Environmental Management Accounting Disclosures: A Case Study of Top 30 Fortune 500 Companies

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ABSTRACT

Today the grave environmental crisis is the greatest danger facing mankind in its face. Man's insatiable need and greed has catapulted lacs and lacs of species of flora and fauna in the danger zone, with their chances of becoming extinct increasing by every passing day. Many developing countries have implemented policies and taken actions to implement environmental disclosures practices, at the national and local level, in the public and private sector. In present paper an attempt has been made to analyze that how EMA disclosures will enhance the image of the select Fortune 500 Companies. The EMA disclosures are verified in the basis of four aspects Energy, Waste, Water and Carbon Footprint. It can be inferred from the results that better EMA disclosures can help companies to earn higher profits and reduce costs.

Keywords: *Environmental Management Accounting, EMA Disclosures, Carbon Footprint, Environmental Costs*

I. Introduction: Environmental accounting is relatively a recent entrant in the domain of accounting. "Traditional accounting is limited when it comes to measuring natural wealth. Accountants measure assets, earnings; one year behind the times...Jet pilots don't use rear-view mirrors. If we want to account for the environment, we have to look forward. Accountants need to develop new ways to account for natural resources."[1] Environmental accounting is defined as the identification, compilation, estimation and analysis of environmental cost information for better decision-making within the firm. It can be defined as "The generation, analysis, and use of financial and non-financial information in order to optimize corporate, environmental and economic performance, achieving a sustainable business (Bennett and James, 1998) [2] the ultimate objective of environmental accounting is to clearly indicate the environmental cost of each process, separating the non environmental costs from the environment costs.

Environmental Management Accounting is the identification, collection, analysis and use of two types of information for internal decision making:

- Physical information on the use, flows and destinies of energy, water and materials (industry wastes) and

- Monetary information on environment – related costs, earnings and savings.

In other words Environmental Management Accounting (EMA) includes both Physical Environmental Management Accounting (PEMA) and Monetary Environmental Management Accounting (MEMA) [3]. EMA serves business managers in making capital investment decisions, costing determinations, process/product design decisions, performance evaluation and a host of other forward-looking business decisions (UNDSD, 2000 P.39) [4]. EMA approaches and information can be used not only to help assess particular investment projects, but also to help assess the environmental and related cost implications of particular types of materials and products.

II. Objectives:

Following are the main objectives of this paper:

1. To examine the disclosure practices regarding EMA in sample units.
2. To explore disclosure index model for EMA.

III. Literature Review

3.1. Olalekan & Jumoke (2017) [5] in their study established the level of environmental management accounting practices among listed firms in Nigeria and South Africa, and identified the barriers limiting such practices. The study utilized primary data through the administration of structured questionnaire, and a total of 44 accountants (22 from each country) participated. Data collected were analyzed using descriptive statistics involving mean scores, frequencies, tables and percentages. The study found that EMA practices are higher in South Africa than Nigeria given the number of EMA techniques applied by firms in South Africa (n=72) compared to Nigeria (n=41). This paper concluded that the government and other stakeholders in Nigeria should play active roles in making and enforcing environmental laws and regulations so as to curb complacency in relation to environmental issues among firms.

3.2. Jalil, Abar, & Dadashian (2016) [6] suggested in their study that Environmental management system (EMS) is a useful approach for improving the environmental function of organizations. Since the main decisions of environmental management depends on the costs and benefits of the suggested changes in the environmental behavior of the firm, Environmental management accounting (EMA) seems to be an essential and fundamental step for establishing an efficient environmental management. EMA is unfortunately most likely ignored or not enough discussed in neither management nor environmental fields, especially in developing countries. Therefore, this research aims to implement the environmental management accounting in a leather factory of Iran. Furthermore, this practical research introduces a suitable and practical model for implementation of EMA in the mentioned industry. In the end a model for EMA implementation in leather industries was produced.

3.3. Joseph (2016) [7] in his paper discussed about internal decision making tools in taking decisions regarding environment consideration. Environmental Management Accounting (EMA)'s implementation in corporate is the need of the day. Environmental Management Accounting is an important topic and it plays a vital role for the development of the economy. The corporate sector can get benefit by implementing this system. They can get actual cost of production of products, real and hidden costs and also helps them to fix proper price. They have a chance to make stake holders happy and can proudly talk about their eco friendly atmosphere and product they manufacture.

3.4. Nyide & Lekhanya (2016) [8] discussed that the use of environmental management accounting (EMA) remains debated in South Africa and the literature reveals that EMA is still at an infancy stage in the emerging economies, including South Africa. Currently, there is limited existing research on environmental management accounting practices available for use by the hotel sector in South Africa. The overall aim of this study was to investigate and describe the use of the environmental management accounting tools by the hotel sector in the 3-5 star categories in KwaZulu-Natal. The research was an exploratory study and qualitative in nature using a single case study with embedded units approach. It is envisaged that study will bridge the gap that exists in South Africa as far as environmental management accounting is concerned and it will also make the provision of meaningful results for policy decision making by the relevant stakeholders in the hotel industry. Moreover, it established factors that drive and/or hinder the implementation of EMA tools that would control and manage environmental costs and their root causes.

IV. Research Methodology

4.1. Scope of Study

The period of study is limited to one year (2016-17). This study has been conducted on data taken from the corporate social responsibility reports, environmental reports or any other reports related to environment downloaded from the website of selected companies. Top 30 companies are selected from Fortune 500 Global companies list ranked on the basis of revenues for the year 2016. Data related to four aspects viz. Energy, Water, Waste and Carbon Footprint are taken into consideration

Score is given to companies on the basis of 5 point scale as follows:

(i) 1 for no disclosure

(ii) 2 if one sentence disclosure is made

(iii) 3 if more than one sentence disclosures are made

(iv) 4 if one figure is disclosed

(v) 5 if more than one figures are disclosed

The scores are given on the basis of disclosures on Physical EMA and Monetary EMA considering the four aspects i.e. Energy, Water, Waste and Carbon Footprint.

The tables are prepared on the basis of total score on the four aspects for Physical EMA and Monetary EMA disclosure. Like for Walmart the score for Physical EMA disclosure is calculated as in respect of Energy 5, Water 4, Waste 4 and Carbon Footprint 5, the total is 18 as shown in table 1. The score for Monetary EMA disclosures of Walmart is calculated as follows for Energy 4, Water 1, Waste 5 and Carbon Footprint 3, the total is 13. Likewise the scores of other companies are calculated.

4.2. Hypothesis of the Study:

(i) **H_0**: Physical EMA Disclosures are at par with Monetary EMA Disclosures.

Table 1

Sample regarding how Physical EMA Total Scores are given

Name of Company	Type of Business Engaged in	Total Score Based on Physical EMA Evidence
1. Walmart	Retail Corporation	18
2. State Grid Corporation of China	Construction & Operation of Power Network	15
3. China National Petroleum Corporation	Oil & Upstream Gas Operations (Energy Company)	20

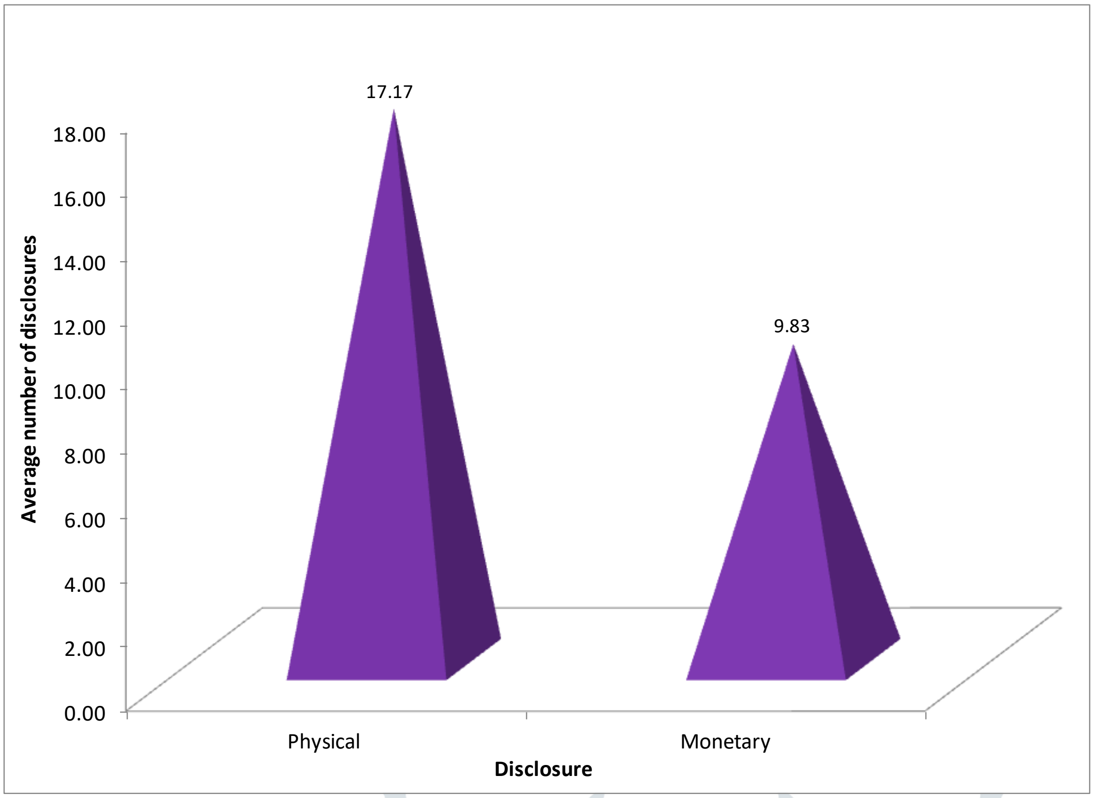
Table 2
Sample regarding how Monetary EMA Total Scores are given

Name of Company	Type of Business Engaged in	Total Score Based on Monetary EMA Evidence
1. Walmart	Retail Corporation	13
2. State Grid Corporation of China	Construction & Operation of Power Network	10
3. China National Petroleum Corporation	Oil & Upstream Gas Operations (Energy Company)	7

Likewise the scores are given to the remaining 27 companies.

Results of the Hypothesis Tested:

Disclosure	N	Mean	SD	t	df	Result
Physical	30	17.17	4.20	9.071	29	***
Monetary	30	9.83	3.91			



H_0 was that the "Physical EMA Disclosures are at par with Monetary EMA Disclosures". This hypothesis was tested using t-test. The test result given above shows that average number of disclosures under physical EMA were significantly high as compare to average number of disclosures under monetary EMA ($t = 9.071$, $p < 0.001$). The average number of disclosures under physical EMA by 30 companies was 17.17 whereas the average numbers of disclosures under monetary EMA were 9.83. Hence it can be concluded that the physical EMA disclosures is significantly higher than monetary EMA disclosures. **Thus the null hypothesis that "Physical EMA disclosures are at par with monetary EMA disclosures" is rejected and concluded that Physical EMA disclosures are more in number as compared to monetary EMA disclosures.**

The analysis of this investigation is mainly summarized as under:

1. H_0 is tested using t-test and is rejected.
2. Only one company Toyota Motor Corporation is making full disclosures on both the aspects Physical EMA and Monetary EMA.
3. The Companies with high scores are mainly from Oil and Gas Extraction sector.
4. The main reasons for low disclosures may be the lax mandatory requirements for communicating Energy, Water, Waste and Carbon Footprint information in the countries in which the business of these companies are established and also on international level. Without pressure from the concerned government that establishes guidelines that bind organizations to accounting procedures and practices related to environmental management, the organizations will be less likely to adopt EMA disclosure practices.

5. The analysis of data revealed that some companies are also making disclosures on futuristic aspect like making goals to reduce carbon emissions in future. They may try to use energy from 100% renewable sources.
6. It has been observed that Environmental costs are not separately disclosed in annual reports whereas these form part of the overhead costs.
7. The companies are totally concerned about the major issues of environment that directly hamper the environmental performance. They seem to be totally agrees that they should perform their duty best by providing fully the information about EMA related disclosures, but it lacks in proper disclosure presentation in CSR and financial statements. It has been noted that both Physical and Monetary EMA disclosures are made in textual presentation form and not in tabular form.

V. Conclusion

As governments around the globe are placing greater emphasis on environmental issues, Gadenne et al. (2009) [9] claim that many initiatives have been formulated to increase the level of environmental awareness. If companies will disclose Monetary EMA disclosures properly it would help them to earn high profits and also majority of stakeholders will develop faith in company which will help in raising investments easily. It will help company to calculate environmental cost, savings and environmental revenues which can be earned from the sale of waste. It makes a significant difference, when companies report about how much they spent on environmental protection, whether this spending incurred for traditional end of pipe technologies and fines for polluting, or for staff training on EMS (Environmental Management System) and nature conservation sponsorship or whether the costs of non-product output have been included. That's why the cost categories are distinctly separated and should be disclosed separately [10]. Management accountants tend to be constrained to thinking within the existing chart of accounts, and pay less attention to environmental costs (Chang, 2007). Due to this break in communication, opportunities for reducing environmental costs remain unidentified. Like Physical EMA Disclosures, Monetary information must also be disclosed by the companies to determine the true and fair picture of its financial statements.

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