

The Role of Environmental Accounting in Sustainable Development Empirical Study

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Abstract

The primary aim of this study is to identify how environmental or green Accounting could contribute and ensure sustainable development. It is a descriptive study which has investigated about the environmental accounting and sustainable development from the existing literature. The result indicated that most organizations often ignore large environmental costs. The sound green practice accounting is required. It has also been noted that accountants have unquestioned authority in the field of financial reporting for rights obligations arising under emissions trading schemes in the financial carbon accounting. Finally, the overall results summary of the review shows that the good practice of environmental accounting is vital for sustainability development, especially for focusing on environmental and environmental taxes, costs, and appreciation of ecosystem services, the cost of carbon dioxide, and the cost of water pollution which ensure the sustainable development.

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1 Introduction

The business organizations nowadays have operated in a world which expects them not only to perform the economic functions by providing services and good but also to take the environmental and social responsibilities and roles (Panwar and Hansen, 2009).

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In 1970, the environmental accounting has emerged as a consequence of a growth in environmental consciousness and concerns about environmental and social welfare (Khalid, Lord & Dixon). It is easily existed through sustainability and annual reports as well other reporting media, in comparison, management accounting information that is concerned to operations is considered to be confidential and internal (Weale, 1991).

Nowadays, many companies face environmental problems and looking for appropriate practices to report and to spread information to popular opinion. The problem of environmental pollution is one of the most significant problems of the current human society, which is very intense.

(Amiri et al, 2014). Therefore, having a balance between the financial performances with sustainability is a major challenge in the economic environment (Jamali, 2006).

Environmental accounting is that field which deals with the resource use, communicates and measures cost of national economic effect or company effect on the environment (Deegan, 2013b). The costs have included clean up costs or remediate of clean polluted sites, environmental penalties and taxes, buy of techniques that prevent pollution and costs of waste management. The system of environmental accounting includes two types of accounting, the first one is environmentally differentiated conventional accounting and the second one is ecological accounting. In environmentally differentiated accounting, we measure the impacts of the natural environment on a company in financial terms while ecological accounting measure the company impact on the environment but according to physical measurements. (Zhan & Zhang, 2013).

The development and survival of the organizations depends on the operational efficiency and financial performance, but that is not enough for business to achieve the continuous growth goal. therefore, the corporations responsibility is no longer viewed as only economic performance as it is expected for the organizations to take into account the environmental and social responsibility (Busco et al., 2010).

In the 1990, "accounts of sustainability" grabbed the global attention (Gray, 2010). Accounts were no more potentially hidebound things, broadly articulated through indefinite notions of responsibility and accountability. nowadays; they became the contested terrain of global planetary violation of human and other species and social justice addressed through the sustainable development. such concerns, do not directly related to system-wide threat that deals with life and death such as what is to be for human, it should engage with humanity and responsibility to the planet which related to the sustainable development (Ying, Gao, Liu, Wen, & Song, 2011).

The environmental activities and costs are existed in the systems of transitional accounting but the assumption that they were unimportant so there activities and costs ate hidden in overhead expenses (Bennettand and James, 1998).

The Environmental Accounting Historical development and Basic Concept

The environmental accounting is related to eco-auditing systems and environmental information. Environmental accounting is an important tool to understand the role which played by the natural environment in the economy and can contribute in the process of decision making .the environmental accounting could assist the business organizations in utilization and planning of the best available technology, and may contribute as a review role and add element of external quality control to the administrative system (Shelton, 2004).

Environmental accounting represents the subsection of accounting that related to systems, activities, methods, and recording analysis of environmentally ecological impacts of a determined economic system also it emphasizes on two sides of environmental accounting, the non-monetary and monetary aspects (Burrirt, et al., 2002). Monetary data includes the material product cost and non-product outputs, waste and emission control expenses. The contents of monetary data are the substance expenses of product and non-product of outputs, emission and waste control costs and the environmental management cost and prevention, development and research cost .in comparison, the environmental or physical includes all information about material inputs such as auxiliary materials, packaging materials, water, and energy. etc and outputs such as hazardous waste, solid and water waste, and air emissions. (Sumiani, Haslinda, & lehman, 2007).

The environmental accounting deals with social and environmental impacts, restrictions and regulations, safe, economically viable energy and environmentally sound. Its role is to treat the environmental problems and may affect in achieving the sustainable development in any state in the world .also, it has an impact on the behavior of the company in facing the issues of environmental and social responsibility. Sometimes, environmental accounting has been referred as green accounting (IUCN, 2011).

Environmental accounting began in unexpected period of time. The four stages that the development environmental accounting had gone through: from 1970 to 1980 is the commence of the first researchers in environmental accounting area, from 1981 to 1994 there are arguments concerning the role of accounting in the exposure of information regarding environmental activities. The interests of analysts for this area got expanded during this period; there was a focus on the issue of environmental accounting (Vasile & Man, 2012).

The period from 1995 to 2001 was the stage of maturation of environmental accounting. Environmental information was important and taken into account and environmental audit has launched. Furthermore, in developed countries the environmental accounting had been discussed in both practically and theoretically ways (Vasile & Man, 2012). From this period of time it is the beginning of growth of the studies, the name of this period called "cornerstone" of environmental accounting and the researchers of this area are began to pay more attention to this domain, the studies are then starting to grow .

It is deemed that the important environment accounting function is to provide the environmental costs to the corporate stakeholders who can identify ways to reduce or avoid those costs and in the same times achieving environmental quality improvement (Green Accounting: Environmental Accounting, 2011).

Environmental accounting covers all the fields of accounting that respond to the environmental issues .also, we use green accounting based on the natural resources (Ieneiu, Matis, 2010).

Moreover, the reporting of environmental information and rules about environmental accounting was issued, from 2002 till now, (Vasile & Man, 2012). the researches about environmental accounting grows and the articles and studies in this domain are much which gives significance to the research area development .The researches in environmental accounting have grown considerably because of the importance of environmental issues . In environmental accounting there are new sub-fields which were developed as environmental management accounting and environmental audit.

It is important to manage the economic and environmental accounting by the implementation and development of accounting systems related to the suitable environment (The Convention, Arhus, 2011).

Sustainable Development

Generally, the sustainable development concept has been understood at the international level and it is very difficult to be applied at the organizational level (Gray and Milne, 2002).

Sustainability related to morally, and includes the arrangements of humans and their effect on a natural and social environment which leads to justice and its concerns to death, life, oppression and suffering. Sustainability includes both a social and ecological concept, compatible with organizational or corporate boundaries (Stechemesser & Guenther, 2012).

Wilson (2003) indicated that the sustainable development concept is the corporate goals in social, economic and environmental dimensions; corporate

social responsibility provides the ethical motivation to why we need to achieve the sustainable objectives. (Wilson, 2003).

Sustainability has been defined as the situation in which the organization must achieve the highest performance in social, economic and environmental field. There is a problem in this idea where no clear balance in the performance that achieved in the separate area, also, it is hard to evaluate the sustainability and acceptability of the environmental and social performance (Gray, 2006).

Sustainability refers to a way of existence (Staniskis & Stankisiene, 2006). There is not a single “sustainable” position – it possibly can be accomplished by as many practical solutions. The sustainable state will be in the outcome of communications between societies, individuals, organizations, and states (Solomon and Thomson, 2009).

Corporate social responsibility and corporate sustainability are considered commonly the same and these two terms are used often interchangeably, because the belief that corporate social responsibility is the corporate approach to sustainability (Bansal 2005, Ransburg 2011). Also, the first term has suggested a long term perspective for the purpose of increasing the base capital of corporations.

Sustainability related to environmental management or social responsibilities, and it refers to a term that offers no threat to corporate activity and situation. The sustainability development is that development that meets the present needs without compromising the future generation's ability to meet their needs. This is because the ambiguity of sustainability development definition which has been given a wider meaning to comprise a large number of ideas. For different users, it holds their own purposes and meaning (Thornton, 2013).

Corporate sustainability has been derived from the total sustainability and from sustainable development and the organizational approach to achieve sustainable development is in corporate sustainability. sustainable development consists three dimensions (social , environmental and economic) which interact with each others (Danchev ,2006).

2 Methodology

This is a descriptive study which has investigated about the environmental accounting and sustainable development from the existing literature, and it was conducted a search by environmental accounting application of sustainable development in various databases online Such as Emerald ,Science Direct, Google Scholars and Scopus, Etc. This study indicated to a number of journal articles, conference and other generic work, which has been conveyed to decide any

materials should be incorporated into this search. After reading the most related articles that they have gathered, it was chosen the best that fit with the aims of the present issues about environmental accounting and sustainable developments.

Empirical Evaluation of Environmental Accounting and Sustainable Development

This part deals with various studies on the international and national levels regarding to the environmental or green accounting and sustainable development. Deegan, C. in 2013 indicated that organizations must provide accounts not only these accounts related to financial performance, but for environmental issues and performance, similarly, the authors reject the traditional suggestion of financial reporting frameworks. It also concentrates on some mechanisms, such as cap-and-trade systems to solve environmental and social environmental problems that occurred by the market. (Deegan, 2013).

P. Bartelmus in 1992 has analyzed accountability of socio-economic policies for environmental effects in the heart of sustainable development. Integrated economic-environmental accounting evaluates certain parts of the economic growth sustainability in terms of natural produced capital maintenance. Comprehensive development analysis involved further noneconomic goals that do not related to monetary valuation. The social assessment of these goals by methods of norms, standards, and targets is necessary and required for integrated improvement. In 2013 the author also has described the meaning and techniques of environmental accounting at the national level and has addressed the role of energy in accounting and sustainability analysis (Bartelmus, 2013).

S. El Serafy in 1997 attempted to accommodate all environmental changes .the national accounts are much more beneficial economically than environmentally. The author states that green accounting could ensure sustainability, which should be regarded as a step leading definitely too environmental sustainability. (L. Serafee, 1997). D. Ellison, M. Lundblad, et al. In 2011 attempted to set up effective strategies in terms of cost for setting that mitigating the effects of climate change and the efficient use and balanced forest resources. (Ellison, Lundblad, & Petersson, 2011).

The protection of biodiversity and promote ecosystem, harvested wood Products (HOPE) and the use of bioenergy must be maintained. The data has suggested that the benefits of the inclusion of national and International accounting and emission trading mechanisms such as a broadly based carbon accounting strategy are far outweigh potential disadvantages (Ellison, Lundblad, & Petersson, 2011).

In 2001 R. P. Anex L.D Englehardt has used a predictive Bayesian to evaluate highly uncertain environmental and contingent expenses. An environmental Accounting method frequently ignores the representation of environmental costs,

and costs stipulated by particular earlier events. Bayesian predictive approaches provide the probability of the distributions for the amount of interest instead of the parameters thereof. The implementation of the spread sheet of the previously proposed Bayesian predictive model extended to represent the contingent expenses. (Anex & Englehardt, 2001).

K. Herbohn in 2005 studied the experiment of reports by using techniques of FCEA valuation undertaken by the Australian Government departments that deal with management of publicly owned forests. The implementation includes the reactions of directors and other stakeholders, providing opportunity to think critically on the empirical findings to expand the present empirical knowledge of reporting of corporate social responsibility.

In 2006 P. De Beer and F. Friend have conducted a case study on the life cycle assessment of a functional unit of one million cigarettes by using the EEGECOST model to advance environmental accounting in South Africa. The model determines records and assigns internal and external environmental expenses to five identified expenses types, classified into several environmental media groups. It also helps in the capital budgeting process for alternative investments (De Beer & Friend, 2006). In addition, C. Deegan in 2013 has attempted to enhance the idea of frameworks of traditional monetary reports and also has attempted to solve social and environmental problems that were effectively created by the markets. there are doubts raised about the role of the accounting profession in contributing to broad-based corporate accountability, this paper concludes that there is a doubts of the role of accounting and the business educators in instilling some form of personal social responsibility (Deegan, 2013).

In 2007 S. Dietz and E. Neumayer have explained on the most recent worldwide handbook on environmental accounting. The system of Economic Accounting and Integrated Environmental or SEEA (United Nations, European Commission, International Monetary Fund, Organization for Economic Co-operation & Development and World Bank. The Handbook of National Accounting) could be used to measure strong and weak sustainability. The authors asserted on the significance of understanding the conceptual differences among strong and weak sustainability. Then the outline is considered as current best practice in measurement. in 2005 J. Dillard, D. Brown, et al. considered a framework beneficial for improving environmentally illuminating management and accounting data systems that consider alternative environmental perspectives. The framework can be utilized to create models representing various levels of environmental illumination, and as such, can give general direction for moving collectives and organization toward a more environmentally responsible position (Dillard, Brown, & Marshall, 2005).

H. Böttcher, W. A. Kurz, et al. in 2008 studied the reason that helped to occur changes in carbon stock related the disturbance in forest biomass (before 1990). Those changes in forest management could be distinguished in present. Additionally, the authors calculated the results of various accounting stock for the size and directions of accountable stock changes in European countries in the period 2013–2017 (Böttcher, Kurz, & Freibauer, 2008). In the sense that the information has been beneficial for it. The value of the impacts of carbon dioxide depends on asset value as opposed to rental values. They also introduced a discussion of the process to perform the plan in the face of uncertainty (Cairns & Lasserre, 2006).

H. Ahrens and Kantelhardt presented in 2009 an outcome of form" on the order of the various options for the use of land and to discuss the implications of rural plans and agro-environmental policies. In agricultural output, the sensitive areas (eco-sites) are environmentally and used to get the farmers to adapt with environmentally production in response outside of environmental site requirements. Then, it is important to the completion of the environmental goals at the economic and social levels. (Ahrens and Kantelhardt, 2009).

In 2010 Figueroa B, E., C. Orihuela R, et al. has examined green accounting and sustainability of the Peruvian metal mining sector. The authors have used model of green economic income as tool for measurement. The results indicated that the total of natural capital loss represents between 31% and 51% of the metal mining GDP and between 2% and 4.9% of Peru's GDP. furthermore, correcting the usual GDP measure produced by the traditional National Account System (NAS) for the total of natural capital loss which caused by mining activities .it is showed that there is overestimated of GDP traditional measure by 51–64% which is the real economic income produced by Peruvian's metal mining sector during the period 1992–2006 (Figueroa B, Orihuela R, & Calfucura T, 2010).

M. J. Jones in 2010 has developed multi layered theoretical model to support environmental accounting and to report about severe environmental risks; corporate responsibility. The results of this study indicated that there is a need for immediate actions to address the threats of environmental problems by accountants and managers, the traditional accounting form which narrowly focuses on the account numbers does not reflect the environmental effects of organization activity, and there is a need to disclose the environmental performance to stakeholders (Jones, 2010).

Horvath indicated that environmental accounting could not be outside the social and sustainability integration challenge. environmental accounting is a tool for sustainability and could help in the management of social , ecological and economic challenge in a world which full of poverty economic crisis and melting icebergs .(Horvath,2011)

J. Andrew C. Cortez in 2011 explored the dominant environmental discourses which can effect and shape carbon disclosure regulations. The disclosures related to carbon which have increased significantly in the past five years, and many of them remain voluntary disclosures. This study is both establishing practices of carbon disclosure self-regulation and the role of this type of information might be in climate change which related to decision making. There is a focus on the Carbon Disclosure Project (CDP) and the use of greenhouse gas (GHG) protocol as a reporting model (Andrew & Cortese, 2011).

Özçelik and Şenol indicated that Environmental accounting is a tangible tool in the sustainable development .Environmental accounting or "green accounting" is required in social responsibility of the companies. The significance of the environmental accounting has been increasing because of growing of environmental troubles, economic, social and technological development. the financial transactions reporting must be recorded and concerned about environmental activities which is necessity, this is a accomplished process in report during environmental accounting , the Environmental accounting has been practicing between the public production , from connection about environmental aspects this will provide an important contribution for sustainable development. The environmental cost must be controlled a, according to the types of environmental costs that should be included in the accounting information system (Özçelik and Şenol, 2012).

In 2012, F. M. Khaled et al have achieved implementation of the level of environmental Management Accounting (EMA) in environmentally sensitive industries companies in Malaysia and also have gained insight into the pressure for implementation. The authors found that this implementation was motivated to reduce costs instead of environmental conservation. The reactions of companies to the environmental issues emerges from the of customers' pressure who want environmentally sensitive workplace perspective, procedures and processes in companies (Khaled, et al., 2012).

In a study conducted in Malaysia, it has showed that we need to introduce the course of the environmental depletion and natural resource in several universities. Conducting research about this issue is important .The study also indicated that the education of the environmental accounting is nowadays important in. We need to care about this course for the interest of environment and sustainable development process. The government should study this issue extensively to have good .Nowadays, most of the government tries to calculate and introduce these environmental accounting systems in their policy. It bears much importance with the sustainability issues. The government should encourage companies and organizations to deal with the environmental accounting and auditing systems (Mohammad, 2012).

F. Ascui and H. Lovell in 2012 have analyzed the competency in carbon accounting as been characterized and asserted by various performing actors and groups. In particular. The concern is on the role of the accountancy function in carbon accounting , outlining its engagement over time ,and its association with different groups required in carbon accounting , The paper based on recent work demonstrating that different framings and exercises were related with carbon accounting , prompting to clashing perspectives on what it implies, how it ought to be done, and who ought to be included, The authors found that, accountants have an important role in the domain of financial accounting under schemes of emissions trading in financial carbon accounting. (Ascui& Lovell, 2012).

Hernádi indicated that the companies have an important role in achieving sustainability. Their current activities not only have an effect on today's world but in the future as well .Now, companies themselves are slowly in understanding this; but few know how to achieve corporate sustainability Accounting can offer help in this attempt. However, traditional accounting systems do not deal with accounting for social and environmental effort and can not demonstrate them. For this reason sustainability accounting is going beyond green accounting and should be emphasized by researchers and the concerned parties. The decisions must be based on the information provided by sustainability accounting that contributes in economic, social and environmental (Hernádi, 2012).

Contrariwise, K. Stechemesser and E. Guenther in 2012 tried to define carbon accounting through a systematic review of the literature that differs with points of view and research trends. According to this review and the use of qualitative data of computer- assisted software and according to the results, carbon accounting definition is suggested to be used by academicians in research. However, to set up carbon accounting in companies, the legislators must specify mandatory and voluntary accounting (Stechemesser and Guenther, 2012).

R. Gray in 2013 indicated that conventional financial accounting is mostly related to the economic fields, and is not very logical practice as any space for social or environment matters.

F. Asdrubali, A. Presciutti, et al. in 2013 asserted on local actions that are fundamental to affect worldwide reduction of greenhouse gases (GHG) emissions “think globally, act locally”. However, local authorities needs detailed information on their GHG emissions and their sources in order to plan and accomplish influential and sustainable actions, On the other hand, A Ball in 2007 conducted a case study based on Canadian City Council and indicated that the environmental accounting has been used by employees to have an organizational response to environmental issues. The results give questions about the process to assess the intervention of environmental accounting, and about the research role in

environmental development related to the inside of the organization (Ball, 2007).

in 2013 K. L. Christ and R. L. Burritt seek to expand current knowledge by examining whether organizational context can be used to promote a greater perception of EMA utilized by Australian organizations, according to emergency theory, a research framework was developed that seeks to identify under which conditions were the organizations more likely to participate with EMA activities, both now and in the future. A web-based survey of Australian accountants in business conducted in order to test this framework. The proposed information is presented and future EMA utilize was related with environmental methodology, organisational size and environmentally-sensitive industries as opposed to expectation organizational structure was not observed to be related with accountants perception of EMA used in their organizations. The results support the possibility for further research to increase the current knowledge and understand reasons behind EMA improvement (Christ & Burritt, 2013).

In 2013 B. Edens and L. Hein specified four key methodological challenges in developing ecosystem accounts, such as, the definition of ecosystem services related to accounting, , the treatment of degradation and rehabilitation, distribution to institutional sectors, and valuing ecosystem services that are consistent with SNA principle. The authors analyzed the different perspectives taken on these challenges and present various suggestions to bargain with the challenges in developing ecosystem accounts. These suggestions comprise several aspects, including present an accounting approach that perceives most ecosystems which firmly affected by individuals, and the ecosystem services rely on natural processes and also human ecosystem management. Ecosystems depend on the type of ecosystem service. Additionally, this study introduced a predictable approach for recording degradation and applying monetary valuation approaches relating to accounting (Edens & Hein, 2013).

In a study in Serbia, the results indicated that environmental accounting has gained importance in the end of 20th century when consciousness about sustainable development and growth became the elementary goal of all business organizations .regarding the measurement system, the accounting has its role in the development of measures to promote the sustainable growth of a company and to evaluate sustainability as a goal of accounting. Unfortunately, Serbia was at the edge of these processes because stakeholders still believe that profit is the elementary motive for business activities. (Knežević, 2014).

In a study of Amiri in Iran, the results indicated that there is a necessity to apply the environmental accounting as an effort to protect the environment. In case of the establishment of an ideal environmental accounting system in Iran, for sure,

accountants can be a strong helper for government related to economic and financial controls. To achieve this purpose, it is necessary to identify and define objectives and functions of environmental accounting carefully and to find and formulate standards, rules and measures on basis of reasonable and practical principles. Thus, professionally qualifying circles should take responsibilities for formulating and regulating professional rules and particularly standards of environmental accounting (Amiri, 2014).

The required actions for environmental impacts reduction is important in the commitment of sustainable development .sometimes, the companies do not keep the accounts related to identifying the operations on the environment. The financial elements about the environment are provided along with the accounting items so no information to help in calculating the environment results. There is a special important to total capital as a primary information system of national accounts as it has been considered as a controller of production process and resource consumption. (Ionescu et al, 2014).

In India, Environmental accounting is in preparatory stage, whatever shows in the record is more or less is consistence of the relevant regulation and rules in the act. Unless normal people in India are not made aware to environmental safety. Accounting development in this regard is doubtful. The companies must get ready to environmental policy, take steps s to control pollution, compliance with rules and organize that related to the rules and regulations. Environmental aspects in the annual statements should mention sustainable development of the country; a well-defined environmental policy as well proper accounting procedures and follow-up are necessity (Malik and Mittal, 2015).

3 Conclusion

The primary aim of this study is to learn how environmental or green Accounting could contribute and ensure sustainable development .Researchers have agreed to develop the ecosystem accounts by explaining the definition ecosystem services in the context of accounting, allocating institutional sectors; and the treatment of degradation, rehabilitation and ecosystem services.

The interventions and mechanisms of emissions t is one of the essentials matters. Furthermore, it was suggested to conduct further studies related to sustainability and sustainable development.

This study also revealed that most organizations often ignore large environmental costs. It has also been noted that accountants have unquestioned authority in the field of financial reporting for rights obligations arising under emissions trading schemes in the financial carbon accounting. Finally, the overall results summary

of the review shows that the good practice of environmental accounting is vital for sustainability development, especially for focusing on environmental and environmental taxes, costs, and appreciation of ecosystem services, the cost of carbon dioxide, and the cost of water pollution which ensure the sustainable development.

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