Environmental accounting: A tool for promoting environmental management in the Niger Delta

~ *Ph. D.* **Uwuigbe Uwalomwa** *(Department of Accounting, School of Business, College of Development Studies, Covenant University, Ogun State, Nigeria)*

Abstract: *Oil exploration and exploitation has over the last four decades impacted disastrously on the socio-physical environment of the Niger Delta oil-bearing communities in Nigeria. This invariably is responsible for the social unrest in the host communities. In response to various pressures by environmental lobby groups, companies have began to realize the need for the integration of environmental reporting practice in their annual report. To this end, this paper studied exploratively the extent to which the introduction of environmental accounting practice will help in bringing about an improved environmental sustainability and an effective environmental management system in the Niger delta region of Nigeria. The paper concludes that the integration and the disclosure of environmental liabilities will to a large extent reduce the social unrest in these areas. This in return will help organizations to maximize the efficient use of their resources, minimize environmental liabilities and demonstrate a good corporate image. The paper therefore recommends that accountants and environmental experts should pool their skills to form a multidisciplinary team to address environmental issues.*

Keywords: environmental accounting, sustainability, government, Niger Delta

1. Introduction

Industrial activities and operations of multinational corporations worldwide have caused significant environmental liabilities with its associated huge financial impacts. Industries are therefore becoming progressively more aware of the social and environmental liabilities arising from their operations and products (Environmental Protection Agency, 2000). These liabilities include impacts on the natural environment; conveyed through the three principal media: air, water and soil. Financial effects are lately more often portrayed in corporate images and disclosures (Goodstein, 2002). Nevertheless, some of these multinational corporations mostly those domiciled in developing countries still find it difficult to relate social environmental liabilities to financial effects (Carter, Perruso, and Lee, 2001)). This is primarily due to inherent uncertainties in measuring these liabilities, and in ways of expressing them as part of corporate financial evaluations (Hayden, 1989). Uncertainties in measuring environmental liabilities can be addressed by using environmental evaluation, environmental impact assessment techniques and accounting techniques, such as qualitative matrix evaluation and streamlined life cycle analysis methods (Labuschagne, 2002); and quantitative methods including quantitative life cycle analysis, life cycle costing and total cost assessment (Veefkind, 1998). Environmental accounting can be used to demonstrate the potential for environmentally beneficial investments to yield significant financial payoffs, through the avoidance of environmental liabilities (Hayden, 1989). While environmental accounting now forms part of industrial decision making in first world countries, there is a dearth of similar commitment to the environment in the developing countries, especially Nigeria as companies are still far behind in understanding and applying environmental accounting. Therefore the objective of this paper is to study exploratively the extent to which the introduction of environmental accounting practice will help in bringing about an improved environmental sustainability and an effective environmental management system in the Niger delta region of Nigeria.

In other to have a good insight of this paper, the paper is divided in three parts. The first part covers the introduction; the second which is the literature review covers areas such as what is environmental accounting; the principle of environmental accounting, its benefits, why companies should use it and also the environmental consequences of petroleum operations in the Niger- Delta region. The final section covers the conclusion and recommendations.

2. Literature review

Environmental management can be defined as the process of allocating natural resources so as to make optimum use of the environment in satisfying basic human needs, if possible, for an indefinite period and with minimal adverse effects to the environment (Barrow, 1997). However, the earth's ecosystems cannot sustain current levels of economic activity and material consumption; therefore effective sustainability initiatives are required as basis of corporate environmental management frameworks to relieve pressure on ecological and social integrity (Wackernagel and Rees, 1996). Environmental accounting is an innovative sustainability initiative. Coupled with the

various standardized procedures and practices for effective environmental management, for example, ISO 14000 and Integrated Environmental Management Systems (IEMS), defines the environmental management frameworks that exist at present that can assist companies in managing, measuring and improving the environmental aspects of their operations and within which industries must operate today (Grace, Perez, Maywah, 1999).

What is Environmental Accounting

According to International Federation of Accountants (1998, p2), "Environmental accounting is seen as the management of environmental and economic performance through the development and implementation of appropriate environment-related accounting systems and practices". While this may include reporting and auditing in some companies, environmental accounting typically involves life cycle costing, full-cost accounting, benefits assessment, and strategic planning for environmental management. A complementary definition given by Steele and Powell (2002) viewed environmental accounting as the identification, allocation and analysis of material streams and their related money flows by using environmental accounting systems to provide insight in environmental impacts and associated financial effects. Green (environmental) accounting involves the measuring of the environmental performance of an organization, including government bodies and manufacturers, in economic term. It is a type of cost benefit analysis which relates to the monetary and physical assessment of environmental cost associated with the development and operational activities and the economic benefits of good environmental management and other actions (such as implementation of pollution prevention technology). Green accounting can be used to determine less tangible and external cost for projects and activities such as bio-diversity, human health and aesthetic values. It is also aimed at broader issues such as implementing sustainable business practice to conserve natural resources for future generations. It generally serve as a management tool which can be used for a variety of purposes such as improving environmental performance, controlling costs, investing in cleaner technologies, developing "greener" processes and products and informing decisions related to product mix, product retention and product pricing.

Basically, the objective of environmental accounting is to measure the effects of the actions of the organization upon the environment and to report upon those effects (Crowther, 2002). In other words the objective is to incorporate the effect of the activities of the firms upon externalities and to view the firms as a network which extends beyond just the internal environment to include the whole environment. In this view of the organization, the accounting for the firm does not stop at the organizational boundary but extends to include not just the business environment in which it operates but also the whole social environment. Environmental accounting therefore adds a new dimension to the role of accounting for an organization because of its emphasis upon accounting for external effects of the organization's activities. In doing so this provides recognition that the organization is an integral part of the society, rather than a self contained entity which has only an indirect relationship with society

at large. This self-containment has been the traditional view taken by an organization as far as their relationship with society at large is concerned, with interaction being only by means of resource acquisition and sales of finished products or services. Recognition of this closely intertwined relationship of mutual interdependency between the organization and society at large, when reflected in the accounting of the organization, can help bring about a closer and possibly more harmonious relationship between the organization and the host community.

The Principles of Environmental Accounting

In order to understand the rationale for environmental accounting, and the basis on which it is suggested that such accounting system operates, it is necessary therefore to consider the principles upon which environmental accounting operates. There are three basic principles to environmental accounting as identified by Schaltegger, Muller, Hindrichsen, (1996)

a) Sustainability;
b) Accountability;
c) Transparency.

Sustainability

Sustainability is concerned with the effect which action taken in the present has upon the options available in the future. If resources are utilized in the present then they are no longer available for use in the future, and this is of particular concern if the resources are finite in quantity. Thus raw materials of an extractive nature, such as coal, iron and oil, are finite in quantity and once used are not available for future use. At some point in the future therefore, alternatives will be needed to fulfill the functions currently provided by these resources. This may be at some point in the relatively distant future but of more immediate concern is the fact that as resources become depleted then the cost of acquiring the remaining resources tends to increase, and hence the operational costs of organizations tend to increase.

Sustainability therefore implies that society must use no more of a resource than can be regenerated. This can be defined in terms of the carrying capacity of the ecosystem and described with input – output models of resource consumption (Hawken 1993).

Accountability

Accountability is concerned with an organization recognizing that its actions affect the external environment, and therefore assuming responsibility for the effects of its actions. This concept therefore implies a quantification of the effects of actions taken, both internal to the organization and externally. More specifically the concept implies a reporting of those quantifications to all parties affected by those actions. This implies a reporting to external stakeholders of the effects of actions taken by the organization and how they are affecting those stakeholders. This concept therefore implies recognition that the organization is part of a wider societal network and has responsibilities to that entire network rather than just to the owners of the organization. Alongside this acceptance of responsibility therefore must be a recognition that those external stakeholders have the power to affect the way in which those actions of the organization are taken and a role in deciding whether or not such actions can be justified, and if so at what cost to the organization and to other stakeholders.

Transparency

Transparency, as a principle, means that the external impact of the actions of the organization can be ascertained from that organization's reporting and pertinent facts are not disguised within that reporting. Thus all the effects of the actions of the organization, including external impacts, should be apparent to all from using the information provided by the organization's reporting mechanisms. Transparency therefore can be seen to follow from the other two principles and equally can be seen to be a part of the process of recognition of responsibility on the part

of the organization for the external effects of its actions and equally part of the process of transferring power to external stakeholders.

Benefits of Environmental Accounting

Environmental accounting provides an explicit recognition that stakeholders other than the legal owners of the organization have power and influence over that organization. Environmental accounting therefore provides a mechanism for transferring some of the power from the organization to these stakeholders and this voluntary surrender of such power by the organization can actually provide benefits to the organization. Benefits from increased disclosure and the adoption of environmental accounting can provide further benefits to the organization in its operational performance, beyond this enhanced relationship with society at large. These benefits, as argued by Bartelmus (1992, p.156), to include:

i. An improved corporate image for the organizations which will translate into increased confidence of stakeholders, investors, insures and financial institutions.

ii. Improved relationships with local communities, regulators and non-governmental organizations. Local communities will be more tolerant and even supportive of organizations that openly communicate with their stakeholders. Transparency and documentation of social and environmental accountability are important to gain confidence of local communities

iii.Greater control of environmental performance. Environmental reporting allows organizations to present information on their environmental performance and also ensures that the host communities are aware of the measures being taken by organizations to bring about environmental sustainability.

iv.The integration of an environmental accounting system by organization will enhance the maximization of environmental resources, reduce waste and minimize environmental liabilities.

Why Should Companies use Environmental Accounting?

Companies and managers usually believe that environmental costs are not significant to the operation of their businesses. However, often it does not occur to them that some production costs have an environmental component. For instance, the purchase price of raw materials: the unused portion that is emitted in a waste is not usually considered an environmentally related cost. These costs tend to be much higher than initial estimates and should be controlled and minimized by the introduction of effective cleaner production initiatives whenever possible. By identifying and controlling environmental costs, Environmental Management

Accounting systems can help environmental managers justify these cleaner production projects, and identify new ways of saving money and improving environmental performance at the same time. The systematic use of EMA principles will assist managers in identifying environmental costs often hidden in a general accounting system. When hidden, it is impossible to know what share of the costs is related to any particular product or process or is actually environmental. Without the ability to isolate and separate this portion of the overall cost from that of production, product pricing will not reflect the true costs of its production. Polluting products will appear more profitable than they actually are because some of their production costs are hidden, and they may be sold under priced (Patrick and Francois, 2006). Cleaner products that bear some of the environmental costs of more polluting products (through the overhead), may have their profitability underestimated and be over priced. Since product prices influence demand, the perceived lower price of polluting products maintains their demand and encourages companies to continue their production, perhaps even over that of a less polluting product. Finally, implementing environmental accounting will multiply the benefits gained from other environmental management tools. Besides the cleaner production assessment, EMA is very useful for example in evaluating the significance of environmental aspects and impacts and prioritizing potential action plans during the implementation and operation of an Environmental Management System (EMS). EMA also relies significantly on physical environmental information. It therefore requires a close cooperation between environmental managers and management accountants which will result in an increased awareness of each other's concerns and needs. As a tool, EMA can be used for sound product, process or investment project decision-making. Thus, an EMA information system will enable businesses to better evaluate the economic impacts of the environmental performance of their businesses.

The Environmental Consequences of Petroleum Operations in the Niger-Delta Region

Although petroleum resources sustain the Nigerian economy, industrial activities in the sector have been known to be associated with substantial environmental degradation and social crises, posing a potential threat to sustainable development in the Niger Delta, where the bulk of the country's petroleum resources are found. Most of the negative environmental consequences of oil industry activities are localized and more intense in the areas of primary activities; some of the effects have trans-boundary implications (Orubu, Odusola & Ehwarieme, 2004). For example, gas flaring which is a common feature of the Nigerian petroleum industry has been known to be a factor in the problem of global warming (World Bank, 1995). In the same vein, mangrove swamp and rain forest destruction as a result of oil industry activities can have long-term consequences for both ecological and climatic balances.

Despite the different environmental policies and strategies that has been made in Nigeria since the Rio conference in 1992 to address the core environmental issues; environmental degradation has remained the greatest problems in the Niger-Delta region. The table below shows the level of oil operations and their impacts on the environment:

Table 1: Oil operations and their impacts on the environment

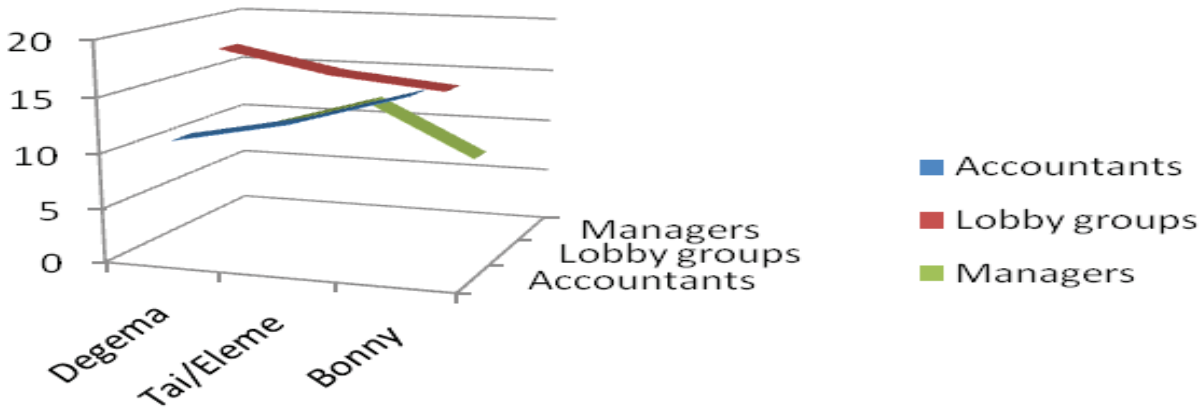
S/N	Activity/Event	Actual and Potential Impact on the Environment
1	Exploration – including geological surveys and, geophysical investigations	Destruction of forest land, vegetation and farm land/human settlement. Noise pollution and vibration from seismic shooting. Effects on animals and nearby settlers (on shore) and on fisheries (near/offshore). Disturbances of flora and fauna habitats. Dislocation of economic activity. Tension on the social environment due to compensation disagreements
2	Drilling	Accumulation of toxic materials from drilling materials, oil pollution of the sea, beaches or land. Destruction of fisheries production. Destruction of breeding ground for some marine fisheries. Alteration of the taste of fish. Killing of bottom dwellers. Pollution of underground water (waste pots). Adverse health effect on humans, social tension arising from compensation disagreements from accidental spills from locations.
3	Product/process (1)Plat forms and tank farms (2)Gas flaring	Water pollution from long term cumulative effects of produced water (with high salinity). Air pollution from gas and processing evaporation and flaring. Production of heat kills vegetation around the heat area. Suppresses the growth and flowering of some plants. Reduces agricultural productivity and wild life concentration in area.
4	Refining petroleum	Air pollution and waste water impacting negatively on human health and ecosystem.
5	Oil spillage	Destruction of farmland, fishery and aquatic resources and mangrove ecosystem. Water pollution. Creates social tension due to compensation disagreements.
6	Tanker loading location	Water pollution from ballast and tank washing. Deck drainage, spillage during loading Operation.
7	Storage depot	Land pollution from effluent water and solid waste of chemical cans and drums. Destruction of farmland for the establishment of storage depots, water pollution from effluent water. Air pollution from gaseous fumes during loading.
8	Transportation	Disruption of the sea-bed by dredging for pipeline installation. Sedimentation along pipeline routes. Water pollution from consequences of leaks from fracturing or breaking of pipe caused by metal fatigue, trawlers and dredges or sea floor failures, and sabotage. Air pollution by transport tankers. Destruction of environmentally sensitive area e.g. lowland, where estuaries, wet lands and sand dune fields exist. Erosion and flooding of the area drastically affected.
9	Marketing	Pollution of immediate environments from retail outlets. High hazard potential where located near residential buildings.

Adapted from Orubu et al, (2002)

A careful analysis of Table 1 as observed by Orubu et al, (2002) shows that every aspect of oil operations, though in varying degrees, has significant negative implications for the environment. The second, and closely related to the first, is that in most cases all of the facets of what constitute the environment are affected in one single operational line and Thirdly, the effects of these various aspects of oil operations on the environment are not mutually exclusive, but rather reinforcing. Fourthly is the fact that environmental consequences impose economic effects on the people. And finally, social tension tends to result from compensation disagreements arising from environmental damage claims by host communities.

In light of the problems identified above, accountants are of the opinion that the basic premise of environmental disclosure practice is that conventional accounting practices and existing operational and financial management within organizations obscure environmental information. By clarifying inputs, outputs, and impacts, the integration of environmental accounting can help companies and organizations develop an innovative solution that is targeted to achieving environmental sustainability in this region (Owolabi, 2000). This view is supported by a similar survey conducted by Uwuigbe & Olatunji (n.d) on the perceptions of accountants, managers and environmental lobby groups towards environmental reporting in the Niger- Delta Region. The result of this study is depicted in the figure below:

Fig 1: perceptions on the adoption of environmental disclosure by companies



Adapted from Uwuigbe & Olatunji, (n.d)

From the above, the result across the three selected local governments in Rivers State shows that an average of 70% of accountants of companies located in these areas were of the opinion that environmental reports should be integrated into the conventional accounting system. This is because, once organizations are made accountable for environmental costs; they would be compelled to minimize the potentially harmful effects of their activities. They further opined that the reporting of environmental liabilities will require organizations to forecast the potential environmental impacts of their activities and

accordingly estimate contingent liabilities and create provisions for environmental risk. In the same survey, an average of 52% of the managers was of the opinion that environmental accounting might be useful for the reporting of environmental costs.

Finally, an average of 87% of the lobby groups in these regions was affirmative that the disclosure of environmental issues should be of upmost importance in the annual reports of companies.

6. Conclusion and recommendations

In conclusion, environmental accounting is a tool for organizations to both improve their environmental performance and enhance their business efficiency. This will require organizations to take active roles in examining their practices and then determining how their impacts should be managed, which will in the long-run bring about an improved environmental sustainability and an effective environmental management system in the Niger delta region of Nigeria. In addition, the integration and the disclosure of environmental cost will to a large extent reduce the social unrest in these areas. This in return will help organizations to maximize the efficient use of their resources, minimize environmental liabilities and demonstrate a good corporate image.

The paper therefore recommends that as a result of the environmental problems in this region, there is a need for companies involved in oil exploration and production activities to imbibe a new method of recording, analyzing and reporting environmentally induced financial impact and ecological impact. These will in the long run promote more accurate costing and pricing of products and can also aid companies in the design of more environmentally preferable processes, products, and services for the future.

On the government's part, the paper recommends that once environmental costs are properly traced back to products or services, government can use the information to direct the market through the introduction of taxation instead of relying only on environmental legislation.

Finally, accountants and environmental experts could pool their skills to form a multi-disciplinary team to address environmental issues of significant to the organization and recommend appropriate remedial actions.

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