

## Must Firms Adopt Environmental Accounting? Adoption Challenges in Nigeria

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### Abstract

**Purpose of the article:** The purpose of this paper is to consider why firms find it challenging to adopt environmental accounting. The authors argue that environmental accounting is one of the important vehicles corporate bodies utilize in communicating with the external world. With the increase in complexities of the business world, the role of environmental information has been gradually increasing for making economic decision.

**Methodology/methods:** The research is exploratory in nature and only considers a small subset of Nigerian firms. However, several firms may be faced with varied challenges of adopting environmental accounting. The authors used four hundred (400) questionnaires and data obtained from the field survey was analyzed using t-values.

**Scientific aim:** The paper examined the adoption challenges of environmental accounting among Nigerian firms.

**Findings:** The study found that lack of environmental awareness by employees, shortage of environmental information and higher adaptation costs hinders environmental accounting adoption in Nigeria. Moreover, there are no clear-cut guidelines of environmental accounting on issues such as environmental costs, assets, liabilities, recognition and measurement of such costs.

**Conclusions:** Government and accounting regulatory bodies should play more active role in the development of environmental accounting and reporting guidelines by making it reliable and relevant to users. As a matter of fact, there should be a deadline imposed on Nigerian companies to fully adopt and implement environmental reporting guidelines. In addition, employees should be trained on environmental reporting techniques.

**Keywords:** environmental accounting adoption, environmental cost, sustainability reporting, economic development, Nigerian firms

**JEL classification:** M41, M48, D80

## Introduction

The environment is becoming a much more urgent economic, social and political problem and all over the world, there is the twin problem of promoting economic development and protecting the environment. Halil, Seda (2014) posited that proper accounting of environmental effects caused by business activities on the environment is a pre-requisite for sustainable development. In order to reduce the environmental effect caused by business activities, efforts have been made to develop a mechanism of incorporating environmental data into the accounting process. Senol, Ozcelik (2012) believed that the agitation to incorporate environmental data into the reporting process stems from the need to account for the interaction between firm and the environment at the micro-level.

This however, gave rise to the concept of “*environmental accounting*”. Environmental accounting has many meanings and uses; this is so because environmental accounting supports national income accounting, financial accounting, or internal business/managerial accounting.

According to Sajad *et al.* (2013), environmental accounting is a term used to refer to the addition of environmental cost information into existing cost accounting procedures and/or recognizing embedded environmental costs and allocating them to appropriate products or processes. Thus, environmental accounting is a way of incorporating environmental data into the accounting or reporting process of companies (Banerjee, 2006; Chatterjee, Mir, 2008; Pramanik *et al.*, 2008). In spite of the role played by environmental accounting in the reporting process, the adoption remains problematic

to most corporate organizations in Nigeria and the world over. The remaining part of this paper is divided into research problem and hypotheses formulation, review of related literature, methods, discussions and conclusion.

## 1. Research problem and hypotheses formulation

Accounting for the environment has been embraced by most countries, both developed and developing ones (Shukla, Nidhi, 2013). For most developing countries like Nigeria, the adoption of environmental accounting is still at its infant stage. In fact, environmental management literature suggests that the adoption of environmental accounting by companies typically leads to or favours good environmental performance (Annandale *et al.*, 2004; Melnyk *et al.*, 2003; Zhu, Sarkis, 2004). In contrast to the above views, regulatory attempts to promote environmental accounting is likely to face formidable challenges, since there is little or no profit motive for acquiring that type of information (Shukla, Nidhi, 2013).

Supporting the above views, Tijiani (2014) asserts that the reasons why companies in Nigeria have not fully adopted environmental accounting is as a result of series of challenges ranging from shortage of environmental information, lack of environmental awareness by employees, higher running costs, inappropriate infrastructure to adopt environmental accounting, stakeholders' challenge, higher adaptation costs (take up) and costs of adoption among others. This has however, constrained the adoption of environmental accounting in Nigeria and the world over. However, this paper is carried out with the view to investigating the challenges of environmental accounting adoption by Nigerian companies. In line with the above assertion, the following research hypotheses were formulated:

*H1: Lack of environmental awareness by employees do not constrain environmental accounting adoption by Nigerian companies.*

*H2: Shortage of environmental information do not hinder environmental accounting adoption by Nigerian companies.*

*H3: Higher adaptation costs do not significantly influence environmental accounting adoption by Nigerian companies.*

## 2. Review of related literature

### 2.1. Environmental accounting:

#### Definition, functions and dimensions

Environmental accounting aimed at achieving sustainable development, maintaining a favourable relationship with the community, and pursuing effective and efficient environmental conservation activities (Aras, Crowther, 2009). As noted by Arena, Azzone (2010), these accounting procedures allow a company to identify the cost of environmental conservation during the normal course of business, identify benefit gained from such activities, provides the best possible means of quantitative measurement (in monetary value or physical units) and support the communication of its results. According to Bergenwall *et al.* (2012), environmental conservation refers to the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities. The environmental impacts are the burden on the environment from business operations or other human activities and potential obstacles which may hinder the preservation of a favorable environment.

According to Bennett, James (2011), the functions of environmental accounting are divided into internal and external functions. Internal functions are carried out within a company. They assess the cost incurred by

environmental conservation activities and the related benefits, and are beneficial in improving the efficiency and effectiveness of environmental conservation activities and help in gaining an understanding of what impacts such activities might have on business operations. By using environmental accounting as an environmental information system, it plays the role of a tool to be employed by management and related business segments. External functions are effective in conveying information about a company's environmental activities to stakeholders.

Environmental accounting data is made public through environmental reports, and covers a company's stance on environmental conservation activities and concrete measures being taken by the company. By disclosing such information, society's trust and confidence in the company improves and aids in achieving a better public assessment. Therefore, environmental accounting not only fulfils a company's accountability to people outside the company, such as consumers, investors and local residents, but also facilitates attaining a fairer corporate assessment, not just from the standpoint of environmental conservation (Gnoni *et al.*, 2011). The basic dimensions of environmental accounting as observed by Gunasekaran, Spalanzani (2012) include relevance, reliability, understandability, comparability and verifiability.

- **Relevance:** Environmental accounting provides valid information related to a company's environmental conservation costs and benefits from associated activities, which contributes to the decision-making of stakeholders. In the spheres of relevance, materiality and significance are given considerable attention.

- **Reliability:** Environmental accounting eliminates seriously inaccurate or biased data and aid in building the trust and reliability of stakeholders.

- a) **Faithful Representation:** When disclosing environmental accounting data,

it should be represented accurately and faithfully.

- b) **Substance Over Form:** Information disclosure should not just be a mere formality of following steps laid out within these guidelines. When necessary, the company should determine an appropriate method of disclosure which conforms to and accurately describes the actual environmental activities being conducted.
- c) **Neutrality:** Information that is disclosed taking a fair and impartial stance.
- d) **Completeness:** The scope of environmental accounting should extend to all material and significant information for all environmental conservation activities.
- e) **Prudence:** Information that may be vague or unclear should be handled carefully and the nature, scope and grounds on which it is based should be made clear.
- **Understandability:** By achieving understandability of disclosure of necessary environmental accounting data, environmental accounting should eliminate the possibility of any mistaken judgment about the company's environmental conservation activities.
- **Comparability:** Environmental accounting makes it possible for a company to make year-on-year comparisons. Information provided should be comparable with different companies in the same sector.
- **Verifiability:** Environmental accounting data are verifiable from an objective standpoint.

## 2.2 Environmental Costs Types

Environmental costs according to Hart (2011) are one of the many different types of costs businesses incur as they provide goods and services to their customers. In the field of environmental accounting, environment costs can be classified as follows:

- **Conventional Costs:** The costs of using

raw materials, utilities, capital goods, and supplies are usually addressed in cost accounting and capital budgeting, but are not usually considered environmental costs (Environmental Protection Agency, 1995). However, decreased use and less waste of raw materials, utilities, capital goods, and supplies are environmentally preferable, reducing both environmental degradation and consumption of nonrenewable resources. It is important to factor these costs into business decisions, whether or not they are viewed as "environmental" costs.

- **Potentially Hidden Costs:** These are costs that lost their identity in overhead and they may be potentially hidden from managers: first are *upfront environmental costs*, which are incurred prior to the operation of a process, system, or facility (Okoro, Jeroh, 2016). These can include costs related to design of environmentally preferable products or processes, qualifications of suppliers, evaluation of alternative pollution control equipment, and so on. Whether classified as overhead or R&D, these costs can easily be forgotten when managers and analysts focus on operating costs of processes, systems, and facilities. Second are *regulatory* and *voluntary environmental costs* incurred in operating a process, system, or facility; because many companies traditionally have treated these costs as overhead, they may not receive appropriate attention from managers and analysts responsible for day-to-day operations and business decisions. The magnitude of these costs also may be more difficult to determine as a result of their being pooled in overhead accounts. Third, while upfront and current operating costs may be obscured by management accounting practices, *back-end environmental costs* may not be entered into management accounting systems at all. These environmental costs of current operations are *prospective*, meaning they will occur at more or less well defined points in the fu-

ture. Examples include the *future* cost of decommissioning a laboratory that uses licensed nuclear materials, closing a landfill cell, replacing a storage tank used to hold petroleum or hazardous substances, and complying with regulations that are not yet in effect but have been promulgated. Such back-end environmental costs may be overlooked if they are not well documented or accrued in accounting systems.

- **Contingent Costs:** Costs that may or may not be incurred at some point in the future is termed “*contingent costs*” can best be described in probabilistic terms: their expected value, their range, or the probability of their exceeding some dollar amount. Examples include the costs of remedying and compensating for future accidental releases of contaminants into the environment (e.g., oil spills), fines and penalties for future regulatory infractions, and future costs due to unexpected consequences of permitted or intentional releases. These costs may also be termed “contingent liabilities” or “contingent liability costs”. Because these costs may not currently need to be recognized for other purposes, they may not receive adequate attention in internal management accounting systems and forward-looking decisions.
- **Image and Relationship Costs:** Some environmental costs are called “less tangible” or “intangible” because they are incurred to affect subjective (though measurable) perceptions of management, customers, employees, communities, and regulators. These costs have also been termed “*corporate image*” and “*relationship*” costs. This category can include the costs of annual environmental reports and community relations activities, costs incurred voluntarily for environmental activities (e.g., tree planting). The costs themselves are not “intangible” but the direct benefits that result from relationship/corporate image expenses often are.

### 2.3. Challenges of environmental accounting adoption

Environmental reporting practices reflect that there is an increasing tendency among the corporate managers to disclose environmental information in their annual report to inform about their efforts to shareholders and public in general (Henri, Journeault, 2008; Hasan, Hakan, 2012). It is also clear that most of such environmental information reported by the companies is found to be non-financial (Senol, Ozcelik, 2012). Such information is mere description of the efforts made by the company. Halil, Seda (2014) believed that the information on amount of money spent for such initiatives and its material effect on financial results is grossly missing in such information. Again there is wide variation noticed in the style of reporting and theme the companies selected to report (Shukla, Nidhi, 2013). This can add to other dimension of the problem of lack of comparability and verifiability.

For integration, it is necessary for monetary measurement of environmental cost and benefits but all cost and benefit to the environment cannot be suitably measured in monetary unit, at least at micro level (Tijiani, 2014). Internal cost, like investment made by the corporate sector for minimization of losses to environment by product development, process development can be possible for monetary measurement but cost of externalities like degradation and destruction like soil erosion, loss of bio diversity, air pollution, water pollution, noise pollution, problem of solid waste, depletion of nonrenewable natural resources *i.e.* loss emerged due to over exploitation of non-renewable natural resources like minerals, water, gas, deforestation *etc.* and the environmental assets created by business like afforestation, bio-diversity conservation, water preservation *etc.* cannot be suitably measured in monetary terms (Boyd, 2015).

Furthermore, it is very hard to decide that how much loss has occurred to the

environment due to establishment of a specific business unit (Sajad *et al.*, 2013). This makes obstacles in the total integration of environmental accounting within the framework of existing GAAP. However, it is possible to disclose internal cost and benefit of environmental measures that is undertaken by a business unit and its material effects in reported profit by disclosing the way of recognition (Pramanik *et al.*, 2008). In case of externalities, like level emission, waste generation, afforestation *etc.* though monetary assessment is not possible but business can make some sort of quantitative measurement like for water management cubic kilometres, for emission level concentration of specified particles in terms of ppm., area of land afforested, quantitative facts on expenditures incurred of such activities, and targets set and achieved (Banerjee, 2006).

This kind of information can enhance authenticity and reliability of environmental information (Hoje *et al.*, 2014). On the other hand for such recognition of inter cost and other externalities a specific set of regulatory pronouncement is pre-requisite to have uniformity of accounting information. As in the present state environmental accounting and reporting is a voluntary rather than mandatory, in such situation everyone have tendency to depict the strength rather than the weakness.

#### 2.4 Theoretical framework

Scholars have considered different theoretical views to explain environmental accounting. In this section we considered the most prominent views: Agency and Stakeholder views. The principal agency theory argument related to environmental information is that corporate environmental responsibility can introduce an agency problem between a firm's management and its shareholders. Friedman (1970) asserts that engaging in corporate environmental responsibility is symptomatic of an agency problem or a conflict between the interests of managers and

shareholders. He argues that managers use corporate environmental responsibility as a means to further their own social, political, or career agendas, at the expense of shareholders. According to this view, resources devoted to environmental responsibility would be spent more wisely on efforts to increase firm efficiency.

Under the agency view, environmental regulation as well as voluntary environmental disclosure would only exacerbate environmental information. The agency perspective has been challenged by Freeman (1984) who, in the context of the stakeholder theory, pointed out that every corporation has relationships with many stakeholders and that these stakeholders both affect and simultaneously are affected by the firm's actions. These stakeholder groups include internal and external constituents. Like shareholders, the other stakeholders may place demands upon the company. Companies must address these demands or else face negative confrontations with non-shareholder groups, which can lead to diminished shareholder value, through boycotts, lawsuits, protests, *etc.* From a stakeholder theory perspective, environmental performance is assessed in terms of a company meeting the demands of multiple stakeholders.

In particular, stakeholder theory suggests that environmental information should be reflected in a firm's financial performance. This is based on the argument that serving the implicit claims of various stakeholders will enhance a firm's reputation, which will consequently lead to a positive impact on its financial performance. Under the stakeholder view, voluntary environmental disclosure will reinforce environmental information as it increases the exposure of environmental activity towards stakeholders. The role of environmental regulation would be at best ambiguous under this paradigm. Once the stakeholders are convinced of the benefits of environmental responsibility, stakeholder theory predicts that they will enforce

conducive behavior upon the company without legislation. If that is the case, government intervention will only create unnecessary regulatory costs (Blacconiere, Patten, 1994). According to this view, stakeholder pressure exerts a significant influence on companies' implementation of environmental practices while governmental pressures are less relevant (González-Benito, González-Benito, 2006; Wood, Ross, 2006; Rivera-Camino, 2007). At best, government intervention via environmental regulation can create environmental consciousness in society as a whole and in a later stage provide a benchmark for defining good/bad environmental behavior (Tietenberg, 1990).

### 3. Methods

We conducted a survey using questionnaire. This method was employed because it is most appropriate methods of investigating people's perception on emerging concepts (Creswell, 2011). Survey by questionnaire is suitable in ascertaining the challenges militating the adoption of environmental accounting. Survey by questionnaire conducted in this paper was extensive, since the issue under investigation is still open to empirical study, having few researches on challenges of environmental accounting adoption (Chatterjee, Mir, 2008; Annandale *et al.*, 2004). The study population comprised of all employees of forty (40) companies listed on the Nigerian Stock Exchange. The cadres of employees consist of top and middle level management like board chairmen, chief executive officers, managing directors and accountants. These cadres of employees were chosen given the fact that they are responsible and knowledgeable in environmental-related matters. Consequently, four hundred (400) employees were selected by means of purposive non-probability sampling technique. This sampling technique was employed because it was the appropriate

technique needed to gather the information for the study. Moreover, five (5) questionnaires were administered to each cadre, totaling ten (10) questionnaires administered to each cadre of employees of the selected companies. Data obtained in the field survey were structured into tables via Microsoft Excel Spreadsheet and was conducted in 2017. In addition, the t-test statistical tool was utilized in validating the relevant hypotheses of the study and analysis was done through the Statistical Package for Social Sciences (SPSS 22.0 version).

## 4. Discussions

### 4.1 Descriptive and Inferential Statistics

*H1: Lack of environmental awareness by employees do not constrain environmental accounting adoption by Nigerian companies.*

The result in Table 1 shows that the t-value of 3.087 is greater than the table value of 1.684. Therefore, the null hypothesis is rejected and the alternative accepted.

This implies that lack of environmental awareness by employees constrain environmental accounting adoption by Nigerian companies. The above result is further supported by the mean of 3.17 and 3.01 respectively for lack of environmental awareness by employees and environmental accounting adoption by Nigerian companies and standard deviation of 1.78 and 1.15 respectively.

### 4.2 Descriptive and Inferential Statistics

*H2: Shortage of environmental information do not hinder environmental accounting adoption by Nigerian companies.*

The result in Table 2 shows that the t-value of 4.091 is greater than the table value of 1.684. Therefore, the null hypothesis is rejected and the alternative accepted.

This implies that shortage of environmental information hinder environmental

Table 1. Result for Environmental Awareness and Environmental Accounting Adoption.

Variables	Mean Score	Std. Dev.	t-cal	t-tab	Df
Environmental Awareness (N=400)	3.17	1.78			
Environmental Accounting Adopt. (N=400)	3.01	1.15	3.087	1.684	388

Source: Authors' computation, 2017. ( $t(400)=3.087, P>0.05$ )

Table 2. Result for Shortage of Environmental Information and Environmental Accounting Adoption.

Variables	Mean Score	Std. Dev.	t-cal	t-tab	Df
Shortage of Environmental Info. (N=400)	3.01	1.51			
Environmental Accounting Adopt. (N=400)	2.08	1.52	4.091	1.684	388

Source: Authors' computation, 2017. ( $t(400)=4.091, P>0.05$ )

Table 3. Result for Higher Adaptation Costs and Environmental Accounting Adoption.

Variables	Mean Score	Std. Dev.	t-cal	t-tab	Df
Higher Adaptation Costs (N=400)	3.74	1.89			
Environmental Accounting Adopt. (N=400)	2.17	1.42	7.069	1.684	388

Source: Authors' computation, 2017. ( $t(400)=7.069, P>0.05$ )

accounting adoption by Nigerian companies. Furthermore, the above result is supported by the mean of 3.01 and 2.08 respectively for shortage of environmental accounting information and environmental accounting adoption by Nigerian companies and standard deviation of 1.51 and 1.52 respectively.

### 4.3 Descriptive and Inferential Statistics

*H3: Higher adaptation costs do not significantly influence environmental accounting adoption by Nigerian companies.*

The result as summarized in Table 3 shows that the t-value of 7.069 is greater than the table value of 1.684. Therefore, the alternative hypothesis is rejected and the null accepted.

This implies that higher adaptation costs significantly influence environmental accounting adoption by Nigerian companies. In addition, the above result is supported by the mean of 3.74 and 2.17 respectively for higher adaptation costs and environmental accounting adoption and standard deviation of 1.89 and 1.42 respectively.

More importantly, this study has shown that there are several challenges militating against the adoption environmental reporting among companies listed on the Nigerian Stock Exchange. These challenges among others include lack of environmental awareness by employees (see Table 1), deficiency of environmental information system (see Table 2) and higher adaptation costs by Nigerian companies (see Table 3). Perhaps, these challenges may have contributed to the reason why firms do not adopt environmental accounting in their reporting systems. Aside these challenges, environmental accounting adoption is still a matter of voluntary disclosure in Nigerian context, leading to a more permissible reason for Nigerian companies not adopting it. Nevertheless, the findings of this study conform to prior researches on environmental accounting adoption challenges (see Chatterjee, Mir, 2008; Annandale *et al.*, 2004).



## 5. Conclusion

Most of the Nigerian companies use to report environmental initiative in their annual report. However, such reporting is mere descriptive and nothing is disclosed about its financial implications and accounting policy of environmental cost. It is not possible to measure all environmental liabilities (bad) and assets (good) in monetary unit. As result it is not possible to integrate all environmental information with existing accounting system at micro level. However, it can be concluded that lack of environmental awareness by employees, shortage of environmental information and higher adaptation costs hinders environmental accounting adoption by Nigerian companies.

Moreover, due to absence of clear guideline of environmental accounting regulatory bodies, like environmental accounting

standard board on issue like environmental costs, environment assets and liabilities, recognition and measurement of such costs, assets and liabilities and its disclosure requirement, it is not developed as it is expected by stakeholder.

On the basis of the findings, it was recommended that in the near future, the government and accounting regulatory bodies should play more active role in the development of environmental accounting and reporting guidelines by making it reliable and relevant to users. As a matter of fact, there should be deadline imposed on Nigerian companies to fully adopt and implement the environmental reporting guidelines. In addition, employees should be trained on environmental reporting techniques and more environmental information should be provided by Nigerian companies.

## References

- Annandale, D., Morrison-Saunders, A., Bouma, G. (2004). The impact of voluntary environmental protection instruments on company environmental performance. *Business Strategy and the Environment*, 13, pp. 1–12.
- Aras, G., Crowther, D. (2009). Corporate sustainability reporting: A study in disingenuity. *Journal of Business Ethics*, 87(1), pp. 279–288.
- Arena, M., Azzone, G. (2010). Process based approach to select key sustainability indicators for steel companies. *Iron making and Steelmaking*, 37(6), pp. 437–444.
- Banerjee, B. (2006). Corporate environmental accounting and reporting. *Journal of Consumer Behaviour*, 2(2), pp. 169–184.
- Bennett, M., James, P. (2011). *The green bottom line in business and sustainability Development*. London, Earth Scan.
- Bergenwall, A. L., Chen, C., White, R. E. (2012). TPS's process design in American automotive plants and its effects on the triple bottom line and sustainability. *International Journal of Production Economics*, 140(1), pp. 374–384.
- Blaconiere W., Pattern, W.D. (1994). Environmental information and market reactions to environmental legislation. *Journal of Accounting, Auditing, and Finance*, 12(2), pp. 149–178.
- Boyd, J. (2015). The benefits of improved environmental accounting: An economic framework to identify priorities. *Discussion Paper*, pp. 98–49.
- Chatterjee, B., Mir, M. Z. (2008). The current status of environmental reporting by Indian companies. *Managerial Auditing Journal*, 23(6), pp. 609–629.
- Creswell, J. W. (2011). *Research design: Qualitative, quantitative and mixed research approaches*, (4<sup>th</sup> d.). Washington DC: Sage Publications.
- Environmental Protection Agency (1995). *An introduction to environmental accounting as a business management tool: Key concepts and terms*.
- Friedman, M. (1970). Emerald article: The social responsibility of corporate management classical critique. *American Journal of Businesses* 18(1), pp. 15–24.
- Freeman, R. E. (1984). *Strategic management: A*

*stakeholder approach*. London: Pitman Publishers Limited.

Gnoni, M. G., Felice, F. D. Petrillo, A. (2011). A multi-criteria approach to strategic evaluation of environmental sustainability in a supply chain. *International Journal of Business Insights and Transformation*, 3(3), pp. 54–61.

González-Benito, J., González-Benito, O. (2006). The role of stakeholder pressure and managerial values in the implementation of environmental logistics practices. *International Journal of Production Research*, 44(7), pp. 1353–1373.

Gunasekaran, A., Spalanzani, A. (2012). Sustainability of manufacturing and services: investigations for research and applications. *International Journal of Production Economics*, 1(4), pp. 35–47.

Halil, E. A., Seda, C. (2014). Corporate environmental disclosures in a developing country: An investigation on Turkish listed companies. *International Journal of Economics and Finance*, 6(2), pp. 1–17.

Hart, S. L. (2011). Beyond greening: Strategies for a sustainable world. In R. Starkey, R. Wilford, (Eds.), *Business and Sustainable Development*. London: Earth Scan.

Hasan, S., Hakan, O. (2012). *The importance of environmental accounting in the context of sustainable development and within IFRS evaluation*. 3<sup>rd</sup> International Symposium on Sustainable Development, May 31–June 01, Sarajevo, pp. 81–88.

Henri, J. F., Journeault, M. (2008). Environmental performance indicators: An empirical study of Canadian manufacturing firms. *Journal of Environmental Management*, 8(7), pp. 165–176.

Hoje, J., Kim, H., Park, K. (2014). Corporate environmental responsibility and firm performance in the financial services sector. *Korea Advanced Institute of Science and Technology, Working Paper, Series No. 2014-007*.

Melnyk, S., Sroufe, R., Calantone, R. (2003). Assessing the impact of environmental management systems on corporate and environmental performance. *Journal of Operations Management* 2(1), pp. 329–351.

Okoro, G. E., Jeroh, E. (2016). Effect of environmental and dismantling costs on firm performance among selected oil and gas companies in Nigeria. *Sahel Analyst: Journal of Management Sciences*, 14(5), pp. 14–26.

Pramanik, A. K., Shil, N. C., Das, B. (2008). Corporate environmental reporting: An emerging issue in the corporate world. *International Journal of Business and Management*, 3(12), pp. 146–154.

Rivera-Camino, J. (2007). Re-evaluating green marketing strategy: A stakeholder perspective. *European Journal of Marketing*, 41(11/12), pp. 1328–1358.

Sajad, G., Ayat, T. N., Behzad, G., Bahman, K. R. (2013). Environmental accounting: From concept to practice. *Journal of Basic and Applied Scientific Research*, 3(1), pp. 439–443.

Senol, H., Ozcelik, H. (2012). The importance of environmental accounting in the context of sustainable development and within IFRS evaluation. *3rd International Symposium on Sustainable Development*, May 31–June 01, Sarajevo, pp. 81–89.

Shukla, A., Nidhi, V. (2013). Environmental accounting and reporting in India: A comparative study of Bharat Petroleum Company Limited & Oil and Natural Gas Company Limited. *Pacific Business Review International*, 5(7), pp. 17–32.

Tietenberg, T.H. (1990). Economic instruments for environmental regulation. *Oxford Review of Economic Policy*, 6(1), pp. 17–33.

Tijiani, A. (2014). *A study of sustainability in the oil and gas supply chain*. A thesis submitted in partial fulfilment for the requirements for the degree of Doctor of Philosophy at the University of Central Lancashire, pp. 1–363.

Wood, D., Ross, D. G. (2006). Environmental social controls and capital investments: Australian evidence. *Accounting and Finance*, 4(6), pp. 677–695.

Zhu, Q., Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 2(2), pp. 265–289.

**Received: 4. 11. 2017**

**Reviewed: 5. 12. 2017**

**Accepted: 27. 12. 2017**

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