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Challenges to Application of Environmental Management Accounting Practices in Manufacturing Firms in Anambra State

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Abstract

This study focused on challenges to application of environmental management accounting in manufacturing firms in Anambra State. Specifically it determined challenges to effective application of environmental management accounting in manufacturing firms and strategies for improving the application of environmental management accounting in the firms in Anambra State, Nigeria. Two research questions guided the study and two null hypotheses were tested at 0.05 level of significance. Survey research design was used. Population for the study was 214, comprising 107 practicing accountants and 107 managers in manufacturing firms in the area of the study. Questionnaire was used for data collection. Data were analyzed using mean, standard deviation and t-test. Findings include 12 challenges to the application of environmental management accounting in manufacturing firms. These are lack of environmental accounting standards ($\overline{X}$ = 3.34), poor environmental legislation ($\overline{X}$= 3.35) and poor specification of environmental information ($\overline{X}$= 3.33), among others. Other findings are 13 strategies for improving the application of environmental accounting practices. These include, sensitizing management on the importance of being open to change ($\overline{X}$ = 3.27), provision of environmental accounting standards by professional bodies for uniformity of accounting reports ($\overline{X}$ = 3.29) and others. Based on the findings, it was recommended among others that environmental accounting standard should be well specified to enable manufacturing firms apply it in their accounting system.

Keywords: Environmental, Management, Accounting, Practices, Challenges, Manufacturing, Firms.

Introduction

The human race has sought ways to preserve and protect the environment against pollution and excessive generation of wastes which if not checked will affect future generation. To this end, a 17-point agenda called Sustainable Development Goals (SDGs) was developed by the United Nations during a summit in 2015 with the development agenda titled "Transforming our World: The 2030

Agenda for Sustainable Development." Sustainable development is a development that will meet the needs of the present generation as well as the needs of the future generations (Sola,Obamuyi, Adekunjo &Ogunleye, 2016). In agreement to the above definition, Ndubuisi-Okolo and Anekwe (2018) asserted that sustainable development is a development that promote and seeks for the progress of the environment, economy and society in general. In this study, sustainable development is a development that seeks for the well-being of the environment, society, economic (organization) and future generations. Therefore, sustainable development stresses on the concept of "Triple Bottom Line" to encourage businesses to manage and enhance their economic, social and environmental performance for sustainability.

Sustainability can be achieved when manufacturing firms conduct their activities with a view of protecting the environment and society instead of focusing on economic gains alone in every production activity (Doorasamy, 2014). The United Nations has required businesses and industries to play roles that will facilitate the achievement of sustainable development Goals (Jones, Wynn, Hillier & Comfort, 2017).This is because most of the environmental problems and challenges faced by the society today are caused by business organizations especially manufact-uring firms since their activities are environmentally sensitive.

Manufacturing, according to United Nations in Onuoha (2012), involves the transformation of inorganic or organic substances into new product through a mechanical or chemical process. In the same vein, manufacturing is the process of applying the right tools, machines, labour and material in the right quantity to transform them into goods and services either for commercial purpose or personal use (Ududechinyere, Eze, & Nweke, 2018). Therefore, any firm that is involved in the conversion of raw materials into finished/semi-finished goods or services to meet human needs and want is known as a manufacturing firm.

Manufacturing firms have contributed immensely to the growth and development of the economy through the provision of intermediate inputs, finished goods, job creation, stimulation of investment and innovation, gross domestic product, economic growth and development among others. (Hermana, 2016; Oburota &Ifere, 2017; Ududechinyere, Eze & Nweke 2018). However, despite the roles of manufacturing firms in the economic development of the nation, their activities have brought hazardous consequences to both the environment and the human population. Manufacturing firms exert much impact on the environment through factory processes, mechanisms and products, resulting to waste products, pollution, toxic wastes and emissions among others (Ezeibe & Umenweke, 2015). To validate the above statement, the report of Environmental

Investigation Agency in Adebambo, Ashari, and Nordin (2015) revealed that manufacturing firms are responsible for the generation of solid wastes, contamination of the water bodies and above all emission of carbon dioxide that causes hazards to the environment. Therefore, in a bid to achieve sustainable development goals, manufacturing firms should seek ways of protecting the environment by revealing the cost of the impact of their activities on the environment through environmental management accounting.

Environmental Management Accounting (EMA) involves identifying the financial and non-financial environmental related costs to improve the financial and environmental performance of an organization for internal decision making by management (Chang in Iredele & Ogunleye, 2017). Kumar, Jat, and Sharma (2016) observed that environmental management accounting practices are veritable tools that enable management plan, manage resources, control pollution so as to help an organizations to determine and compare the cost of preventing environmental damages using greener technologies, processes and products and what it will cost to remedy the damages caused by the impact of their activities on the environment.

The effective application of environmental management accounting practices by manufacturing firms would lead to reduction in wastes, energy and emission, use of natural resources among others which will also lead to reduction of firms' adverse impact on the environment (Arong, Ezugwu &Egbere, 2014). However, the authors further asserts that Nigerian business organizations are yet to apply environmental management accounting and its role in ensuring efficiency in the use of raw materials, energy and natural resources which depletes the environment. This can be attributed to the challenges in applying EMA because it is a new aspect of accounting. As a result, researches has shown that most of the manufacturing firms are still using conventional accounting system and thus they are not aware of their environmental costs and how those costs could be managed for sustainability (Okafor, Okaro and Egbunike, 2013; Jamil, Mohamed, Muhammad, & Ali 2015; Iredele & Ogunleye, 2017).

Most manufacturing firms therefore are not yet environmentally responsible giving the reason for high environmental threats in the society especially in Anambra state. Anambra state is one of the states in South East Nigeria and known as the hub for manufacturing activities. The manufacturing sectors surveyed in this study are those in chemical and pharmaceutical, plastic and foam, steel metal & iron, motor vehicle and miscellaneous assembly, electrical& electronics, pulp and paper, food, beverages & tobacco, textile and non-metallic minerals. These firms are located in three major cities namely: Onitsha, Awka and Nnewi which serves as the major center for

manufacturing activities and thus exact environmental impact in these areas. Most manufacturing firms in Onitsha do not have programmes for wastes treatment and thus they discharge wastes directly into the environment and into the water bodies. Such practices pose health threats to residents in the area. The unavailability of programme for effluents can be linked to none application of environmental management accounting practices which help firms to be aware of the impact of their activities on the environment. In agreement to the above, researches revealed that manufacturing firms are the major sources of pollutants which causes global warming and as such they need to apply practices that will reduce the impact of their activities on the environment (Smith & Perks, 2010; Wakulele, Odock, Chepkulei &Kiswili, 2016; Eshikumo & Odock, 2017)

Manufacturing firms all over the world tends to face varying challengesto effectivelyapply environmental management accounting practices in their accounting system.Such challenges include: attitudinal challenges, institutional challenges, financial challenges, informational challenges and management challenges which have made it difficult for them to apply environmental management accounting practices Chang, 2007;Ustad, 2010; Jamil, Mohamed, Muhammad, and Ali, 2015; Egbunike and Eze (2017); Karimi, Dastgir, and Arab Salehi, 2017; Iredele and Ogunleye, 2017; Krivačić &Janković, 2017; Hossain, Islam & Naznin, 2019).

These factors in varying degrees have prevented accurate tracking and tracing of environmental costs and thus pose challenges to the adoption of EMA in industries. Although past researches have reported the factors that challenge the application of EMA in other countries of the world, there is scare information on what restrict Nigerian manufacturing firms to practice EMA. Hence, since other researches like Das, (2016), emphasized on the need for a standardized environmental accounting practices and with legal enforcement for firms to apply EMA in their accounting system. The factors challenging EMA practices in manufacturing firms in Nigeria, with particular reference to Anambra State which is the hub of manufacturing firms in South-East Nigeria are unknown. When these challenges are unraveled and solutions proffered, the firms would be fitted to apply the practices for sustainability. The problem of this study, therefore, is to identify the challenges to the application of environmental management accounting practices in manufacturing firms in Anambra state and to identify the strategies to improve on the challenges.

Purpose of the Study

The general purpose of the study was to investigate the challengesto the application of environmental management accounting in

manufacturing firms (EMA) in Anambra State. Specifically, the study determined:

1. challenges to the effective application of EMA in manufacturing firms in Anambra State, Nigeria
2. strategies for improving the application of EMA in Anambra State, Nigeria.

Research Questions

The following research questions based on the specific purposes will guide the study.

1. What are the challenges to effective application of EMA in Anambra State?
2. What are the strategies for improving the application of environmental EMA in Anambra State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

$H0_1$. There is no significant difference between the mean responses of practicing accountants and managers on the challenges to effective application of EMA in Anambra State.

$H0_2$. There is no significant difference between the mean responses of practicing accountants and managers on the strategies for improving the application of EMA in Anambra State.

Methodology

***Design of the Study*:** This study adopted descriptive survey research design.

***Area of the Study*:** The area of the study was Anambra State. It was chosen for this study because most of the manufacturing firms within the South-East of Nigeria are located in the state majorly in Onitsha, Awka and Nnewi. These manufacturing firms cause pollution, toxic wastes and emissions leading to climate change and global warning. Therefore, there is need to look into their business activities to determine the challenges they have in applying EMA practices which will help them to protect the environment.

***Population for the Study*:** The population for this study was 214, comprising 107 practicing accountants and 107 managers from the selected 107 manufacturing firms. The lists of manufacturing firms and locations were obtained from the Manufacturers Association of Nigeria (MAN), Anambra/Enugu/Ebonyi Chapter directory collected on 11th March, 2019. Since the population of the study is manageable in size, no sampling was drawn.

***Instrument for Data Collection*:** A 26-item questionnaire was used to collect data. It was developed based on the literature specific purposes of the study review. The questionnaire was divided into two parts. Part 1 elicited information on the bio data of the respondents while Part 2 was further divided into two sections (A-B). Section A focused on challenges to effective application of EMA practices

while section B focused on strategies for improving the application of EMA practices. The questionnaire utilized four-point scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) with values as 4, 3, 2 and 1 respectively. The questionnaire was face-validated by three experts in University. Cronbach Alpha was used to determine reliability coefficient of the instrument. It yielded coefficient index of 0.89 and 0.86 for section A and B respectively with a grand reliability coefficient value of 0.88.

Method of Data Collection: Two hundred and fourteen copies of the questionnaires were distributed by hand to respondents, comprising 107 practicing accountants and 107 managers of the registered manufacturing firms in Anambra State. Out of 214 copies of the questionnaire administered, 202 were correctly filled and returned representing about 94% return rate.

***Method of Data Analysis*:** Data were analyzed using mean (X) and standard deviation (SD) for answering the research questions. The analyzed data were interpreted using real limit of numbers to answer the research questions as follows: Strongly Agree (SA) 3.50-4.00; Agree (A) 2.50-3.49; Disagree (D) 1.50-2.49 and Strongly Disagree (SD) 1.00-1.49. Hypotheses were tested using t-test at 0.05 level of significane.

Findings

Table 1: Mean Responses, Standard deviation and t-test of Practicing Accountants and Managers on the Challenges to Effective Application of EMA in Anambra State.

S/N	Challenges	$\overline{X}_{PA}$	SD_{PA}	$\overline{X}_{MG}$	SD_{MG}	X_{GM}	SD_{GM}	DEC	P-value	RMK
1	Management resistance to change	2.55	0.88	2.21	0.67	2.38	0.78	DA	0.39	NS
2	low priority of accounting for environmental costs	3.01	0.82	2.85	0.71	2.93	0.77	A	0.50	NS
3	perception of the insignificance of environmental costs in overheads	2.76	0.74	2.89	0.75	2.83	0.75	A	0.65	NS
4	Lack of environmental accounting standards by professional bodies	3.36	0.61	3.32	0.72	3.34	0.67	A	0.35	NS
5	Poor environmental legislation	3.39	0.60	3.31	0.64	3.35	0.62	A	0.13	NS
6	Lack of institutional and stakeholder pressure to apply EMA	3.38	0.69	3.33	0.63	3.36	0.66	A	0.58	NS
7	Low incentive for managing environmental costs	3.35	0.67	3.19	0.74	3.27	0.71	A	0.09	NS

Table 1 Contuned

8	Higher initial capital cost	3.28	0.78	3.18	0.73	3.23	0.76	A	0.73	NS
9	Poor research and development in EMA	2.51	0.82	2.60	0.94	2.56	0.71	A	0.13	NS
10	Poor specification of environmental information	3.39	0.61	3.26	0.62	3.33	0.62	A	0.24	NS
11	lack of integration of the environment into strategic planning	3.05	0.66	3.08	0.80	3.07	0.73	A	0.74	NS
12	lack of management support for environmental issues	2.65	0.60	2.31	0.52	2.48	0.56	DA	0.36	NS
13.	lack of environmental responsibility and accountability by management	3.02	0.44	3.06	0.35	3.04	0.40	A	0.58	NS
	Cluster Mean & Standard Deviation					**3.01**	**0.67**	**A**		

Key: *X_{PA} = Mean of practicing accountants, X_{MG} = Mean of managers, SD_{PA} = Standard deviation of practicing accountants, SD_{MG} = Standard deviation of managers, X_{GM}= Grand mean, SD_{GM} = Grand standard deviation, DEC = Decision, A = Agree, DA = Disagree, RMK = Remark.*

Table 1 shows that all the items except item 1 and 12 have their mean ratings ranged from 2.56 to 3.36. This means that the respondents agreed that the items are challenges to effective application of EMA practices in manufacturing firms in Anambra State. On the other hand item 1 and 12 had the mean of 2.38 and 2.48 respectiveely, indicating that the items were not challenges to effective application of EMA practices in manufacturing firms in Anambra State. Also, the standard deviation (SD) of all the items ranged from 0.40 to 0.78, which indicated that the respondents were close to one another in their opinions, and that their responses are not far from the mean.

Table 1 also shows that all the items have t-value of -0.67 to 1.69 with P-values ranged from 0.09 to 0.74 at 200 degree of freedom which is greater than 0.05 level of significance. These indicate that there is no significance difference in the mean responses of practicing accountants and managers on the challenges to effective application of EMA practices in manufacturing firms in Anambra State.

Table 2: Mean Responses, Standard deviation and t-test of Practicing Accounts and Managers on the Strategies for Improving the Application of EMA **in Manufacturing Firms in Anambra State.**

S/N	Strategies for improving EMA in manufacturing firms	$\overline{X}_{PA}$	SD_{PA}	$\overline{X}_{MG}$	SD_{MG}	$\overline{X}_{GM}$	SD_{GM}	DEC	P-value	RMK
1	Sensitizing management on the importance of being open to change	3.27	0.54	3.01	0.42	3.14	0.48	A	0.99	NS
2	Encouraging managements to prioritize accounting for environmental costs	3.28	0.52	3.22	0.48	3.25	0.50	A	0.74	NS
3	Enlightening management on the need to separate environmental cost from general overhead	3.36	0.52	3.33	0.57	3.35	0.55	A	0.72	NS
4	Provision of environmental accounting standards by professional bodies for uniformity of accounting reports	3.29	0.51	3.30	0.52	3.30	0.52	A	0.86	NS
5	Strict environmental regulations and monitoring as a means of ensuring firms apply EMA	3.36	0.64	3.33	0.49	3.35	0.70	A	0.69	NS
6	Adequate institutional and stakeholder pressure for application of EMA	3.37	0.70	3.56	0.50	3.47	0.60	A	0.03	S
7	Adequate incentive to firms who incorporate environmental protection strategies in their organization	3.40	0.66	3.38	0.55	3.39	0.61	A	0.83	NS
8	Creating and setting up budget for environmental research and development in EMA	3.26	0.50	3.25	0.60	3.26	0.55	A	0.90	NS
9	Relevant researches should be conducted on the effective way to apply EMA	3.31	0.54	3.28	0.59	3.30	0.57	A		NS
10	Adequate specification of all environmental information based on each group of environmental costs	3.43	0.65	3.37	0.60	3.40	0.63	A	0.52	NS
	Management Strategies							A		
11	Making policies available for management of manufacturing firms to integrate environment in their strategic plans	3.15	0.53	2.96	0.48	3.06	0.51	A	0.31	NS

Table 2 Contuned

12	Educating management that the benefit of applying EMA far outweighs the cost involved in its application	3.25	0.48	3.35	0.54	3.30	0.51	A	0.15	NS
13.	Enlightening managements of manufacturing firms on the need to adopt cleaner technologies to meet societal goal of achieving sustainable development	3.32	0.53	3.35	0.52	3.34	0.53	A	0.72	NS
	Cluster Mean& Standard Deviation					**3.30**	**0.56**	A		

Key: *X_{PA} = Mean of practicing accountants, X_{MG} = Mean of managers, SD_{PA} = Standard deviation of practicing accountants, SD_{MG} = Standard deviation of managers, X_{GT} = Grand mean, SD_{GT} = Grand standard deviation, DEC = Decision, A = Agree, RMK = Remark.*

Table 2shows that all the items had their mean ratings range from 3.06 to 3.47. This means that the respondents agreed that all the items are strategies for improving the application of EMA in manufacturing firms in Anambra State. Also, the standard deviation (SD) of all the items ranged from 0.48 to 0.70,indicating that the respondents were close to one another in their opinions, and that their responses were not far from the mean.

Table also shows that all the items except item 6 had their t-value ranged from -0.36 to 0.65 with a P-value of 0.15 to 0.99 at 200 degree of freedom which is greater than 0.05 level of significance, indicating that there is no significance difference in the mean responses of practicing accountants and managers on the challenges to effective application of environmental management accounting in manufacturing firms in Anambra State. However, item 6 had a t-value of -2.16 with a P-value of 0.03 at 200 degree of freedom indicating that a significant difference exists between the two groups of respondents.

Discussion of Findings

The findings of the study presented in Table one revealed that lack of environmental accounting standards by professional bodies; poor environmental legislation; poor specification of environmental information; lack of institutional and stakeholder pressure; low incentive for managing environmental costs among others are challenges to effective application of environmental management accounting in manufacturing firms in Anambra State. Furthermore, no significant difference was found in the mean responses of practicing accountants and managers of manufacturing firms on the identified challenges to effective application of environmental management accounting for sustainable development in Anambra State.

These findings are in line with the findings of Chang, 2007, Ustad

(2010),Karimi, Dastgir, and Arab Salehi (2017) Iredele and Ogunleye (2017) and Hossain, Islam and Naznin (2019) who found that the challenges to adoption of environmental management accounting are poor specification of environmental information, poor legislation, lack of institutional pressure and stakeholder power, low of incentive for managing environmental costs, lack of skills, knowledge and experience to identify and allocating environmental cost, resistance to change, and culture of the society in dealing with environmental issues. In the findings of Egbunike and Eze (2017), lack of environmental awareness by employees, shortage of environmental information and higher adaptation costs were the challenges in the adoption of EMA. The similarity in findings between the previous studies and the present study shows that these items are the general challenges affecting the application of environmental management accounting.

The findings of the study presented in Table two revealed that creating and setting up budget for environmental research and development in EMA; provision of environmental accounting standards by professional bodies for uniformity of accounting reports; strict environmental regulations and monitoring as a means of ensuring firms apply EMA; adequate specification of all environmental information based on each group of environmental costs; adequate institutional and stakeholder pressure for application of EMA; adequate incentive to firms who incorporate environmental protection strategies in their organization among others are strategies for improving the application of environmental management accounting practices in manufacturing firms in Anambra State. Furthermore, no significant differences was found in the mean responses of practicing accountants and managers of manufacturing firms on 12 out of the 13 identified strategies. However, significant differences were found in one of the items

The findings of this study are in congruent with the findings of Das (2016) who found that legal enforcement necessitating the urgent and pressing need to apply environmental management accounting practices to combat environmental problems should be made by government and other related agencies. This is because, according to Iredele and Ogunleye (2017), in encouraging firms to apply environmental management accounting practices, government and other stakeholders should play an active role in enforcing environmental laws and regulations; introduce tax incentives and other market-based environmental policy instruments as a reward for environmental performance by firms among others. Also Egbunike and Eze (2017) declared that to encourage firms to apply EMA, government and environmental agencies should develop environmental accounting guidelines and employees should be trained in

environmental accounting practices. The consistencies of these findings implies that these strategies are generally accepted as a way forward in ameliorating the challenges to effective and efficient application of EMA in manufacturing firms.

Conclusion

Environmental management accounting has been identified as a means through which any economy can achieve sustainable development. The activities of manufacturing firms have impacted negatively to the environment. Stakeholders and investors are not only interested in the financial position but on their environmental practices. The findings have shown that the manufacturing firms are facing challenges in the application of EMA and thus they are not environmentally responsible. Hence, strategies that can be used to improve the challenges were identified. It is hoped that if these strategies would be adopted by the manufacturing firms, they will be capable of solving the environmental management problems particularly in their immediate environment and the society at large.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Government through its agencies should mount pressure on manufacturing firms to adopt environmental management accounting as a means through which the environment can be protected and preserved for future generation.
2. Accounting bodies should work towards developing an environmental accounting standard and frameworks to enable companies apply EMA in their business activities as this was identified as one of the challenges to the application of EMA.

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