

Environmental Reporting and Sustainable Development: A Reflection of Practices of Listed Companies in the Manufacturing Sector of Bangladesh

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Abstract: *Environmental issues and sustainable development gathers great drive in the recent era both for developed and developing countries. The objective of this study is to explore and accumulate all the relevant concepts of environmental accounting as well as identify the scenario, significance, and challenges of its proper practices in the listed companies in manufacturing sector of Dhaka Stock exchange with accelerating the goal of sustainable development. To fulfill the objectives, the study did qualitative research using content analysis in the year 2019 and has collected data on 99 listed “A category” companies from 8 different manufacturing sectors, to reveal the specific environment, sustainability, and corporate social responsibility related disclosure, and to uncover the actual scenario of environmental reporting. The research concludes that in the manufacturing sector financially secured companies also have very pitiable voluntary disclosure (mostly qualitative) under different framework patterns. Thus the study observed the lack of a standard framework for reporting environmental disclosure and suggests an obligatory standard framework should be developed for all the companies. The research also recommends improving ethical practices, imposing environmental taxes and subsidies, and developing a proper management accounting system to assess the appropriate costs of different environmental degradation, so that the goal of sustainable development can be achieved in Bangladesh.*

Keywords: *Environmental accounting, Environmental cost, Environmental Accounting Disclosure, Sustainable development, Environmental Reporting*

Introduction

Environmental reporting delineates an inextricable link between environment and economy, can reckon the use of natural resources to economic improvement by measuring the costs arisen due to different environmental pollution and degradation. Proper accountability of natural resources can administer natural resource depletion and also expedite sustainable development. It is beyond any argument that the position of environmental reporting is extreme to achieve sustainable development goals. The level of understanding of social and environmental accounting from a theoretical perspective has been enriched since 1970s and contributed to developing a sustainable environment (Gray, 2002). With the theoretical development of accounting for sustainable environment, the concept of organizational reporting also extends

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their level of the area in the global, social, and environmental issues, whereas regional and the organizational purpose were the earlier concerned issues only (Gray, 2010; Hopwood, Unerman, & Fries, 2010; Schaltegger, Bennett, & Burritt, 2006; Unerman, Bebbington, & O'Dwyer, 2007).

On the 1st July of 2015, Bangladesh entered into the zone of the lower-middle-income country with achieving remarkable changes in the poverty-reducing rate and also maintaining steady economic growth for the last few years. A huge number of policies have been developed by authorities to move forward a sustainable development country by 2041. It is revealed around 3.4 percent of national GDP had been lost annually because of environmental risk in urban areas of Bangladesh (World Bank, 2018). Manufacturing industries are producing huge hazardous wastage that creates air, oil, and water pollution and is one of the key factors for environmental depletion. This motivates the authors to do research on this topics. The research believes that developing a standard waste management system in each industry, assessing the appropriate environmental cost for the depletion of natural resources can move forward the country to ensure sustainable development and Environmental Reporting (ER) practices can accelerate to grasp green policies for the sustainable development of future Bangladesh. The objectives of the study are as follows:

- To gather all relevant concepts of environmental reporting and sustainable development. In this regard, the discussion would highlight the concepts of environmental accounting, environmental cost, environment history, the environmental framework for different countries and environmental laws in Bangladesh.
- To established the involvement between environmental reporting and sustainable development.
- To identify the specific qualitative and quantitative disclosure (related to the environment, sustainability, and corporate responsibility) in the financially well-known companies in the manufacturing sector of Bangladesh.
- To understand the overall scenario of environmental reporting in the manufacturing industry of Bangladesh.

Environmental Accounting

According to CICA (1993), Environmental Accounting (EA) is a potential and rising field, aiming to identify measure, and communicate the costs of an organization due to probable impact on the environment in the accounting system to increase the possibility of sustainable development. EA finds out the appropriate environmental costs to lessen the company's environmental impact in optimum economic costs and develop a strong environmental management accounting system. EA uses financial and non-financial information to find out the optimum environmental cost and improves the corporate activity in protecting

the adverse effect on the environment as well as the economic performance in attaining a sustainable business.

EA is also known as green accounting, incorporate economic and environment-related data of a firm by calculating ecological consequences on the environment, and finally accumulate the overall environment activity-related information on the annual report by an appropriate set of accounting procedure. Thus it is recording, reporting, and analyzing the environmental events that have economic and ecological impacts on defined economic systems. According to Deegan (2013), EA can identify the use of natural resources, develop a methodology to measure the cost of a company's or national economic impact on the environment. Soil pollution, Ground, and Surface water contamination, air emissions, and Sound pollution are various liabilities related to the environment, industries should clean out liabilities by maintaining an accrual accounting system: In this connection, firms should follow regulatory and legal requirements, maintain acquisition and divestiture proceedings. Accounting and its professionals have huge contributions to control environmental confront (KPMG, 1993).

The implementation of a complete EA system is a very difficult, highly technical and expensive job. But the scope and completeness of EA depend on the decision of the organization (Deegan, 2002). The exact definitions, scope, and applications of EA vary, using a mix of financial and non-financial terms, and can be prepared for internal and/or external use. EA captures information at three levels (industry, local, and regional) and implements its analysis of economic and environmental information in three different stages. i) Global Environmental Accounting (GEA), ii) National Environmental Accounting (NEA) and, iii) Corporate Environmental Accounting (CEA). GEA deals with the resource accounting of energy, ecology, and economics at overall world level, NEA deals with an accounting approach of environmental and ecological impacts on a country's level, and CEA works at the organizational level that covers the assessment, analysis, and presenting the corporate economic activity that has an impact on environmental degradation for the concerned internal and external groups.

Water and energy accounts got top priorities as the compilation of new modules for EA at the whole worldwide. But recently agriculture; forestry, fisheries, waste management, air emissions, and land also achieved focus as new accounts of EA in developing countries. However, developed country's most commonly cited and focused new accounts are environmental taxes and subsidies accounts. They also quote for resource management expenditures, environmental goods and services sector, and environmental protection expenditure accounts.

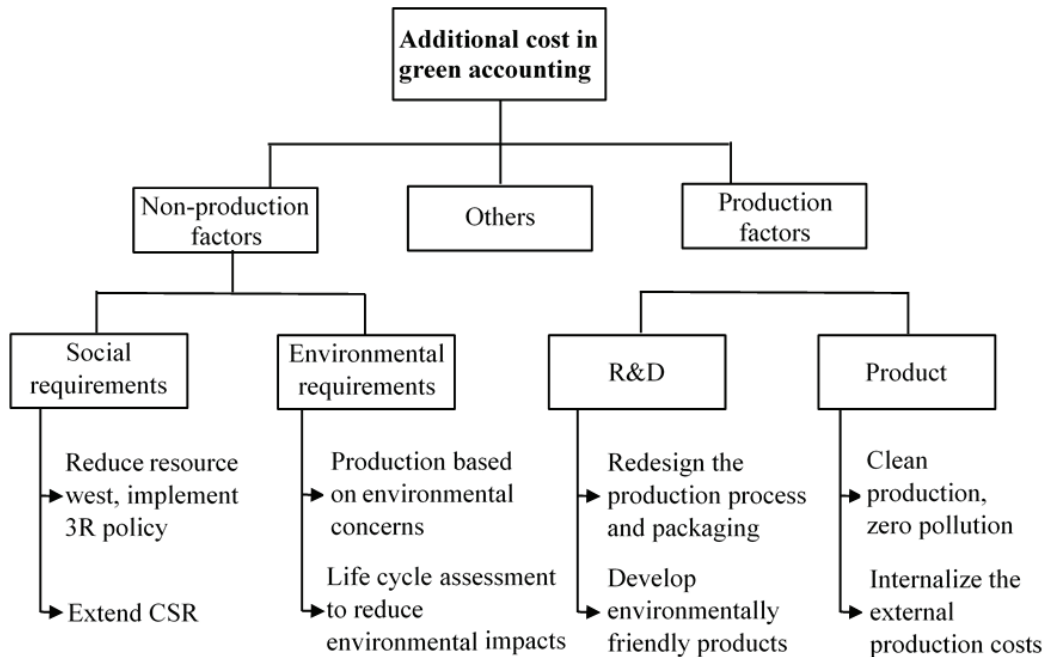
Based on some basic structures Schaltegger & Burritt et al., (2000) divided EA into three categories such as external environmental accounting, environmental management accounting, and other environmental accounting. External environmental accounting generates information in annual reports using GAAP for outside users. Other environmental accounting assesses the cost for environmental degradation by management and is used to calculate for

environmental tax and subsidy accounting or regulatory EA. To facilitate the establishment of EA, organizations should expand their corporate social responsibility; production takes all necessary environmental protection and reduce pollution; all kinds of pollution organizations improve the total production process; recycle and reuse of wasted resource; develop research and development and finally try to internalize the external production cost. Bangladesh needs to initiate, develop and implement a series of stages to construct a complete and standard EA system.

Environmental cost

Environmental Management Accounting (EMA) is termed as the management of the environment and economic activity by the International Federation of Accountants (2014), deals with the improvement and execution of suitable environment accounting systems practices, and it receives unique recognition recently (Jasch, 2018). The complicated issues in EA are the identification of Environmental Costs (EC). EMA takes decisions regarding capital investments of the company, finds out the appropriate cost of the project/ process; design of the products, evaluations the performance, and many other managerial issues. Traditionally production-related waste clean-out costs or recycling the wastewater costs, and other damage treatment costs related to the environment are considered as the EC. But accounting for these costs is a temporary solution, so organizations should always consider the costs of consumption of natural resources.

Economic activities by different manufacturing and other industries deteriorate natural assets and create issues of different costs are termed as ECs in EA. These costs are ecological contribution costs, waste management costs, costs of environmental subsidy, taxes and penalties, purchase of pollution management technologies, and the cost of damaging natural assets. The most critical thing in EA is to calculate the economic activity on the environment and traditional accounting and finance principles are followed to identify and analyze the EC. Monetary and non-monetary data (product and non-product) needs to work out the complete EC and thus both an internal and external perspective would be determined on the organizational scale. Packaging materials, reward auxiliary materials, operating materials, water, energy, and environmental information of productive and non-productive outputs are termed as non-monetary data. Whereas product and non-product outputs like research and development costs, prevention and other ecological management costs, waste and carbon emission reduction costs, less tangible costs, other CSR and environmental-related costs are considered as monetary data (Sumiani, Haslinda, & Lehman, 2007). The following flowchart depicts an overall idea of additional cost in EA.



*Figure 1: Cost factors in Environmental Accounting by Kawakita Jiro Method
(Modified by Author)*

To ensure sustainable development each organization need to measure its environmental consequences before starting its environment-related activity and develop a strong management system to assess EC accurately, EC decision is very much integrated into broader management decision in any organization and serves the organization's corporate social responsibility or sustainability function as well as the country. Kawakita Jiro (KJ) method and the meta-research method have been prepared based on the guidelines of EA and used to analyze the influence factors of EC. In the KJ method 86 additional cost attributes were regarded as 86 units or cards and the concepts of production and non-production factors were mainly divided into two groups. In the production group, the major factors were divided into product and R & D, whereas in the non-production group, the division occurs based on the environmental requirements and social requirements.

Development History of Environmental Accounting

The continuous development of industrialization increases the adverse effect of climate change and many unavoidable disasters also; with these consequences, EA emerged to control the dreadful conditions of the environment in the year early 1970. The development of EA can be categorized into four stages. According to Vasile & Man (2012), the first stage (1970 – 1980) had a more descriptive character and was the inauguration of the research of EA. In the second

stage (1981- 1994), EA got much attention as a new area of research, the managers and even accountants started to show more research interest to account environment-related economic activity and EA and accounting role also high lightened regarding the disclosure of information about environmental activities (Vasile & Man, 2012). In the third stage (1995- 2001), EA developed both theoretically and practically especially in developed countries, and reached a maturity stage (Vasile & Man, 2012). From this time, environment related information was starting to be taken into consideration, and also, environmental audit or verification has been started. This period was being named the “keystone” of EA and research has been started to develop EA by the accounting researcher and give more emphasis on the approach of environmental reporting, try to develop a standard format for reporting, and a new arena of environmental management accounting rise to ensure the quality of environment-related accounting information (Vasile & Man, 2012). Finally, from 2002 to date, EA research worked as a new section of accounting and to develop ER practice framework, audit, and management accounting.

The Framework of Environmental Reporting for different countries

Norway prepared environmental accounts as the first European country, in the year 1970. Then to measure the use of the natural resource (forests, fisheries, energy, and the land) they established air pollutant emissions accounts (1980), which were very closely tied to the energy accounts (Meadows et al. 1972). The second and third early adopters and front runners of EA were Netherlands and France. In the Netherlands, NAMEA (National Accounting Matrix, together with Environmental Accounts) the economic sector controls various waste releases and also evaluates the execution of environmental fortification purposes. Whereas, France commenced developing a method termed as *Compètes du Patrimoine*, or patrimony accounts in the year 1980. Indonesia also started a study that had considerable encouragement on EA undertaken by the World Resources Institute, but later on, this study was extensively opposed on technical grounds and finally banned by the government decision of Indonesia.

In the late 1980s, US Environmental Protection Agency (EPA) resumed the progress to set of pilot accounts combining the full value of non-marketed goods and services, to smoothen the net change of economic activity for the Chesapeake Bay region of the eastern United States (Grambsch et al. 1989), led by an economist, Henry Peskin. He also conveyed this approach to USAID-funded work in the Philippines. Treating the environment as a dynamic sector in the economy of Philippines, the Environmental and Natural Resource Accounting Project (ENRAP) has been started its function on environmental accounts in 1993.

Namibia has been followed the SEEA approach (The System of Environmental-Economic Accounting), which is a structure that combines economic and environmental data, and concentrates on numerous key natural resources areas. Again the Central Bank watch out for the progress of environmental accounts in Chile and also concentrated the country's forest and

mineral-based progress strategy and hence suggests the change in the strategy for sustainable expansion.

Ministry of Environment of Japan had issued “Environmental Accounting Guidelines-2002”, for disclosing EA information uniformly to the public society. They put maximum attention regarding the preservation cost of the environment; analyze the profit of a safe environment, and other facilities of environmental preservation activities.

The global environment is losing its safety day today as EA has not been adopted widely in all countries. Although accounting costs for the past, present and future environmental activities have become increasingly vital nowadays, no standard framework has not yet been developed for the practices of EA. Guidelines that are used in recent years in many countries are Denmark (Green Accounts Act [2], 1995), the Netherland (Environmental Management Act [2]), the US (Environmental Protection Agency, 1995), Japan (Ministry of the environment 2005), Taiwan (Environment Protection administration, 2008). But according to Deegan (2002), the enthusiasm to expand and improve an accounting system of the environment as well as financial performance for an organization is similar for all countries.

Sustainable Development

Economic development issues cannot be set apart from environmental issues. Excessive consumption and misuse of lands, waters, forests, and other natural resources create a massive adverse effect on the environment. “Accounts of Sustainability” idea has been drawn special attention as a global thought during the period of 1990s (Gray, 2010). “Sustainability” refers to “social responsibility” or “environmental management” and most importantly it ensures the current developments and doesn’t create any hazards to the upcoming generations, maintain the appropriate corporate attitudes and ensure justice with natural resources, develop social integrity and promote rational human activity and equal opportunity (Thornton, 2013). Thus sustainability is both an ecological and societal concept that engaged morally with the use of nature by humans and its impact on a social and natural environment. Again according to Solomon & Thomson (2009) any projected sustainable condition will be the combination of the relationship between entities, individuals, societies, and states.

The sustainable development (SD) principle always creates concern for the entity to think about the welfare of society without harming the environment. Thus SD can ensure the needs of existing and future communities, social integrity and inclusion, promoting personal purity, and ensuring equal opportunity. Implementation of Legitimacy theory makes the organizations legitimate to the society and bound them to follow the norms, beliefs, and values within the society. Again, compulsory Environmental Reporting (ER) by concerned stakeholders can ensure SD and could prevent different pollution by developing a good environmental management system. ER is the best tool to communicate with the compulsory environmental disclosure and to ensure SD.

To ensure SD all over the world by 2030 the United Nations (2015) set seventeen interlinked goals. Bangladesh already has attained remarkable improvement in poverty reduction, gender equity, distribution of electricity, GDP growth, and sanitation issues and moving forward for achieving SDGs. To complete SD in a comprehensive manner it is necessary to increase focus on 7 environment-related goals of SDGs, i.e, **goal 3:** Good Health and Well-being; **goal 6:** Clean Water and Sanitation; **goal 11:** Sustainable Cities and Communities, **goal 12:** Responsible consumption and production; **goal 13:** Climate Action; **goal 14:** Life Below Water; and **goal 15:** Life on land. These seven goals are connected to the protection of the ecosystem and environmental protection.

Due to rapid industrialization, urbanization, lack of awareness, and other economic development, the existence of all species and our planet also fall at high risk. If the environment continues the current level of carbon emission then the climate refuge will be beyond imagination and climate change will be a serious threat to Bangladesh in achieving the SDGs. So it is high time to give more attention to lessen the soil, water, air, and sound pollution and develop a proper waste management system, find out environment-friendly energy source, control deforestation and increase tree plantation, and take all other environmental protective measures. Mandatory ER practices by organizations in the annual report can control the risk of the environment and hence can move forward to achieve SDGs and mitigate the existing risk.

The Environmental Law in Bangladesh

In Bangladesh, various constitutional provisions have been developed to safeguard the use of natural resources of the environment. Our constitution keeps the provision that "The state shall take all responsibility to protect and preserve the natural resources, water, lands, forests, and wild life for the present and future citizens to ensure the improvement of environment" (Article 18A). "The Environment Conservation Act of 1995" is the most important regulation to save the environment. The core objective of this legislation is to conserve the country's environment, improve its standards, and take steps to reduce different environmental pollution'. Later on "The Bangladesh Environment Conservation (Amendment) Act, 2010" modified this endorsement. The constitution states (Act 1995) almost all aspects of the environmental issues to make certain sustainable development. The other vital laws associated with the protection of the environment are, "The Environment Conservation Rules 1997, The Forest Act 1927, The Bangladesh Water Act 2013, The Protection and Conservation of Fish Act 1950, The Brick Manufacturing and Brick Kilns Establishment (Control) Act 2013, The Environment Court Act 2010, etc.

The Environment Conservation Rules 1997 offer extra guidance for particular components of the Act. This rule enlarges the system for issuing an Environmental Clearance Certificate, classifying industrial units, maintaining the environmental standards for air, water, sound, odor, gaseous emissions, and other components of the environment and thus preserving the

security of the environment. “The Forest Act 1927” incorporates the law regarding forests and will look after about production of the forest, the duty on logs, and all other forest production.” The Bangladesh Water Act 2013” confirms the overall improvement, administration, supply, exploitation, and preservation of water resources in Bangladesh.

“The Protection and Conservation of Fish Act 1950” delivered the requirements to develop, and conserve the fisheries sector of Bangladesh. By this law, the Government may control the catching period, transportation, revealing, or control for sale or trade of fishes throughout Bangladesh. “The Brick Manufacturing and Brick Kilns Establishment (Control) Act 2013” keeps an eye to control all related purposes relating to brick production and brick kiln establishment considering the issues of storing up the environment and sustainability. “The Environment Court Act 2010” established courts for environmental pollution-related offenses.

Besides these national laws, there are some national policies and strategies in Bangladesh to protect the environment. These national policies are Forest Policy 1994, Energy Policy 1995, Fisheries Policy 1998, Policy for Safe Water Supply and Sanitation 1998, Agriculture Policy 1999, Environment Management Action Plan (NEMAP) 1995, etc. This is very important now to include national and international guidelines to make a perfect plan to implement the environmental laws, policies, and strategies in harmony with the goal of SD.

Review of Literature

A broad level of study on environmental issues and environmental disclosure practices has been started after 1970s. Bartelmus (1992) developed the relationship between sustainability and accountability regarding ecological issues, cost; also pointed out national-level green accounting. In a study, Ho et al., (1994) found that only 9 out of 182 Hong Kong companies disclosed their environmental-related information in annual reports. Again, studying Korean companies’ annual reports in the year 1997 Choi (1998) found that only 64 out of 770 companies revealed environmental disclosures in their financial statements. Silver and Savage (1994) analyzed 115 companies in Africa and observed that only 63% of companies unveil environment-related accounts in their annual reports.

Later on, El Serafy (1997) had done important research identifying the environmental changes around the world and claimed that environmental accounting has little influence on national income and ecological sustainability. In his research regarding environmental disclosures in the annual reports, Neu et al., (1998) found a relation between EAR and firm performance on Canadian public companies (1982-1991) operating in the mineral extraction, forestry, oil, gas, and chemical. Fussel & Georg (2000) disputed that management accounting is the source of environmental management accounting and from financial accounting, the theory of environmental accounting was exposed.

Bartelmus. P. (2014) had researched the revised SEEA (2003) and found the preference for physical accounting and the corresponding loss of systemic coherence (as compared to the SEEA-1993) prevents meeting the proclaimed objective of assessing sustainable development. Gray and Babington (2010) had depicted the contemporary scenario of environmental accounting research and prioritized environmental reporting and emphasize the practice of green accounting for sustainable development.

Gray (2013) revealed that green accounting could deal with accounting with nature and sustainability rather than financial accounting on an economic ground linked with nature. Edens & Hein (2013) pointed out the reintegration and appreciation of the ecosystem, the details of ecosystem facilities, controlling degradation, and allocation to the established sectors.

Bebbington & Larrinaga (2014) expressed frustrations in their paper due to the deficit of social and environmental accounting towards addressing sustainable development and then introduces how sustainability science approach to accounting could be Environmental. Stasiskiene, Z. (2014) defined in his research that EAR is an organized and proper approach to addressing environmental impacts and integrating environmental issues into business processes and also told that the environmental information is not only useful for external stakeholders but also for internal users.

Tu and Huang (2015) conducted a study to analyze the relationship between green accounting and Green design. The study adopted the KJ method and the meta-research method the results decided that green accounting includes some factors. Green accounting should include corporate social responsibility, should not exempt production from environmental protection, the pollution produced in production should be reduced and cleaned, the external production cost should be internalized, the product will be environmentally friendly and the implementation of (Reduce, Recycle, Reuse) 3R policy should get priority. Deegan (2016) reflects on 25 years of social and environmental accounting (SEA) research and observed that Critical Perspectives of Accounting (CPA) had been a major vehicle for disseminating SEA research with the published research coming from a variety of 'critical', 'middle-of-the-road', and 'managerial' perspectives.

Rahman (1998) tried to figure out the practices of environmental accounting in Bangladesh. The study concentrated on two main methods - GSA and SEEA - to identify the environmentally adjusted national income which in some literature is coined as Eco Domestic Product (EDP). Rahman & Mutakin, (2005) studied Corporate Environmental Reporting Practices in Bangladesh of Selected Companies and observed very poor practices in Bangladeshi companies. Bose (2006) mentioned that to make an ecologically friendly environment in Bangladesh, Petrobangla took various initiatives to minimize environmental loss and ensure sustainability.

Mahmud et al. (2013) depicted that green accounting is related to environmental information and the environmental eco-system. The research reflected that green accounting focuses on corporate social responsibility, environmental cost, and reporting, corporate governance side by side the natural resources, and environmentally sound management and administrative system in any country around the world. The study revealed that the practice of green accounting is satisfactory only in developing countries. Green expenditures are not calculated in the middle-income country and least developed countries and no step is taken to introduce green GDP (Gross Domestic Product), EDP (Eco-Domestic Product), besides the traditional GDP.

Khalid et al. (2012) argued that Bangladeshi companies are not interested to report environmental disclosures, identifying appropriate environmental costs, and being prepared merely to legitimate with society, buyers, regulatory bodies, and the stakeholders. In another study using both primary and secondary data Ahmed (2012) found that executives and authorities were not much concerned about green accounting and environmental disclosure and thus the annual reports had found a poor disclosure regarding environmental information (Ahmed, 2012).

Asdrubali et al. (2013) discussed in their paper regarding the emission of greenhouse gasses and maintaining ecological balance and suggests authorities should have taken proper legal action against responsible companies to ensure sustainable development and maintaining ecological balance. Hossain et al., (2016) did descriptive research to explore the development and relation of Environmental accounting and sustainable development. Masud et al., (2017) also tried to find out the Environmental Accounting and Reporting Practices of Listed Banking Companies in Bangladesh and propose a separate conceptual framework for EAR.

Ahmed & Hossain (2015) conducted an analysis of the climate change and global warming discourses and disclosures in the annual reports of the companies of Malaysia. They examined 79 companies to identify the issues on global warming and concluded that the company disclosed very issues as the climate change disclosure is not mandatory for Malaysian companies.

Hussain et al., (2016) did research on green banking issues by the banking companies in Bangladesh. Through content analysis of the annual reports of ten sample banks, the research found that Bangladeshi banks are reporting on green banking issues in a small amount, even in the absence of any specific reporting guideline.

A magnitude of research had been done in Bangladesh related to Environment reporting and Sustainability development. This study first time presented all the pertinent concepts and history related to environment and sustainability development. The discussion highlighted the details on Environment accounting, Environmental cost, Environmental history, Environmental framework for different countries, and Environmental law in Bangladesh. The research also tried to establish the relationship between Environmental reporting and sustainability development. At the end section of the study, the authors tried to reflect the practice scenario of environment

related disclosure in Bangladesh. To do this the study collected data from the annual report on 99 listed “A category” companies in 8 manufacturing sectors of the Dhaka Stock Exchange, and, figured out the actual scenario of environment related disclosure, Corporate social responsibility disclosure, and sustainability types of disclosure in the manufacturing sector of Bangladesh.

Environmental Reporting Practices in Bangladesh

In the previous section, this paper has tried to prove that without appropriate reporting of environmental degradation, sustainable development would become an unsuccessful endeavor. The unparalleled role of environmental reporting can be accomplished by the appropriate implementation of Stakeholder and legitimacy theory. To fulfill the demand of powerful stakeholders, environmental reporting is a great attempt, which can minimize all kinds of pollution in an organization, would develop a perfect environmental management system, ensure proficient utilization of natural resources, etc. Proper practice of ER can ensure the Legitimacy theory, by creating the norms, beliefs, and values within the society. The focal point of this section is to portray the actual picture of ER practices in Bangladesh to ensure sustainable development.

Methodology of the study

The purpose of this study is to link Environmental reporting and sustainability development. Research also examined the practice reflection of the listed manufacturing industries in Bangladesh. The secondary data have been used only to expose the environmental disclosure practice. The secondary information of this paper has been collected from secondary sources, i.e; research papers, books, articles, news portals, journals, and annual reports of mentioned companies. Most of the annual reports were collected from the company’s websites, Lanka Bangla Finance portal, and Dhaka Stock Exchange (DSE). Judgment sampling method has been used to selected the required sample size, which collected samples from 99 “A” category companies and from 8 different manufacturing sub sectors of DSE, which are textile, pharmaceuticals and chemicals, food and allied, cement, tannery, fuel and power, Jute, paper and printing. The study has been chosen this sector purposively, as these sectors are highly accountable to produce a large level of environmental hazards. The research considered that DSE listed “A” category companies are financially secured and hence expected to cover a wide range of reporting. Applying content analysis in the year 2019 this study has collected environment, corporate social, and sustainability related disclosure information for the 99 manufacturing companies.

The rationale for selecting “A-category” manufacturing companies

In Bangladesh, there are more than two thousand small and large manufacturing industries across the country. These manufacturing industries are producing huge waste every year and are largely responsible for the air, water, land, and sound pollution. This study tried to cross-check eight different manufacturing sectors (Textile, Tannery, Pharmaceuticals, Fuel & Power, Jute,

Paper & Printing, Food & Allied, Cement), whether these manufacturing companies disclosed any recycling information, or they have any reduce and reuse system. This research checked the ER practices of the “A-category” listed manufacturing industry of DSE, considering that “A-category” companies are financially well categorized in DSE.

Table 1: Number of Selected listed “A category Companies” from DSE

Observed Manufacturing Sector	No of observed company
Textile	33
Pharmaceutical & Chemicals	26
Fuel & Power	18
Food & Allied	9
Cement	6
Tannery	4
Jute	2
Paper and Printing	1
Total	99

Practices of Environmental Reporting of different Manufacturing Companies

Textile Sector: Textile sector is the leading manufacturing industry and plays a massive role in holding the country's rising economy. Among a total of 56 DSE listed companies 33 listed “A category” companies of DSE had been taken as a sample. The following Table 2 gathered different types of Environment related, Corporate Social, and Sustainability related disclosure information of Textile companies.

Table 2: Different Types of Disclosure Information of Textile Companies

Types of Disclosure (Textile)	Disclosed Information	Sources (Specific section of annual report)	%of Expenses= Amount of expense/ Total expense*100	Information Type
Environment Related Disclosure (ERD) (8 Companies)	<ul style="list-style-type: none"> • Effluent treatment plant(ETP), • Water treatment plant (WTP) • Environmental, Social and Government (ESG) • Sustainable Production • Reduce Natural Resources consumption 	<ul style="list-style-type: none"> • CSR and sustainable Report • Directors Report • Mission and objectives Section • Financial Statement • ACI policy statement 	1.31 (Paramount textile limited only)	Qualitative & Quantitative

Corporate Social responsibility related disclosure (CSR) (9 Companies)	<ul style="list-style-type: none"> • Tree plantation • Awareness program regarding sustainability • Environmental protection and welfare • Fostering Art & Culture • Donations and others but no EAR 	<ul style="list-style-type: none"> • CSR Report • Directors Report • Environmental report 	No	Qualitative
Sustainability Related disclosure (SRD) (8 Companies)	<ul style="list-style-type: none"> • Sustainable development and certification • Reduced GHG Emission • Recycling Production • Chemical Management, Carbon Emission, ETP • Reduced use of chemicals • Less carbon emission and water Plant • Environmental related initiatives • Waste and Water management 	<ul style="list-style-type: none"> • Directors Reports • Sustainability Report 	No	Qualitative

It is observed that environment-related initiatives are not satisfactory and most of the companies don't have quantitative environmental disclosure on the financial statement. Only (Paramount Textile Limited) a company has Effluent Treatment Plant (ETP), Water Treatment Plant (WTP) and under factory overhead, they have also a separate entity naming ETP and WTP. **The company declared its** partly maintenance expense in separate disclosure on environmental management under property, plant, and equipment and spend only 1.31% of total expenditure.

Pharmaceuticals and Chemical Sector: The second-largest manufacturing industries are Pharmaceuticals and chemical industries and also produce a huge amount of environmental pollution. The 26 (out of 31) listed "A category" pharmaceutical companies of DSE were taken for analyzing ER performances and observed very few companies are slightly exposed information in their director's reports, CSR, and in the chairman's reports also (Table-3). The maximum disclosed information is qualitative. Marico Bangladesh Limited has a separate sustainability reporting section to attain for various eco-friendly projects for SD. Wata Chemicals Limited has a separate section for EAR disclosure and the "Tree Plantation" project. Some of the well-known pharmaceuticals companies (Beximco, GSK, IBN SINA, Orion, Square Pharma) contribute to CSR and sustainability activity and they had a commitment regarding EAR reporting in their financial statement. GSK Bangladesh had a 20% profit redistribution

project among community workers as CSR activity but they had no mentionable contribution towards the environment about sustainability.

Fuel and Power Industry: Another crucial manufacturing sector in Bangladesh is the fuel & Power Industry which produces a large number of environmental pollution, but this research observed that maximum companies of this sector don't practice EAR. Table -4 gathered the observed information of 18 companies and revealed that Summit Power exposed their environmental consultancy/compliance expenses in their financial statement. In the financial statement of summit power, the company exposed that they spend 6.24% of the total expenses. On the other hand, United Power Generation & Distribution Limited and Doreen Power Generations and Systems Limited revealed their environment-related expenses in the financial statement but under admin and market expenditure. Table 3 also shows that most of the companies exposed qualitative information and have reported CSR, and sustainability information on the directors' report, the chairman's report, and sustainability reporting.

Table 3: Different Types of Disclosed Information by Pharmaceuticals Companies

Types of Disclosure (Pharmaceuticals and Chemical)	Disclosed Information	Sources (Specific section of annual report)	% of Expenses= Amount of expense/ Total expense*100	Information Type
Environment Related Disclosure (ERD) (8 Companies)	<ul style="list-style-type: none"> • Waste management and • Upgrading technology • Effluent treatment plant(ETP) • Water treatment plant (WTP) • Recycling, renewable energy • Controlling air pollution, paperless office • Environmental friendly technologies 	<ul style="list-style-type: none"> • ACI policy statement • Directors Report • EHS Report • Ssustainability Report • Financial Statement (under admin and Market Expenditure) 	No	Qualitative
Corporate Social responsibility related disclosure (CSR) (6 Companies)	<ul style="list-style-type: none"> • Tree plantation & encouraging Sustainability • 20% profit reinvestment to community workers but no amount for environment • Community development program but no EAR concern • Donations and others • Environmental safety, • paperless office, natural light 	<ul style="list-style-type: none"> • CSR Report • Directors Report • Environmental report 	No	Qualitative
Sustainability Related disclosure (SRD) (5 Companies)	<ul style="list-style-type: none"> • Environmental protection • Environmental sustainability and management • Reduced waste and water management • Reduce power consumption • Reduce carbon emission 	<ul style="list-style-type: none"> • Director Report • Sustainability Report 	No	Qualitative

Table 4: Different Types of Disclosed Information by Fuel & Power Companies

Types of Disclosure (Fuel and Power)	Disclosed Information	Sources (Specific section of annual report)	% of Expenses= Amount of expense/ Total expense*100	Information Type
Environment Related Disclosure (ERD) (3 Companies)	<ul style="list-style-type: none"> • Environmental compliance cost • Environmental Compliance and ISO certification • Environmental expenditure 	<ul style="list-style-type: none"> • Financial Statement • Financial Statement (Under general and admin cost) 	6.25% (Doreen Power Generation & Systems)	Qualitative & Quantitative
Corporate Social responsibility related disclosure (CSR/D) (8 Companies)	<ul style="list-style-type: none"> • CSR but not EAR related Power plant management • Donations and others but no EAR • Environmental donations and others 	<ul style="list-style-type: none"> • CSR Report • Directors Report 	No	Qualitative
Sustainability Related disclosure (SRD) (4 Companies)	<ul style="list-style-type: none"> • Maintaining SDGs • Climate change and carbon emission, water management • Minimum level Carbon Emission • Minimum Carbon Emission 	<ul style="list-style-type: none"> • CSR • Sustainability Report • Directors Report 	No	Qualitative

Tannery Industry: This industry is the 2nd largest manufactured exporting industry in Bangladesh and is highly accountable for the environmental degradation of Bangladesh. Table 5 gathered the collected data and depicts only Apexfootware disclosed qualitative information in their director's report, CSR report, and Sustainability report only.

Table 5: Different Types of Disclosed Information by Tannery Companies

Types of Disclosure (Tannery)	Disclosed Information	Sources (Specific section of annual report)	% of Expenses= Amount of expense/ Total expense*100	Information Type
Environment Related Disclosure (ERD) (8 Companies)	<ul style="list-style-type: none"> ETP (since 1996), Water dosing system in the tannery 	<ul style="list-style-type: none"> Sustainability section 	No	Qualitative
Corporate Social responsibility related disclosure (CSR) (9 Companies)	<ul style="list-style-type: none"> Donations and others but no EAR 	<ul style="list-style-type: none"> CSR Report Directors Report 	No	Qualitative

Food and Allied Sector: In this sector out of 9 listed “A category” companies, **only 3 (33%)** companies (BATBC, GHAIL & Olympic) provided environment-related information, such as carbon emission, waste cycling, and tree plantation project. Other companies in this sector had not provided any types of qualitative or quantitative information in their annual report. BATBC spent only exposed their total amount of environment related expenditure (1.10%) in their financial statement.

Table 6: Different Types of Disclosed Information by (Food & Allied) Companies

Types of Disclosure (Food and Allied)	Disclosed Information	Sources (Specific section of annual report)	% of Expenses= Amount of expense/ Total expense*100	Information Type
Environment Related Disclosure (ERD) (1 Companies)	<ul style="list-style-type: none"> Social Responsibility 	<ul style="list-style-type: none"> Financial Statement 	1.10% (British American Tobacco Bangladesh Company)	Quantitative
Corporate Social responsibility related disclosure (CSR) (3 Companies)	<ul style="list-style-type: none"> Bonayan Project CSR but not EAR related Environmental protection and others Water and sanitation, community program 	<ul style="list-style-type: none"> CSR Report Directors Report (British American Tobacco Bangladesh Company: Distribute 105 million saplings since the 1980s)	No	Qualitative

Sustainability Related disclosure (SRD) (3 Companies)	<ul style="list-style-type: none"> Reducing CO2 emission by using renewable energy WTP and less carbon emission ETP, Reduce waste generation and ensuring renewable energy 	<ul style="list-style-type: none"> Sustainability Report 	No	Qualitative (British American Tobacco Bangladesh Company: 30% of total use from renewable sources)
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Cement Sector: Among 7 cement companies (Table 7) only 1 (14%) (Heidelberg Cement Bangladesh Ltd) discloses Environmental expenses in their financial statement. Premier Cement Mill discloses some sustainability and environment-related qualitative information only. But other companies disclosed some qualitative environment-related information only in their vision, mission, CSR, and sustainability reports but no separate EAR disclosure in the financial statement.

Table 7 : Different Types of Disclosed Information by (Cement) Companies

Types of Disclosure (Cement)	Disclosed Information	Sources (Specific section of annual report)	%of Expenses= Amount of expense/ Total expense*100	Information Type
Environment Related Disclosure (ERD) (3 Companies)	<ul style="list-style-type: none"> Environmental expenditure Waste management and Geo Cycle project Environmental protection 	<ul style="list-style-type: none"> Notes to the financial statement 	No	Qualitative
Corporate Social responsibility related disclosure (CSR) (4 Companies)	<ul style="list-style-type: none"> Community development program but no environmental issue Donations and others but no EAR community development program but no environmental issue Tree plantation and awareness program 	<ul style="list-style-type: none"> CSR Report Directors Report 	No	Qualitative
Sustainability related disclosure (SRD) (2 Companies)	<ul style="list-style-type: none"> Geo-cycle (Efficient Waste Management) Waste management and carbon footprint 	<ul style="list-style-type: none"> Directors Report Sustainability report 	No	Qualitative

Jute, Paper & Printing Industries: Jute industry does not expose any types of environment-related information. Only Bashudhara Paper Mills Limited discloses CSR-related qualitative information in the director's report (Table-8).

Table 8: Different Types of Disclosed Information by Jute & Printing Companies

Types of Disclosure (Fuel and Power)	Disclosed Information	Sources (Specific section of annual report)	% of Expenses= Amount of expense/ Total expense*100	Information Type
Environment Related Disclosure (ERD) (1 Company)	<ul style="list-style-type: none"> • Environmental protection 	<ul style="list-style-type: none"> • Directors Report 	No	Qualitative
Corporate Social responsibility related disclosure (CSRRD) (1 Company)	<ul style="list-style-type: none"> • CSR but no EAR 	<ul style="list-style-type: none"> • Directors Report 	No	Qualitative

The study observed that the companies disclosed their environment or CSR-related information under different patterns; such as cost of sales, administrative expenses, accrued expenses, different places of notes to the financial statements, directors/ chairman's speech, mission, and vision, etc. Companies disclose their ecological expenditure information under different titles, such as "Environmental compliance cost, tree plantation, environmental expenditure, environmental maintenance cost, and environmental stewardship" etc. Many companies also expose lots of commitments in their annual reports to protect the environment. The study observed a lack of a standard framework for all companies to disclose their environmental issues.

Conclusion

Manufacturing industries produce a huge amount of industrial and toxic wastage each year and are acting as a substantial threat in achieving sustainable development goals. It is acknowledged that some goals in SDGs are directly and indirectly related to environmental sustainability and may be sorted out by the proper implementation of the ER. This study for the first time tried to gather all the necessary literature related to environment and sustainability development. To this extent, the paper discussed precisely environment accounting, environmental cost, environmental history, environmental framework for different countries, and Environmental law in Bangladesh. The research tried to portray the link between Environmental reporting and sustainability development, and focused to identify the specific disclosure of the ER in different manufacturing sectors with their sources. With this point of view, applying purposive sampling, the study first time collected data from 99 listed "A Category" companies in DSE from 8 different manufacturing sectors in Bangladesh, considering that "A Category" companies are financially acknowledged and are expected to maintain a high level of environmental disclosure. The study captured the specific disclosure regarding the environment, Corporate social, and sustainability types for 8 different manufacturing sub sectors separately. The research found

that the financially sound companies also disclosed very little information in their financial statement, rather most of the revealed information is qualitative in nature and some of them were committed in the Mission statement and directors' report only. The study observed that only paramount textile (1.31%), Doreen power generation & Systems (6.24%), and British American Tobacco Bangladesh (1.10%) exposed their total amount of disbursement regarding environmental issues in their financial statement. Rahman (1998), Rahman & Muttakin (2005), Bose (2006), Khalid et al., (2012), Ahmed (2012), and Ahmed and Hossain (2015) also identified the significance of green accounting and observed poor environmental practices in Bangladeshi companies. Research identifies that voluntary environmental reporting regulation might be one of the key issues. Hence, taking into account the disclosure scenario of "A category" companies the study recommends enforcing a standard enforced framework to facilitate environmental reporting to attain sustainable development goals.

Implications of the Study

The study observed a lack of standard and voluntary framework in financially sound companies to disclose the environment, Social and corporate social information. Thus recommends that the concerned authorities and the national-level accounting bodies should develop a specific conceptual framework on environmental reporting practices in Bangladesh mentioning specific objectives, qualitative characteristics, and general assumptions for the corporate sector. Research also suggests that to account for the environmental disclosure, the organization should develop their policies, improve the knowledge of management, and arrange training to develop skills at the personal level as well as management level, to assess capital, operating, and other environmental expenditure properly. Capital expenditure can include expenditure on effluent treatment, tree plantation, waste management plant, etc, and operating expenditure can include the machinery maintenance cost, environmental awareness cost, and other periodicals environmental cost, etc. Research also suggests imposing penalties and subsidies to the companies in contrast to producing environmental hazards made. A high level of industrial awareness and ethical standards about environmental reporting and sustainable development of individuals and companies is also required to shorten the path of sustainable development.

Finally, the study believes that accumulating all environment and sustainability related concept, specific environment, Social and corporate social disclosure information with their sources will give valuable inputs to the concerned policy makers to resolve the eminent problem of environmental reporting and also the academicians to conduct further research on this area.

Limitation and Future Scope

The study did the content analysis in a specific year and analyzed the secondary data by descriptive statistics only. Using the judgment sampling method the study has collected data on 99 "A category" companies in different manufacturing sub sectors of listed DSE, considering that "A category" companies are well established and will be superior in the context of Environment

reporting. Further research on this field may be undertaken on considering overall DSE listed companies or on a particular sector to discover the whole situation. Using time series data and applying advanced econometric tools to measures the relation between the performance of the companies and the companies who disclosed environment related information might be the advanced extent of the research to find more effective and significant results.

References

- Ahmed, A. (2012). Environmental Accounting & Reporting Practices: Significance and Issues: A Case from Bangladeshi Companies. *Global Journal of Management And Business Research*, 12(14): 119:127
- Ahmad, N. N. & Hossain, D. M. (2015). Climate Change and Global Warming Discourses and Disclosures in the Corporate Annual Reports: A Study on the Malaysian Companies. Global Conference on Business & Social Science. Kuala Lumpur: Elsevier Ltd. <https://doi.org/10.1016/j.sbspro.2015.01.361>
- Asdrubali, F., Presciutti, A. & Scrucca, F. (2013). Development of a greenhouse gas accounting GIS-based tool to support local policy making—application to an Italian municipality. *Energy Policy*, 61(0): 587-594
- Bebbington, J. and Larrinaga, C. (2014). Accounting and sustainable development: An exploration. *Accounting, Organizations and Society*, 39(6): 395-413
- Bose, S. (2006). Environmental Accounting and Reporting in Fossil Fuel Sector: A study on Bangladesh Oil, Gas and Mineral Corporation (Petrobangla). *The Cost & Management*, 34(2): 53-67
- Burrit, R., Evans, E. and Guthrie J (2012). *Emerging pathways for the next generation of accountants*. The Institute of Chartered Accountants in Australia.
- Bartelmus, P. (1992). Accounting for sustainable growth and development. *Structural Change and Economic Dynamics*, 3(2), 241-260
- Bartelmus, P. (2014). Environmental–Economic Accounting: Progress and Digression in the SEEA Revisions. *The Review of Income and Wealth*, 60(4):887-904
- Choi, J. S. (1998). An evaluation of the voluntary corporate environmental disclosures a Korean Evidence. *Social and Environmental Accounting*, 18(1): 2-7
- CICA (1993). *Environmental Costs and Liabilities: Accounting and Financial Reporting Issues*, Toronto.
- Deegan, C. (2002). The legitimizing effect of social and environmental disclosures- a theoretical foundation. *Accounting, Auditing and Accountability*, 15(3): 282-311

- Deegan, C. (2013). The accountant will have a central role in saving the planet? A reflection on 'green accounting and green eyeshades twenty years later'. *Critical Perspectives on Accounting*, 24(6): 448-458. doi: <http://dx.doi.org/10.1016/j.cpa.2013.04.004>.
- Deegan, C. (2016). Twenty five years of social and environmental accounting research within Critical Perspectives of Accounting: Hits, misses and ways forward. *Critical Perspectives on Accounting*, 43: 65-87
- Edens, B. & Hein, L. (2013). Towards a consistent approach for ecosystem accounting. *Ecological Economics*, 90(0): 41-52
- El Serafy, S. (1997). Green accounting and economic policy. *Ecological Economics*, 21(3): 217-229. doi: [http://dx.doi.org/10.1016/S0921-8009\(96\)00107-3](http://dx.doi.org/10.1016/S0921-8009(96)00107-3)
- Environment Agency Japan (2010). OECD's Environmental Performance Reviews: Japan. 2010 https://www.env.go.jp/en/coop/poll_oecd.html
- Envirowise (2003). Increase your profits with environmental management accounting. GG 37. Eurowise, Oxfordshire.
- European Environment Agency (1998). Environmental management tools for SMEs: a handbook. [Adobe Digital Editions version]. Retrieved from <http://www.eea.eu.int>
- Fussel, L. and Georg, S. (2000). The Institutionalization of Environmental Concerns: Making the Environment Perform. *International Studies of Management & Organization*, 30(3), 41-58
- Gray, R. (2002). The social accounting project and accounting organizations and society privileging engagement, imaginings, new accountings and pragmatism over critique? *Accounting, Organizations and Society*, 27(7): 687-708
- Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations and Society*, 35(1): 47-62
- Gray, R. (2013). Back to basics: What do we mean by environmental (and social) accounting and what is it for?—A reaction to Thornton. *Critical Perspectives on Accounting*, 24: 459-468
- Ho, S.W. M, Ng, P.P.H. and Ng, A.Y.M. (1994). A study of Environmental Reporting in Hong Kong. *The Hong Kong Accountant*, 5(1): 62-65
- Hossain, D. M., Bir, A. T. S. L., Tarique, K. M. and Momen, A (2016). Disclosure of green banking issues in the annual reports: a study in Bangladeshi banks. *Middle East Journal of Business*, 55(3034), 1-12
- Hopwood, A. G., Unerman, J. & Fries, J. (2010). *Accounting for sustainability: Practical insights*. London: Earthscan.

- Hussain, M. D., Halim, M. S. B. A. & Bhuiyan, A. B. (2016). Environmental accounting and sustainable development: an empirical review. *International Journal of Business and Technopreneurship*, 6(2):335-350
- Jasch, C. (2018). Environmental management accounting: procedures and principles, United Nations division for sustainable development, department of economic and social affairs (United Nations Publication, Sales No. 01.II. A.3), 2001. Available from in several languages:<http://www.un.org/esa/sustdev/sdissues/technology/proceduresandprinciples.pdf>.
- KPMG (1993). *KPMG International Survey of Environmental Reporting*, KPMG Peat Marwick, Thorne.
- Khalid, F.M., Lord, B. R. and Dixon, K. (2012). Environmental management accounting implementation in environmentally sensitive industries in Malaysia.
- Mahmud, S., Ahammad, I. and Islam, M. N. (2013). Concept of Green Accounting and Its Practice in Bangladesh. *Journal of Science and Technology*, 3(2): 481-493
- Masud, M., Bae, S. and Kim, J. (2017). Analysis of Environmental Accounting and Reporting Practices of Listed Banking Companies in Bangladesh. *Sustainability*, 9(10), p. 1717
- Ministry of the Environment, Japan Government (2004). Environmental reporting guidelines. Retrieved from http://www.env.go.jp/policy/j-hiroba/PRG/pdfs/e_guide.pdf
- Neu, D., Warsame, H. and Pedwell, K. (1998). Managing Public impression; environmental disclosure in annual reports. *Accounting organization and society*. 23(3): 251-295
- Rahman, A. (1998). Application of Environmental Accounting in Bangladesh. *Journal of International Affairs*, 4(1):48-50
- Rahman and Muttakin (2005). "Corporate Environmental Reporting Practices in Bangladesh-A Study of Some Selected Companies. *The Cost & Management*, 33(4): 13-21
- Schaltegger, S., Hahn, T. and Burritt., R. L. (2000). Environmental Management Accounting – Overview and Main Approaches. Lueneburg: *Center for Sustainability Management*.
- Stasiskiene, Z, Staniskis, J. K. and Kliopova, I. (2004). Strategy of sustainable industrial development. Kaunas, Technologija (In Lithuanian).
- Unerman, J., Bebbington, J. and O'Dwyer, B. (Eds.). (2007). *Sustainability accounting and accountability*. Oxon: Routledge.
- Tu, J. and Huang, H. (2015). Analysis on the Relationship between Green Accounting and Green Design for Enterprises. *Sustainability*, 7: 6264-6277
- World Bank (2018). *Enhancing Opportunities for Clean and Resilient Growth in Urban Bangladesh-Country Environmental Analysis*. Washington DC: IBRD-IDA, World Bank group.