issue the allowances free of charge or the participant may be required to pay for them. Participants in the scheme are able to buy and sell allowances and therefore, in many schemes, there is an active market for the allowances. At the end of a specified period, participants are required to deliver allowances equal to their actual emissions.

1.2, EU Directive on environmental issues in company annual reports and financial statements

As contained in Environmental Management Accounting, IFAC (2005:79), the European Commission in 2001, adopted a recommendation on recognition, measurement and disclosure of environmental issues in the annual accounts and reports of companies. This recommendation was to enable for reporting of high levels of environmental issues in annual accounts and reports of companies. Although EC recommendations were voluntary, but

European Countries in 2003, have made the reporting of environmental issues in annual accounts and reports mandatory.

According to EMA in IFAC (2005:79), Green Accounting in Denmark requires EMA material accounting in companies. Companies therefore, require in their reports data on consumption of water, energy and raw materials, significant types and volumes of pollutants emitted to air, water and soil, and significant types and volumes of pollutants in production processes, waste or products.

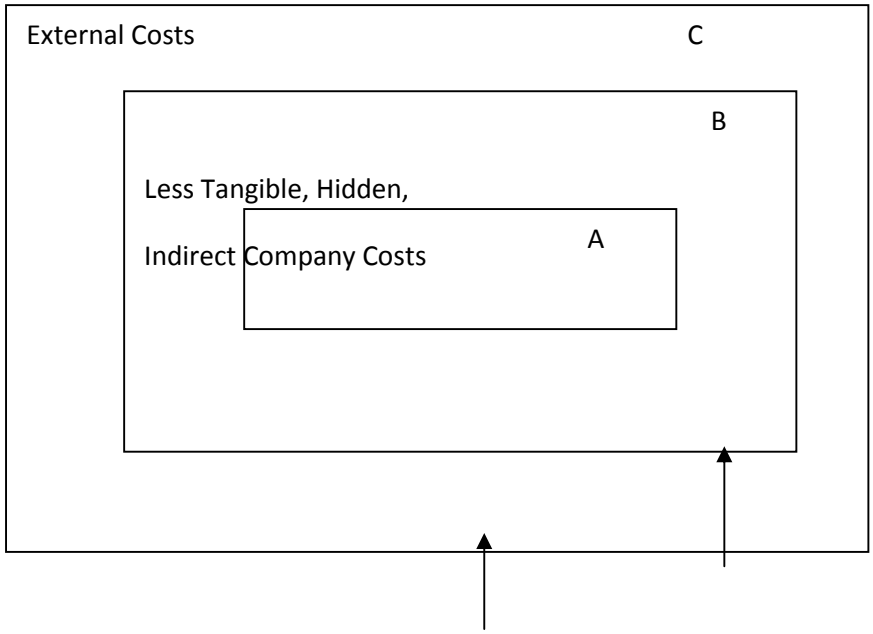
In Denmark, green accounting and corporate reporting environmental issues are increasingly pursued. The Enterprise Act of 1989 in Norway requires that Board of Directors' Report should include information on the levels of pollution emission, contamination and details on the measures undertaken or planned in the pollution prevention activity (Roberts, 1992; Salomone and Gallucio 2001:22).

The legitimacy for the accountability for environmental degradation, pollution and prevention or mitigation therefore, behoves us for an attempt an exploration for models for recognizing environmental costs and dealing with them.

1.3 Environmental cost primer model

GEMI (Global Environmental Management Initiative - 1994), and Savage, Brody, Cavander and Lach in U.S EPA (1995c) propose the Environmental Cost Primer Model - Cost Boundaries as in Figure 1. In order to provide guide for integrating environmental costs considerations into decisions on environmental projects, an attempt on costs delineations is made. Represented in Figure 1 (diagram), Box A comprises of conventional costs such as off-site waste disposal, purchase and maintenance of air emission control systems, utilities costs and perhaps costs associated with permitting of air or wastewater discharges. Box B comprises of wide-range of costs (also of savings and revenues) such as: liability, future regulatory compliance, enhanced position in green product markets, and the economic consequences of changes in corporate image linked to environmental performance.

Figure 1: The GEMI environmental cost primer model – cost boundaries



Source: Adapted U.S.EPA and Tellus Institute (1995c:21); Environmental Cost Accounting For Capital Budgeting: A Benchmark Survey of Management Accountants, June.

Both Boxes A and B comprise the company's Internal Costs which are also called Private Costs for which the company is held responsible since consequences of costs affect company profitability performance bottom-line. Box C comprise of External Costs which are also called Externalities or Societal Costs such as adverse health effects for air emissions, damage to buildings or crops resulting from SO_2 and irreversible damage to the ecosystem. Environmental Externalities costs in Box C are those which the company is not accountable for. Table 1 of environmental costs identifiable and segregated as contained in the U.S. Environmental Protection Agency (1995b) should be read alongside with the Figure 1 Cost Primer Model.

Concept of best practices in industrial production forms the fundamental basis for environmental accounting advocacy. The concept of Environmental Accounting (EA) requires a segregation of costs which are identifiable with environment pollution, degradation, detection, prevention and remediation. In AT&T Green Accounting, it is defined as the identifying and measuring of the costs of environmental materials and activities and using this information for environmental management decisions. Pertinent of these costs are critical 'hidden', 'private' and 'externality' costs and the purpose is for environmental costs reduction, waste avoidance, increase in usage and recycling of wastes and environmental remediation.

Effective environmental costs identification, classification and reporting will give added objectivity to financial statements for decision making. Also, budgeting and effective budgetary control of environmental costs will allow for effective and efficient management of environmental costs control.

Environmental costs are subject to varied specifications and definitions. In the work of Shield, Beloff and Heller (1996), the term was often used to refer to costs incurred in order to comply with regulatory standards. Also, costs which have been incurred in order to reduce or eliminate releases of hazardous substances and all other costs associated with corporate practices aimed at reducing environmental impacts.

How a company defines an environmental cost depends on how the information is to be utilized, for example: cost allocation, capital budgeting, process or product design or other management decisions. Accordingly, it may not be clear what costs are environmental or not as some may fall into gray areas. That means that some costs may be classified as partly environmental and partly non-environmental (GEMI 1994; Fagg et al 1993). Identifying environmental costs has resulted in applicable terminologies such as Full Costs, Total Costs, True Costs, Life Cycle Costs and other descriptive costs, all in an attempt to emphasize the inadequacy of conventional approaches because they have not accorded recognition to environmental costs.

Whereas, traditional costs classifications in accounting are:

1) Direct materials and labour, 2) Manufacturing or factory overheads, i.e. operating costs other than direct material and labour, 3) Sales overheads, 4) General and Administrative (G &A), and 5) Research and Development (R&D)

The U.S EPA (1989; 1995b:9; 1995c:21) and GEMI (1994) Environmental Cost Primer model (Figure 1) has segregated costs into direct costs, and distinguished costs which may be obscure through treatment as overheads, hidden, contingent, liability or less tangible costs. Examples of costs have been categorized into basic costs as in Table 1

Costs already recognized as conventional, such as costs of raw materials, supplies, capital goods and utilities are usually addressed in cost accounting but not necessarily as environmental costs. It is a truism that a decrease in the usage and less waste of raw material, supplies and non-renewable resources reduce environmental degradation and more environmental preference. These are important issues for internal decision making in management.

Table 1: Environmental Costs in Firms

1. **Potential Hidden Costs**		
Regulatory	Upfront	Voluntary (Beyond compliance)
Notification	Site studies	Community relations/
Reporting	Site preparation	outreach
Monitoring/Testing	Permitting	Monitoring/testing
Studies/Modeling	R & D	Training
Remediation	Engineering and	Audits
Record keeping	procurement	Qualifying supplies
Plans	Installation	reports e.g., annual
Training		environmental reports)
Inspections	2. **Conventional Costs**	Insurance

Manifesting	Capital equipment	Planning
Labeling	Materials	Feasibility studies
Preparedness	Labour	Remediation
Protective equipment	Supplies	Recycling
Medical surveillance	Utilities	Environmental studies
Environmental	Structures	R & D
Insurance	Salvage values	Habitat and wetland
Financial assurance		protection
Pollution control	Back-End	Landscaping
Spill response	Closure/	Other environmental
Storm water	decommissioning	projects
Management	Disposal inventory	Financial support to
Waste management	Post-closure care	environmental groups
Taxes/fees	Site surveys	and/or researchers

3. **Contingent Costs**

Future compliance costs	Remediation	Legal expenses
Penalties/fees	Property damage	Natural resource
Resource to future	Personal injury	damages
releases	damage	Economic loss
		Damages

4. **Image and Relationship Costs**

Corporate image	Relationship with	Relationship with
Relationship with	professional staff	lenders
customers	Relationship with	Relationship with
Relationship with	workers	host communities
investors	Relationship with	Relationship with
Relationship with insurers	suppliers	regulators

Source: U.S EPA (1995b:9). An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms, Office of Pollution Prevention and Toxics, June.

Table 1 indicates a list of potentially hidden costs which comprise a list of environmental costs, hidden costs which are upfront environmental costs which are incurred prior to the operation of a process, product or facility. These also include costs such as those relating to facility site, design of process, product or facility. Hidden costs may also constitute costs emanating from regulatory requirement such as remediation, monitoring and testing, inspections, and insurance among others. Environmental costs also consists voluntary costs such as those which go beyond compliance to statutory requirement, such as community relationship, insurance and feasibility studies. Back-end environmental costs, quite unlike the upfront costs and others which may be obscured and unfairly allocated, may not be entered into records at all. These are future costs such as cost of decommissioning of process, closing a landfill to meet with regulatory requirement.

Contingent costs may not receive the attention of management because they constitute accidental environmental costs, which may or not be incurred in the future. These may include fines, costs for remedying or compensation for future releases of contaminants. Contingent costs are regarded as contingent liabilities. Image and relationship costs are regarded as less tangible or intangible as they are incurred to affect the perception of management for relationship and the image of the corporate company. These include costs on relationship to community, customers, the internal workers and the regulators.

On further cost categories, International Guidance Document on Environmental Management Accounting prescribes environment related costs in line with both internationally accepted and emerging best practices. (IFAC 2005:37). Materials costs of product outputs include the purchase costs of natural resources such as water and other materials that are converted into products, by-products and packaging. Examples are raw and auxiliary materials, packaging materials and water. Materials costs of non-product outputs include the purchase (and sometimes processing) costs of energy, water and other materials that become non-product output (waste and emissions); such as raw and auxiliary materials, packaging materials, operating materials, water, energy and processing costs. Waste and emission control costs include costs for handling, treatment and disposal of waste and emissions, remediation and compensation costs related to environmental damage; and any control related regulatory compliance costs; such as equipment depreciation, operating materials, water and energy, internal personnel, external services, fees, taxes and permits, fines, insurance and remediation and compensation**.** Prevention and other environmental management costs include the costs of preventive environmental management activities such as cleaner production projects. These also include costs for other environmental management activities such as environmental planning and systems, environmental measurement, environmental communication and other relevant activities. Examples are equipment depreciation, operating materials, water, energy, internal personnel and external services. Research and Development costs are costs for research and development projects related to environmental issues. Conclusively, less tangible costs by categorization comprise both internal and external costs related to less tangible issues such as liability, future regulations, productivity, company image, stakeholder relations and externalities.

1.3.1 Gaps of Environmental Cost Primer Model

There are watertight definitions of costs classification, such as ‘hidden costs’, ‘contingent costs’ and ‘image and relationship costs’. These definitions do not seem realistic as what is hidden costs to one cost identifier may not be so with another. There is also the tendency for double accounting for same costs which may be rightly classified as production and environmental costs. An existing gap is the non-reporting of the environmental costs along the identifiable costs segregations. Besides are the non-agreeable standards on environmental accounting at the moment. Considering observable gaps levied against the environmental costs primer, we also explore the costs benefit model.

1.4 The cost benefit model

Cost Benefit Analysis (CBA) is a technique to identify all costs as compared to all benefits which result from particular courses of action. Many are of the opinion that Cost Benefit Analysis model is more broadly applicable to all environmental resources and environmental decisions. For instance in protecting endangered species, it will be required to provide estimates of all costs and the benefits to be derived in carrying out the actions of preserving the endangered species.

Cost Benefit Analysis in carrying out projects and programmes in the public sector is analogous to commercial or economic feasibility study in a profit organization. What is being explored is social feasibility rather than commercial feasibility in which values of all marketable and non-marketable inputs and outputs are estimated. Two ways of determining Costs-Benefits are:

1. Net benefits which are Total Benefits less Total Costs (Values discounted)

$$NBd = TBd - TCd \quad (1)$$

OR

2. Cost Benefit Ratio $= \frac{TBd}{TCd}$ (2)

where NBd = Net Benefits discounted

TBd = Total Benefits discounted, and

TCd = Total Costs discounted

Cost Benefit Analysis for Environmental Accounting has been prominent with both the public and private sectors of the socio-economy. The environmental impacts are identified and measured and then translated into monetary terms. The major environmental losses are identified and fully estimated for as much as it is feasible. Subsequently, net present values relative to varied discount factors are estimated for purpose of decision making. Santhakumar and Chakraborty (2003:313); and Alberini, Rosato, and Turvani, (2006:xi) opine that Cost Benefit Analysis basis has been prominent for purpose of Environmental

Accounting. The assertion of the methodology is buttressed by varied authorities in literature. It is also agreeable that in the developing countries, the discounting methods for evaluation have also been in use which is also prominent in Nigeria.

According to Alberini, Rosato, and Turvani, (2006) factors for costing among others, and benefits estimated are:Direct costs paid in monetary terms for environmental management such as compensatory afforestation, catchment area treatment, rehabilitation, environment safeguard and monitoring. Others are losses due to submergence of forest land,. minor forest products (MFP), reed, this is the estimated loss of reed, fishing, hunting and tourism, erosion control and water retention,.carbon sequestration,. Nutrient retention and micro-climate stabilization, wild life habitat, depository of bio-diversity, losses due to dislocation of human settlements, impact on the downstream of the river, cost of protection against reservoir induced seismic activity (RIS), cost of controlling extensive deforestation and the direct and indirect benefits of the project

To estimate the value of benefits, it is necessary to find out how much people are willing to pay for those benefits. The challenge posed by valuation of non-marketable benefits requires valuation methods which circumvent regular market valuation methods. Alberini, Rosato and Turvani (2006:xii) agree that two acceptable methods of such valuation are the Travel Cost Method and the Contingent Valuation method. According to the authors, Travel Cost Method "uses actual visits to a resource, and the cost of travelling to and spending time at this resource, to estimate a demand function, from which it is possible to compute an individual's Willingness To Pay (WTP) for access to the resource and for improving its environmental quality". Also, "Contingent Valuation is an example of a survey-based, stated-preference method, which relies on what people say that they would do under well defined but hypothetical circumstances" they however emphasized that these methods do not provide values on environmental resource per se, but value on marginal changes on environmental resource.

On the subject of pollution prevention, INFORM, a Non-Profit organization which carried out two study surveys in 29 chemical companies in 1985 and 1992, have revealed benefits of environmental accounting to the business communities. It was revealed at the Global Environmental Management Initiative (GEMI) Conference through questionnaire administered by Nagle (Nagle 1994:243) that corporate professionals are placing a high priority on environmental accounting. In 1995, companies in the United States of America

through Business Round Table began to consider implementing environmental accounting in their facilities.

Field (2001:134) postulates a basic framework of benefit – cost analysis as including the following steps deciding the overall perspective from which analysis is being done such as the identifiable target public in a public project, specifying the project or programme, whether the physical project or the environmental regulatory framework, quantitatively describing the inputs and the output as much as possible in monetary value terms. Since many projects will extend over a period of time, the challenge faced is the prediction of values for the future inputs and outputs because a lot of uncertainties may arise. Estimate the social values of all inputs and outputs. Here, the challenge is the difficulty of monetizing certain socio costs or benefits or estimate values which may be placed on them through willingness to pay.

We finally compare the benefits and the costs either through the Net Benefit, i.e. Total benefits less Total Costs, or Benefit – Cost – Ratio which is Total Benefits divided by Total Costs.

1.4.1 Gap of Cost Benefit Model

Although CBA is most widely used as a model for costs evaluation, it is controversial because of the usually substantial long-term period and uncertainty in a constant discount rate. This is not only considered as unrealistic for the future cash flow but also, the implication on the evaluation outcome and eventual implication on environmental decisions. In Newell and Pizer (2003:52-71 and 2004:519-552), an averaging of three discounting models has been advocated for purpose of the CBA. The three new models are: Constant exponential model, Newell-Pizer discount model, and State Space model. In the empirical data research, the rates of the constant exponential discounting rate is highest of the three, the Newell-Pizer model declines most steeply over time while the State Space is intermediate. Although details of these work is not the focus of this study, this study attempts a review of the concepts of eco-efficiency framework and the market valuation of environmental capital expenditure.

1.5 Eco-efficiency framework

An ecosystem is largely determined by the natural environment as opposed to the activities of man. There is a dynamic interrelationship between the natural environment and man. ERA (1998:109) in its contribution to the issue of environmental sustainability (see effects on environment on Tables 2 – 4), emphasize man's critical responsibility to face the challenge of depletion of the environment. ERA has therefore, suggested the need to address three critical questions: How can man minimize use of the natural resources and maximize natural resource supply? How can the supply of natural resources be sustained without damage to the environment? Where damage has occurred to the natural environment particularly the non-replenishing environment, how can this be repaired?

The background of this study is therefore, that of securing and to facilitate eco-efficiency. Eco-efficiency according to Enahoro (2009:56) suggests that organizations can produce more useful products while simultaneously reducing negative environmental impacts, resource consumption and costs. Eco-efficiency further suggests that rather than focus on the consequences of negative environmental impact, attention should be on attacking the causes. In the opinion of Hansen and Mowen (2000:666), this concept suggests at least three important messages, firstly, improving ecological and economic performance which should be seen as complementary. Secondly, that improving environmental performance should not be viewed as charity and goodwill but a matter of competitive necessity. This is in contrast to Rubenstein's (1990:2) view where he had opined that social costs (i.e. environmental costs) which are not matched with related revenue are incurred not for the good of the individual company but for the society. A third suggestion is that eco-efficiency should be seen as supportive of sustainable development.

In the views of Gray and Bebbington (2006:8) and Walley and Whitehead (1994:46-52), eco-efficiency which has been emphasized as Environmental Management System (EMS) is the application of accounting design to attain financial and economic savings in resource usage. It is also, the reduction of wastes, energy and emissions that will necessarily lead to reductions in corporate adverse impact on the environment.

Hansen and Mowen (2000:667) have further proffered definition for sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs.' They opined that although, absolute sustainability may not be attained, progress toward its achievement has some merit. Eco-

efficiency, an implication of improving environmental performance will secure several advantages such as increasing customers demand for cleaner products, those produced without degrading the environment. Also, employees prefer to work for environmentally friendly organizations. Other benefits are that environmentally responsible firms tend to capture external benefits such as lower cost of capital and lower insurance rates; efficient environmental performance in an organization will secure good health to humanity; the consciousness to pursue environmental cleanliness will serve as a drive for improved technology; and a policy of clean environment and the implementation of the policy are capable of reducing environmental costs and making for a competitive advantage.

Table 2*: Decline in Size of Marine Fishing in the Nigeria Niger Delta*

Length in cms	**1981**	**1991**
Croaker	32.32	26.41
Soles	32.88	25.47
Threadfin	24.08	20.81

Source: ERA (1998:109): The Human Ecosystems of the Niger Delta – An ERA Handbook, Benin City, Nigeria; Publishers: Environmental Rights Action.

Table 3: Decline in Size in Tonnage/Trawler of Marine Fishing in the Nigeria Niger Delta

Tonnes/Trawler	**1980**	**1985**	**1989**
Croaker	739	403	521
Soles	82	89	19
Catfish	318	3	0
Snappers	105	27	16
Barracuda	159	21	7

Source: ERA (1998:109): The Human Ecosystems of the Niger Delta – An ERA Handbook, Benin City, Nigeria; Publishers: Environmental Rights Action.

Table 4: ***Mangrove conversion in Nigeria Niger Delta (Rivers and Bayelsa States) by Shell Petroleum Development Company alone***

ACTIVITY	IMPACT
Seismic Lines	56,000 km
Drilling	349 sites
Flow lines	700 km
Pipelines	400km
Flow stations	22 sites
Terminal	1 site

Source: ERA (1998:109): The Human Ecosystems of the Niger Delta – An ERA Handbook, Benin City, Nigeria; Publishers: Environmental Rights Action, and the World Bank Report of 1995.

1.6 Market valuation of environmental capital expenditure

Clarkson, Yue and Richardson (2004:330-353) have examined the market valuation of environmental capital expenditure (ECE) investment related to pollution abatement in the pulp and paper industry. In their view, in order to be capitalized, an asset should be associated with future economic benefits. It was observed that investors condition their evaluation of the future of economic benefits arising from ECE on an assessment of the firm's environmental performance. It is further revealed that there are incremental economic benefits associated with ECE investment by low-polluting companies and not high-polluting companies. This work, acknowledging its limitations, have not resolved agreed standards for issues for public disclosures

The purpose of the study on Environmental Cost Accounting for Capital Budgeting by Savage, Brody, Cavander and Lach in U.S EPA (1995c:21) was to benchmark current practices of environmental accounting as they applied to capital budgeting decisions in the U.S. manufacturing companies. The study sought to provide corporate management and the public sector an understanding of how to integrate environmental cost considerations into decisions of investments which impact on the environment. Study areas were capital budgeting process, tracking costs, costs inventory and environmental costs quantification. The study further highlights the Costs Boundaries otherwise regarded as the Environmental Cost Primer Model.

2.0 Environmental institution and policy standards in Nigeria

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. Its duties include the management and monitoring of environmental standards, devising policies for the protection of the environment such as biodiversity and conservation among others. FEPA whose activities and regulations have since 1999 been taken over by the Federal Ministry of Environment (FME) in Nigeria, is also saddled with the responsibility for the sustainable development of Nigeria's natural resources. It is also saddled with the responsibility of development of operation of procedures for conducting environmental impact assessments of all development projects.

To ensure that FEPA was empowered to manage environmental issues, the Environmental Impact Assessment (EIA) Act was passed in 1992. The EIA Act empowers the Agency to ensure the implementation of mitigation measures and follow-up programmes such as the elimination, reduction or control of the adverse environmental effects of any project; the restitution of any damage caused by such effects, through replacement, restoration, compensation or any other means. (FEPA1992) According to the source, the following are some of the identified increases in production that have also increased environmental problems in Nigeria are deforestation and desertification resulting from the exploitation of unprocessed log wood for export; depletion of wild fauna and flora due for export of certain endangered species. Others reasons are 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 the

country and increased activities in the tannery industries leading to discharge of increased volume of effluents. Tannery and similar industrial and manufacturing sectors have exacerbated the incidence of pollution of rivers and streams including underground water in certain industrialized areas of Nigeria.

The Nigeria National Agenda 21, states some of the relevant legislations that have either been reviewed or are under review in response to the possible negative impacts of trade on environment. These include: Gas Re-Injection Act; Endangered Species (Control of International Trade and Traffic) Act; Minerals Act; Forestry Laws and Harmful Wastes (Special Criminal Provisions, etc) Act

General opinion of policy assessment is that Nigeria has policies on environmental management, which are impressive. The objective or implementation of the policies have, however not been realized. The laws have been weakly implemented so far.

3.0 Conclusions and policy matters

Challenges being faced in environmental accountability are the lack of skills and consequently absence of the practice of environmental costing. Generally guidelines of environmental management accounting (EMA) is still evolving. Environmental costs development as practiced in some countries has not yet attained prescribed standards. In view of the observations, emerging policy matters and recommendations are:

Standard definitions should be agreed for environmental spending and expenditure for purpose of annual reports' environmental accounting in the manufacturing, oil and gas, the transport sector and other productive sectors operating in Nigeria which emit pollution. The adoption of the United Nations Environmental Management Accounting (EMA) Standards will enable for the formulation of a Generally Accepted Accounting Principle (GAAP) which will evolve environmental accounting practice. This will also enable for joining global campaign for environmentally enhanced society.

Whereas statutory disclosure of environmental information is fast becoming the practice in the developed nations, regulatory agencies in developing countries should design statutory requirements for corporations to adhere to. Statutory environmental audits should also be carried out periodically.

Accounting regulatory bodies should accommodate the growing awareness in environmental accounting and accountability and formulate disclosure requirements. The

Securities and Exchange Commissions should also consider the urgent need for placing demand on corporate organizations which impact on environment environmental disclosure requirement. Companies considered as polluters registered on the Stock Exchange Market should provide information about the costs incurred to conform to environmental legislations. Finally, agencies responsible for environmental protection and regulations should embrace global environmental best practices and should enforce for efficiently environmental regulations.

References:

Alberini, A; Rosato, P and Turvani, M (2006). Valuing complex natural resource systems: The case of the lagoon of Venice. The Fondazione Eni Enrico Mattei (FEEM) Series on Economics, The Environment and Sustainable Development; U.K Edward Elgar Publishing Limited.

Clarkson, P.M, Yue and Richardson, G.D (2004). The Market Valuation of Environmental Capital Expenditures by Pulp and Paper Companies. *Accounting Review*, 79(2), April 2004, pp.330-353

Crown Copyright (2005). Kyoto Protocol to the United Nations Framework Convention on Climate Change, Treaty Series 6. Controller of Her Majesty's Stationery Office, Enahoro, J.A (2009): Design and Bases of Environmental Accounting in Oil & Gas and Manufacturing Sectors in Nigeria; Covenant University, Ota, Nigeria; PhD Thesis in Accounting.

Environmental Rights Action (1998). The Human Ecosystems of the Niger Delta: An ERA Handbook; Benin City, Nigeria; ERA Publication Fagg, B.F; Smith, J.K; Weitz, K.A and Warren, J.L, (1993). Life-Cycle Cost Assessment (LCCA). Preliminary Scoping Report prepared for: U.S. Department of Energy, October.

Federal Environmental Protection Agency (1992). Environmental Impact Assessment Act. Retrieved in June 2006 from www.nigerialaw/federal environmental protection agency

Field, B.C (2001). Natural Resource Economics, An Introduction, Boston, McGraw-Hill

Global Environmental Management Initiative (1994). Finding Cost-Effective Pollution Prevention Initiatives: Incorporating Environmental Costs into Business Decision Making, Spring Conference proceedings.

Gray, R and Bebbington, J (2006). Environmental Accounting, Managerialism and Sustainability: Is the planet safe in the hands of business and accounting? Retrieved in May 2006 from st.andrews.ac.uk/management/csear/…/dps.sustain-envaccman.html

Hansen, D.R and Mowen, M.M (2000). Cost Management, Accounting and Control, Third Edition; South-West College Publishing a division of Thomson Learning.

Howes, R. (2002). Environmental Cost Accounting: An Introduction and Practical Guide, London, The Chartered Institute of Management Accountants.

IASB IFRIC (2004:3): Press Release, December

International Maritime Organization (1989). Offshore Installations Guidelines and Standards for the removal of Offshore Installations and Structures on the Continental Shelf and in the Exclusive Economic Zone; IMO resolution. A 672 (16). Retrieved in June 2006 from http://www.londonconvention.org/Removal/htm.

International Accounting Standards Board (2004). IFRIC Issues guidance on accounting for greenhouse gas emissions and scope of leasing standard; Press Release. Retrieved in June 2006 from http//www.iasb.org/news/index.asp?showPageContent

International Accounting Standards Board International Financial Reporting Interpretation Committee [IASB IFRIC] (2004). Press Release, December International Federation of Accountants (1998). Management Accounting Concepts, New York**.**

International Federation of Accountants (2005). Environmental Management Accounting, International Guide Document. New York.

Nagle, G (1994). Business Environmental Cost Accounting Survey. In Global Environment Management Initiative 1994 Conference Proceedings, March 16-17, Arling, VA.

Newell, R. G., and Pizer**,** W.A. (2003). Discounting the distant future: how much do uncertain rates increase valuations? *Journal of Environmental Economics and Management* 46: pp.52–71.

Newell, R. G., and Pizer, W.A..(2004).Uncertain discount rates in climate policy analysis. *Energy Policy* 32, pp.519–529.

Nigeria Agenda 21 (1999)**.** Economic Aspects Of Sustainable Development In Nigeria. Retrieved in June 2006 from file://A:\Agenda%2021%20-%20Nigeria.htm

Roberts, C. (1992). Environmental Disclosures in Corporate Annual Reports in Western

Europe in Salomone, R and Galluccio, G. (2001). Environmental Issues and Financial Reporting Trends, A Survey in the Chemical and Oil & Gas Industries, The Fondazione Eni Enrico Mattei Note diLavoro Series Index: http://www.feem.it/web/activ/_activ.html, cited in March 2007.

Rubenstein, D.B. (1990). There's no accounting for the Exxon Valdez (accounting for costs incurred from environmental damage), *The CPA Journal Online*, July 1990; The New State Society of CPAs Legal Notice, 2006

Salomone, R and Galluccio, G. (2001). Environmental Issues and Financial Reporting Trends, A Survey in the Chemical and Oil & Gas Industries, The Fondazione Eni Enrico Mattei Note diLavoro Series Index: http://www.feem.it/web/activ/_activ.html. Retrieved in March 2007.

Santhakumar, V and Chakraborty, A (2003). Environmental Costs and their impact on the net present value of a hydro-electric project in Kerala, India in *Environment and Development Economics*, Volume 8, Part 2., Cambridge.

Shield, D; Beloff, B and Heller, M (1996). Environmental Cost Accounting for Chemical and Oil Companies; A benchmarking study, June, Gulf of Mexico.

U.S.EPA (1995a). Environmental Accounting Case Studies: Green Accounting at AT&T

U.S EPA (1995b:9). An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms, Office of Pollution Prevention and Toxics, June. Retrieved in May 2005 from http://www.epa.gov/opptintr/acctg/resources.htm

U.S.EPA and Tellus Institute (1995c). Environmental Cost Accounting for Capital Budgeting: A Benchmark Survey of Management Accountants, June

Walley and Whitehead (1994). Its not easy being green, *Harvard Business Review* May/June, pp. 46 – 52.

Wikipedia (2007). List of Treaties, June 10; Retrieved in March 2006 wikipedia.org/wiki/List.