

CORPORATE ENVIRONMENTAL ACCOUNTING DISCLOSURE IN BANGLADESH

Shakhawat Hossain Sarkar¹, Razu Ahmed²

Associate Professor, Department of Accounting and Information Systems, Jatiya Kabi Kazi Nazrul Islam University, Trishal, Mymensingh 2224, Bangladesh.

Abstract: Corporate environmental accounting is a process of recording environmental costs arising from business activities and providing this information to the stakeholders to reduce environmental effects through the creation of awareness. The study endeavors to recognize the practices of corporate environmental accounting disclosures and its relationship with different corporate attributes using secondary sources of data collected through content analysis of annual reports applying the dichotomous procedure of 190 publicly traded companies listed in Dhaka Stock Exchange (DSE) in the year 2017. Statistical results depict that the Environmental Accounting Disclosure Index (EADI) is poor (mean 11.62 with a high SD 13.81) in the corporate sector under the study. EADI of the Banking sector is highest whereas the IT sector is lowest under the study. The regression model is well-fitted since the model is capable of explaining 63.2 percent of total variation by R² and 60.8 percent of total variation by AdjR². Regression results imply that company category, company nature, profit after tax, ISO 14001 certification, multi-nationality, company age, capital employed, and total revenue are statistically significant, but net assets value per share (NAVPS) and nature of dividend is statistically insignificant. To increase the environmental accounting disclosure, the Bangladesh Securities and Exchange Commission (BSEC) should take initiatives to put forward the environmental accounting disclosure as a regulatory requirement.

Key words: Environmental accounting, disclosure, environmental accounting disclosure index (EDI), publicly traded companies, Bangladesh.

Acknowledgment: The article is a part of the research project financed by Jatiya Kabi Kazi Nazrul Islam University, Trishal, Mymensingh-2224, Bangladesh.

INTRODUCTION

In recent years, environmental pollution becomes so acute, and the stakeholders' awareness of the issue becomes so serious that environmental accounting (EA) has become a strong branch of accounting (Pramanik, Shil & Das, 2007). Environmental reporting is a significant emerging tool in introducing environmental cost and other relevant environmental information to the stakeholders (Khan & Jui, 2016), to operationalized sustainability through EA and reporting as a business element, it become inevitable management tools in modern business (Krivačić & Janković, 2017) because EA measured and disclosed destructive environmental effects of companies (Noodezh & Moghimi, 2015).

Since environmental pollution in the industries is very alarming, hence it needs to justify how much they are delivering EA information in their annual reports in creating consciousness among the stakeholders of the organizations (Bhuiyan, Hossain & Akther, 2017, Ullah, Yakub & Hossain, 2013). The limitations of the conventional accounting system and the issue of corporate responsibility towards sustainable development have given birth to EA as a new branch of accounting (Khan & Jui, 2016). EA refers to the use of data about environmental costs and performance in business decisions and operations (Mehedy, Sajib & Karim, 2018), which can express in the context of Global, National, and Corporate EA (Khan & Jui, 2016). Corporate social-environmental disclosure has helped to

solve environmental issues ranging from environmental pollution, environmental litigation to proper EA and reporting (Emmanuel, Uwuigbe, Teddy, Tolulope, & Eyitomi, 2018). Accounting for the environment has become increasingly relevant to the enterprise as the pollution of the environment has become a more prominent economic, social, and political problem throughout the world (Pramanik, Shil & Das, 2008) that put force for corporations to engage in environmental responsibility including EA and reporting matters (Uwalomwa & Uadiale, 2011) including accounting for air pollution, water contamination, and natural resources extracting (Noodezh & Moghimi, 2015). The first environmental accounts were introduced by Norway in the 1970s and were slowly adopted by other countries (Shil & Iqbal, 2005). In the following years, many countries, like UK, USA, Canada, Japan, etc. actively researched EA information and have taken different crucial steps in environmental protection (Zhang et al. 2009 cited in Ullah, Yakub & Hossain, 2013). The goal of establishing an EA is to improve corporate environmental performance and long-term environmental sustainability (Krivačić & Janković, 2017) which is sub-divided into Environmental Management Accounting (EMA), has emerged during the last two decades, and Environmental Reporting (Coopers & Lybrand, 1998 cited in Khan & Jui, 2016). EMA has a focus on providing better information on the actual environmental costs already incurred by the entity to the management of an organization (Mehedy, Sajib & Karim, 2018; Ullah, Yakub & Hossain, 2013, Shil & Iqbal, 2005). EA is a budding issue as legislation on EA, is in the development phase in emerging markets, (Rafique, Malik, Waheed, & Khan, 2017) associated with the monitoring, measuring, and reporting of environmental information, i.e. information on the impact companies' have on the environment (Krivačić & Janković, 2017). The more EA information disclosure in annual reports of the companies supposed to create more awareness regarding the environment (Bhuiyan, Hossain & Akther, 2017, Ullah, Yakub & Hossain, 2013) that upgrades companies' existing environmental management systems, and therefore EA development can be perceived as "the new instrument of environmental management" (Schaltegger et al., 2002 cited in Krivačić & Janković, 2017). EA provides data that highlight both the contribution of natural resources to economic well-being and the costs imposed by pollution (Sultana, 2017)

that facilitates environmental costs management and reducing costs by making the relationships between costs and their underlying activities (Noodezh & Moghimi, 2015). EA seeks to provide financial information on the company's environmental expenditures, and the subsequent benefits include environmental protection and occupational safety and health that convert into fiscal or accounting data through systematics methods (Mehedy, Sajib & Karim, 2018). Companies are facing challenges in determining truly sustainable profit as there were no accounting standards specifically designed to deal with environmental issues (Ganapathy & Kabra, 2017). EA emerges as a tool to prove this commitment, where costs from business communities' point of view and effects from society's points of view are balanced (Shil & Iqbal, 2005). EA records and summarizes the value of environmental goods and services in monetary terms and also tries to evaluate the impact of organizational activities on environmental resources, which are widely responsible for the survival and development of an entity (Das, 2017). It includes specific issues of identification of environmental costs or expenses, capitalization of costs; identification of environmental liabilities; and measurement of liabilities (Pramanik, Shil & Das, 2007). Social performance information, social audit, social accounting, socio-economic accounting, social responsibility accounting, and social and environmental reporting have been used interchangeably in the literature (Hossain, Islam & Andrew, 2006).

Business houses and corporate enterprises are held responsible for ensuring a sustainable environment as their activities exert tension over the environmental structure so that EA has emerged during the last two decades in response to these issues (Uwalomwa & Uadiale, 2011). EA has introduced in Malaysia in the late 1990s, motivated by the opportunity to achieve sustainable growth and development as it is one of the elements that contribute to corporate governance (Nor, Bahari, Adnan, Kamal, & Ali, 2016). Comparatively, it's a new branch of accounting, also known as green accounting. In the developed world, the issue of environmental accounting became well-known, and they already started to disclose environmental issues in corporate annual reports, but in a developing country like Bangladesh, the EA and reporting are not so familiar. No accounting standard has issued for the accounting treatment of these specific problems (Pramanik, Shil &

Das, 2007). EA and reporting is an emerging concept in Bangladesh, although many countries in the world, either developed or developing, are already practicing EA and reporting (Sultana, 2017).

The above background and information guided us to find out the answer to some questions. What is the situation of environmental accounting disclosure practices in the corporate sector of Bangladesh? Is there any relationship between environmental accounting disclosure and company attributes? As a contemporary issue, the study is important from a different point of view. The study will enrich the existing stock of knowledge in the literature of contemporary accounting, especially environmental accounting. The study will provide messages to the concerned authorities for taking suitable policy measures regarding environmental protection through practices of environmental accounting so that the corporate sector make it operationalize to control environmental pollution. Moreover, future researchers may also get guidelines to conduct in-depth and extensive research in the field.

METHODOLOGY OF STUDY

Population and Sample

The research is empirical research based on secondary sources of data collected through content analysis of annual reports 2017 of publicly-traded companies in the Dhaka Stock Exchange (DSE) using a structured checklist. There are 584 companies listed in DSE of Bangladesh, including 268 companies (corporate bond, debenture, mutual funds, and treasury bonds), which nature of activities are dissimilar with all others. To generalize, these 268 companies exclude from the population. So the population includes 316 companies. According to Krejcie and Morgan table (1970 cited in KENPRO) for the determination of sample size of the finite population, the study required sample size of about 175 (175 samples for population size 320). The study considered 190 companies as a sample from different categories based on easy accessibility and availability on the internet. The annual reports have chosen as a basis for the data collection on environmental disclosure mainly due to annual reports are compulsory as they require by legislation and they are regularly produced especially by all listed companies and by these reasons making comparisons relatively easy (Tilt, 2001: 193 cited

in Akbas, 2014). Companies in the sample classify into 18 categories based on DSE classification (Table-1).

Table-1: Population and Sample

Categories	Population	Sample	Percent
Bank	30	18	60
Financial Institutions	23	16	70
Insurance	47	28	60
Pharmaceuticals and Chemicals	31	16	52
Jute	3	1	33
Textile	55	36	65
Cement	7	6	86
Services and Real Estate	4	4	100
Foods & Allied	17	10	59
Tannery Industries	6	4	67
Engineering	38	13	34
Ceramic Sector	5	5	100
Fuel and Power	19	13	68
Telecommunication	2	2	100
IT Sector	9	7	78
Paper and Printing	3	2	67
Travel & Leisure	4	0	0
Miscellaneous	13	9	69
Total	316	190	60

Source: DSE Website.

Measurement Procedure

Different types of analysis were used by earlier researchers to assess the level of environmental disclosure practices. Jerry, Teru, and Musa (2015), Ullah, Hossain, and Yakub (2014) used content analysis to collect data on environmental accounting disclosures. The content analysis defined as a method in which qualitative data are converted to quantitative data systematically to aid analysis (Collis & Hussey, 2014, cited in Sani, 2018). Ufere, Alias, Uche, and Onu (2017), Abubakar (2017) used several sentences as the unit of content analysis to collect data on environmental disclosures from the one-year annual report. Akbas (2014), Suttipun and Stanton (2012), Welbeck, Owusu, Bekoe, and Kusi (2017), Juhmani (2014), Cunningham and Gadenne (2003), Sani (2018) used the number of words as the unit of measurement through content analysis of the annual reports. Yusoff, Othman, and Yatim (2013) used content analysis on other corporate reports besides annual reports. Jose and Lee (2007) used a content analysis method under the prior coding

method, which requires a strong theoretical foundation for the coding categories to code the data. Masud, Bae, and Kim (2017) emphasize on the number of disclosure related to social and environmental reporting (SER) in 12 major categories with specific coding, whether presented in the annual report or not. Hossain, Islam, and Andrew (2006), Dyduch (2017), Habbash (2015), Bani-Khalid, Kouhy and Hassan (2017), Odoemelam and Okafor (2018), Burgwal and Vieira (2014), Carreira, Damião, Abreu, and David (2014) used disclosure index approach. Ullah, Hossain, and Yakub (2014), Mehedy, Sajib, and Karim, (2018), Emmanuel, Uwuigbe, Teddy, Tolulope, and Eyitomi, (2018), Bhuiyan, Hossain and Akther (2017), Ullah, Yakub and Hossain (2013), Khan and Jui, 2016), Faisal and Achmad (2014), Hewaidy (2016) used un-weighted disclosure index methodology. Prior works that adopted the unweighted method in counting disclosed items includes Hamid and Atan (2011), Amran and Haniffa (2011), Esa and Ghazali (2012), Ahmad and Haraf (2013), and Haji (2013), as cited in Emmanuel, Uwuigbe, Teddy, Tolulope, and Eyitomi, (2018). The main theme of the un-weighted disclosure index is that all items of the disclosed information in the index are considered equally crucial to the average users (Ullah, Yakub & Hossain, 2013). Guthrie and Abeysekera (2006 cited in Bani-Khalid, Kouhy & Hassan, 2017) reported that a disclosure index is a research instrument comprising a series of pre-selected items which, when scored, provide a measure that indicates a level of disclosure in the specific context for which the index devised. Uwalomwa and Uadiale (2011), Dutta and Bose (2008) used the content analysis method of data analysis with the dichotomous procedure, where a score of one

(1) awarded if an item reported; otherwise a score of zero (0). Ganapathy and Kabra, 2017 used content analysis to develop environmental disclosure index based on Global Reporting Initiative (GRI 3.1) and also on information on environmental regulations prevailing in India. Yusoff, Othman and Yatim (2013), Djajadikerta, and Trireksani (2012) used a modified disclosure index of Wiseman’s (1982) coding scheme to facilitate analysis of the content of disclosures. A mean score for each item of environmental information is used to measure the extensiveness of disclosures range from 1 to 4, are assigned according to the presence, and the degree of specificity for each group of environmental data and zero scores are assigned when no environmental item is present. Environmental disclosure extent index (EDEI) developed by Trireksani and Djajadikerta (2016). The scoring system described based on three dimensions, such as- evidence, time frame, and specificity. The total score ranges from zero to six for each company, and it represents a measure of environmental disclosure.

The study is considered content analysis to collect data through the dichotomous procedure using an un-weighted disclosure index approach where a score of one (1) awarded if an item reported; otherwise, a score of zero (0).

Information Items Included in the Index

To analyze environmental accounting disclosure practices, we need to develop a suitable index comprising items of the environmental accounting that are expected to include in the annual report of the company. To find out the levels of environmental accounting disclosure practices, 12 items selected through reviewing related literature (Table-1).

Table-1: Items of Environmental Accounting Disclosures

No.	Details of items
01	Past and current expenditure for pollution control equipment and facilities
02	Past and current operating costs of pollution control equipment and facilities
03	Future estimates of expenditures for pollution control equipment and facilities
04	Future estimates of operating costs for pollution control equipment and facilities
05	Financing for pollution control equipment or facilities
06	Maintain separate environmental accounting
07	Maintain separate records for environmental costs and or expenses
08	The entity has made a reasonably reliable estimate of the financial effects of the environmental risks
09	Management is aware of the existence and potential impact on the financial statements of any risk or liabilities arising as a result of pollution of soil, groundwater, surface water or air
10	Internal recording of actual or pending legal proceedings and fines and penalties for noncompliance
11	Development, review, and approval of accounting estimates included in the financial statements
12	Environmental risks covered by insurance

Scoring in the EADI and Analysis of Data

Under an un-weighted environmental disclosure index (EDI), all items of information (disclosure items) are considered equally important to the average user. The dependent variable is determined as environmental accounting disclosure index (EADI) of each company as follows:

$$EADS = \sum_{i=1}^n d_i = \sum_{i=1}^n d_i$$

Where,

d_i = One if the company disclosed the item d_i

d_i = 0 if the company does not disclose the item d_i

d_i

n = number of items

EADI of each company computed by using the following formula:

$$EADI = \frac{\text{EADS of Individual Company}}{\text{Maximum Possible Score Obtainable}} \times 100$$

Oppenheim (1992, cited in Bani-Khalid, Kouhy & Hassan, 2017) argues that the process of selecting an appropriate statistical technique should base on the nature of the data targeted. Based on nature the suggestion the data is analyzed using two key methods, namely; (i) descriptive analysis like frequency, mean, SD, percentile to identify the level of environmental accounting disclosure of the company traded in DSE; and (ii) OLS regression analysis is made using the SPSS (Statistical Packages for Social Science) version 20 software, in order to investigate the relationships between corporate characteristics and the level of environmental disclosure.

Model and Method of Estimation

To investigate the relationship between company characteristics and the volume of environmental disclosure, the following ordinary least square (OLS) regression model with cross-sectional data is estimated:

$$EADI = \alpha_0 - \beta_1 ComCat_i + \beta_2 ComNat_i + \beta_3 NAVPS_i + \beta_4 ProATax_i + \beta_5 NatDiv_i + \beta_6 ISO_i + \beta_7 MulNat_i + \beta_8 Age_i + \beta_9 CapEmp_i + \beta_{10} TotRev_i + \epsilon_i$$

Where:

EADI: the extent of environmental accounting

disclosure of company i in 2017 (environmental accounting disclosure index)

α_0 : intercept

ϵ = random error term

ComCat = Company Category (such as bank, financial institutions, insurance, cement, etc.)

ComNat = Company Nature (such as manufacturing, non-manufacturing)

NAVPS = Net Assets Value Per Share

$$NAVPS = \frac{\text{Assets} - \text{Liabilities}}{\text{Total number of outstanding shares}}$$

ProATax = Profit after Tax

NatDiv = Nature of Dividend (cash dividend, stock dividend, and cash and stock both)

ISO = ISO 14001 certification

MulNat = Multi-nationality

Age = age of establishment of the company i as of 2017

CapEmp = Capital Employed (Equity capital plus debt capital employed)

TotRev = Total Revenue (operating and non-operating revenues)

LITERATURE REVIEW

The related and relevant available literature on the internet at home and abroad reviewed. The outcome of the review of the literature is summarized below.

Bhuiyan, Hossain, and Akther (2017) discovered that the company's total assets, gross revenue, and EPS have a positive relationship with the level of environmental accounting disclosure, whereas the company's age has a negative relationship of 30 manufacturing companies listed in DSE using environmental accounting disclosure index.

Biswas and Rahaman (2012) identified that the BFRS did not enable firms to disclose key environmental information and a careful examination of the existing ICAB (Institute of Chartered Accountants of Bangladesh) standards for improving the current set of

financial statements, and the production of a mandated separate statement of environmental assets and liabilities.

Bose (2006) identified that Petrobangla and its companies in Bangladesh do not maintain environmental accounting, only shows positive environmental information either in the Chairman's statement or Director's report, and has developed the guidelines for "Environment and Safety Practice" for itself and its companies but not shown the practices of the guidelines in annual report, do not show any information regarding waste generation, conservation of energy, water wastage, recycling of waste, noise nuisance, etc. using primary and secondary sources of data.

Comoglio and Botta (2012 cited in Passetti, Cinquini, Marelli & Tenucci, 2014) have shown that Italian firms in the automotive industry use a large number of environmental performance indicators to monitor several environmental aspects such as waste management, natural resources, air emission, and water use cost reduction.

Islam, Hosen, and Islam (2005) revealed that not a single company had provided quantitative and financial data regarding environmental disclosure in their annual reports.

Masud, Bae, and Kim (2017) indicate that banks disclosed the environmental information for green banking and renewable energy categories, and the yearly disclosure of environmental information increased sharply from 16 percent in 2010 to 83 percent in 2014 in Bangladesh.

Mehedy, Sajib, and Karim (2018) indicate that a few organizations are uncovering more information concerning environmental issues in DSE listed companies. They found that environmental accounting disclosure practices are positively related to total assets, gross revenues, and EPS whereas a negative relationship with the age of the companies.

Nguyen, Tran, Nguyen and Le (2017) showed the disclosure levels of environmental accounting information of 74 construction firms in Vietnam, from the period of 2013 to 2016, tends to increase, especially in 2016 and the level of disclosure is influenced by factors of firm size, profitability, financial leverage, number of year's listed and independent audit.

Pramanik, Shil, and Das (2008) recognized that the level of voluntary environmental disclosures in the corporate annual reports, both financial and non-

financial, is not an encouraging level due to neither the company law nor the accounting standards/guidelines in India related to disclosure of the environmental matter in the corporate financial statement.

Shil and Iqbal (2005) find out that no companies listed in DSE disclose environment-related quantitative information; companies only disclosed qualitative information in the directors' reports to the shareholders using secondary sources of data.

Using both primary and secondary data, Sultana (2017) identified that the Petrobangla and its companies do not maintain any provision for contingent environmental liability, there is no determination and classification of environmental expenditures, only show positive environmental information, do not show any negative information, information regarding waste generation, conservation of energy, water wastage and recycling of waste, noise nuisance and so on either in the Chairman's statement or Director's report.

Reviewed literature designates that environmental accounting is a contemporary issue of research all over the world. There is a prospect to study the practices of environmental accounting disclosure and its relationship with companies' attributes of DSE listed companies in Bangladesh using a large sample. That's why the present study attempts to fill up this gap.

ANALYSIS AND DISCUSSION

Data is analyzed and discussed the results here divided into four parts of the section. In the first part, each item of environmental accounting presented in a table with a brief interpretation. In the second part, environmental accounting compliance practices presented through descriptive statistics. In the third part, a model developed for the study problem.

ENVIRONMENTAL ACCOUNTING DISCLOSURE practices

The nature and extent of the environmental accounting disclosure have analyzed and discussed through descriptive statistics based on company nature, i.e. manufacturing and non-manufacturing.

Past and current expenditure for pollution control equipment and facilities

Table-2 reveals that only 24 percent of companies

under the study comply with the variable of ‘past and current expenditure for pollution control equipment and facilities’ where manufacturing companies comply 26 percent and non-manufacturing companies comply 21 percent. The compliance rate of the variable (24 percent) is higher than the EADI (11.62). Dyduch (2017) stated that the most frequently disclosed information in the annual report of the companies of Poland is capital expenditure on environmental protection initiatives.

Table-2: Distribution of past and current expenditure for pollution control equipment and facilities

Nature of Companies	Past and current expenditure for pollution control equipment and facilities		Total
	Yes	No	
Manufacturing	26 (26%)	74 (74%)	100 (100%)
Non-manufacturing	19 (21%)	71 (79%)	90 (100%)
Total	45 (24%)	145 (76%)	190 (100%)

Source: Analysis of Data.

Past and current operating costs for pollution control equipment and facilities

Table-3 reveals that only 5 percent of companies under the study comply with the variable of ‘past and current operating costs for pollution control equipment and facilities’ where manufacturing companies comply 6 percent and non-manufacturing companies comply 4 percent. The compliance rate of the variable (5 percent) is more than two times lower than the EADI (11.62).

Table-3: Distribution of past and current operating costs for pollution control equipment and facilities

Nature of Companies	Past and current operating costs for pollution control equipment and facilities		Total
	Yes	No	
Manufacturing	6 (6%)	94 (94%)	100 (100%)
Non-manufacturing	4 (4%)	86 (96%)	90 (100%)
Total	10 (5%)	180 (95%)	190 (100%)

Source: Analysis of Data.

Future estimates of expenditures for pollution control equipment and facilities

Table-4 reveals that only 3 percent of companies under the study comply with the variable of ‘future estimates of expenditure for pollution control equipment and facilities’ where manufacturing companies comply 5 percent and no non-manufacturing companies comply. The compliance rate of the variable (3 percent) is about four times lower than the EADI (11.62).

Table-4: Distribution of future estimates of expenditures for pollution control equipment and facilities

Nature of Companies	Future estimates of expenditures for pollution control equipment and facilities		Total
	Yes	No	
Manufacturing	5 (5%)	95 (95%)	100 (100%)
Non-manufacturing	0 (0%)	90 (100%)	90 (100%)
Total	5 (3%)	185 (95%)	190 (100%)

Source: Analysis of Data.

Future estimates of operating costs for pollution control equipment and facilities

Table-5 reveals that only 6 percent of companies under the study have complied with the variable of ‘future estimates of operating costs for pollution control equipment and facilities’ where manufacturing companies have complied 8 percent and non-manufacturing companies complied 4 percent. The compliance rate of the variable (6 percent) half compared to EADI (11.62).

Table-5: Distribution of future estimates of operating costs for pollution control equipment and facilities

Nature of Companies	Future estimates of operating costs for pollution control equipment and facilities		Total
	Yes	No	
Manufacturing	8 (8%)	92 (92%)	100 (100%)
Non-manufacturing	4 (4%)	86 (96%)	90 (100%)
Total	12 (6%)	178 (94%)	190 (100%)

Source: Analysis of Data.

Financing for pollution control equipment or facilities

Table-6 reveals that 48 percent of companies under the study have complied with the variable of ‘financing for pollution control equipment or facilities’ where manufacturing companies complied 55 percent and non-manufacturing companies complied 41 percent. The compliance rate of the variable (48 percent) is about five times higher than the EADI (11.62).

Table-6: Distribution of financing for pollution control equipment or facilities

Nature of Companies	Financing for pollution control equipment or facilities		Total
	Yes	No	
Manufacturing	55 (55%)	45 (45%)	100 (100%)
Non-manufacturing	37 (41%)	53 (59%)	90 (100%)
Total	92 (48%)	98 (52%)	190 (100%)

Source: Analysis of Data.

Maintain separate environmental accounting

Table-7 reveals that only 9 percent of companies under the study have complied with the variable of ‘maintain separate environmental accounting’ where manufacturing companies complied with 3 percent and non-manufacturing companies complied 14 percent. The compliance rate of the variable (9 percent) is lower than the EADI (11.62) though non-manufacturing companies complied greater than the EADI.

Table-7: Distribution of maintaining separate environmental accounting

Nature of Companies	Maintain separate environmental accounting		Total
	Yes	No	
Manufacturing	3 (3%)	97 (97%)	100 (100%)
Non-manufacturing	14 (16%)	76 (84%)	90 (100%)
Total	17 (9%)	173 (91%)	190 (100%)

Source: Analysis of Data.

Maintain separate records for environmental costs and or expenses

Table-8 reveals that 11 percent of companies under

the study have complied with the variable of ‘maintain separate records for environmental costs and or expenses’ where manufacturing companies complied 8 percent and non-manufacturing companies complied 13 percent. The compliance rate of the variable (11 percent) is about equal to the EADI (11.62).

Table-8: Distribution of maintaining separate records for environmental costs and or expenses

Nature of Companies	Maintain separate records for environmental costs and or expenses		Total
	Yes	No	
Manufacturing	8 (8%)	92 (92%)	100 (100%)
Non-manufacturing	12 (13%)	78 (87%)	90 (100%)
Total	20 (11%)	170 (89%)	190 (100%)

Source: Analysis of Data.

Made estimates of the financial effects of the environmental risks

Table-9 reveals that only 14 percent of companies under the study have complied with the variable of ‘made estimates of the financial effects of the environmental risks’ where manufacturing companies complied with 12 percent and non-manufacturing companies complied 16 percent. The compliance rate of the variable (14 percent) is higher than the EADI (11.62).

Table-9: Distribution of estimates of the financial effects of the environmental risks

Nature of Companies	Made estimates of the financial effects of the environmental risks		Total
	Yes	No	
Manufacturing	12 (12%)	88 (88%)	100 (100%)
Non-manufacturing	14 (16%)	76 (84%)	90 (100%)
Total	26 (14%)	164 (86%)	190 (100%)

Source: Analysis of Data.

Management’s awareness regarding the impact on the financial statements of any risk or liabilities arising from pollution

Table-10 reveals that only 12 percent companies under the study have complied with the variable of ‘management is aware regarding the impact on the

financial statements of any risk or liabilities arising as a result of pollution of soil, groundwater, surface water or air' where manufacturing companies complied 17 percent and non-manufacturing companies complied 6 percent. The compliance rate of the variable (12 percent) is about equal to the EADI (11.62).

Table-10: Distribution of management awareness regarding the impact of any risk of liabilities arising from pollution of soil, groundwater, surface water or air

Nature of Companies	Management is aware of the risk or liabilities		Total
	Yes	No	
Manufacturing	17 (17%)	83 (83%)	100 (100%)
Non-manufacturing	5 (6%)	85 (94%)	90 (100%)
Total	22 (12%)	168 (88%)	190 (100%)

Source: Analysis of Data.

Internal record of actual or pending legal proceedings and fines and penalties for noncompliance

Table-11 reveals that only 2 percent of companies under the study have complied with the variable of 'internal recording of actual or pending legal proceedings and fines and penalties for noncompliance' where manufacturing companies complied 4 percent and no non-manufacturing companies complied regarding the issue. The compliance rate of the variable (2 percent) is about six times lower than the EADI (11.62).

Table-11: Distribution of internal recording of actual or pending legal proceedings and fines and penalties for noncompliance

Nature of Companies	Internal recording of actual or pending legal proceedings and fines and penalties for noncompliance		Total
	Yes	No	
Manufacturing	4 (4%)	96 (96%)	100 (100%)
Non-manufacturing	0 (0%)	90 (100%)	90 (100%)
Total	4 (2%)	186 (98%)	190 (100%)

Source: Analysis of Data.

Development, review and approval of accounting estimates in the financial statements

Table-12 reveals that only 0.5 percent of companies under the study have complied with the variable of 'development, review, and approval of accounting estimates included in the financial statements' where manufacturing companies complied with one percent and no non-manufacturing companies complied regarding the issue. The compliance rate of the variable (0.5 percent) is about twenty-three times lower than the EADI (11.62).

Table-12: Distribution of development, review, and approval of accounting estimates included in the financial statements

Nature of Companies	Development, review, and approval of accounting estimates included in the financial statements		Total
	Yes	No	
Manufacturing	1 (1%)	99 (99%)	100 (100%)
Non-manufacturing	0 (0%)	90 (100%)	90 (100%)
Total	1 (0.5%)	186 (98%)	190 (100%)

Source: Analysis of Data.

Environmental risks covered by insurance

Table-12 reveals that only 0.5 percent of companies under the study have complied with the variable of 'environmental risks covered by insurance' where manufacturing companies complied with one percent, and no non-manufacturing companies complied regarding the issue. The compliance rate of the variable (0.5 percent) is about twenty-three times lower than the EADI (11.62).

Table-13: Distribution of environmental risks covered by insurance

Nature of Companies	Environmental risks covered by insurance		Total
	Yes	No	
Manufacturing	1 (1%)	99 (99%)	100 (100%)
Non-manufacturing	0 (0%)	90 (100%)	90 (100%)
Total	1 (0.5%)	186 (98%)	190 (100%)

Source: Analysis of Data.

Descriptive Statistics of EADI

Evident from table-14, mean EADI is 11.62, which is a poor index with a high deviation of EADI among the companies as high standard deviation (13.81) and a large volume of range (58.33). The variation implies that the mean is not perfectly able to represent the overall scenario due to a high deviation of EADI among the companies. Statistical results indicate that though the mean index is 11.62 mode is 0 (zero), which indicates that a large number of companies (36.8 percent) does not disclose any information regarding environmental accounting in Bangladesh under the study. The result is consistent with Dyduch (2017) which shows approximately 39 percent of the companies of Poland have not provided any environment-related financial information in their annual report 2015. On the other hand, Dyduch (2017) also find out that the overall index value is 16.37 percent.

Table – 14: Descriptive Statistics of EDI

Mean	11.62
Maximum	58.33
Minimum	00
Range	58.33
Standard Deviation	13.81
Standard Error of the mean	1.00
Mode	00

Source: Analysis of Primary Data.

Environmental Accounting Disclosure Score

The study results indicate that (table-15) only 1.6 percent (3 companies) companies under the study secure the highest score (7 out of 12) whereas 36.8 percent of companies did not disclose any information regarding environmental accounting in the annual report of the company. A large number of companies (30 percent) disclosed 1 item under the study. Dutta and Bose (2008) discovered that not a single company in Bangladesh disclosed quantitative facts such as expenditure incurred or targets set and achieved. Though the score of environmental accounting information is low but increasing.

Table –15: Environmental Accounting Disclosure Levels

EDS (Out of 12)	Frequency	Percent	Cumulative Percent
0	70	36.8	36.8
1	57	30.0	66.8
2	29	15.3	82.1
3	9	4.7	86.8
4	13	6.8	93.7
5	4	2.1	95.8
6	5	2.6	98.4
7	3	1.6	100
Total	190	100.0	

Source: Analysis of data.

Environmental Accounting Disclosure Index (EADI) based on Company Category

It is evident from Table-16 that the Banking companies under the study obtained the highest EADI score (mean 28.24 and SD 9.96), Tannery industries secure second (mean 20.83 and SD 25.91), Pharmaceuticals and Chemical industries secure third (mean 17.71 and SD 20.16), Financial institutions secure the fourth position (mean 15.10 and SD 17.00), Engineering companies got the fifth position (mean 14.74 and SD 17.06), Cement companies secure sixth position (mean 12.50 and SD 6.97), Textile companies secure seventh position (mean 10.88 and SD 10.51), Food and Allied companies secure eighth position (mean 9.17 and SD 15.44), Jute companies secure ninth position (mean 8.33 with no SD), Fuel and Power companies secure tenth position (mean 8.33 and SD 7.61), Telecommunication, and Paper & Printing companies secure jointly eleventh position (mean 8.33 and SD 11.78), Service and Real Estate companies secure twelfth position (mean 6.25 and SD 7.98), Ceramic companies secure thirteenth position (mean 5.00 and SD 4.56), Insurance companies secure fourteenth position (mean 4.17 and SD 5.32), and Miscellaneous sector secure fifteenth position (mean 2.78 and SD 4.17) in order to EADI whereas IT sector gained the lowest EADI (mean 0.00 and SD 0.00). Considering the above result it is clear that IT sector, Services & Real Estate, Miscellaneous, Insurance, Ceramic, Jute, Telecommunication, Paper & Printing companies under the study are comparatively inferior position than Bank, Tannery, Pharmaceuticals & Chemical, Financial Institutions, Cement, Tannery,

Textile companies regarding environmental accounting disclosure practices. Dyduch (2017) had identified that companies in Poland disclose environment-related financial information in their annual report 2015 ranged from 3.33 percent (plastic industry) to 66.67 percent (energy sector).

Table-16: EADI based on Company Category

Categories	EADI	Obtainable EADI	SD	Sample Size
Bank	28.24	100	9.96	18
Financial Institutions	15.10	100	17.00	16
Insurance	4.17	100	5.32	28
Pharmaceuticals and Chemicals	17.71	100	20.16	16
Jute	8.33	100	.	1
Textile	10.88	100	10.51	36
Cement	12.50	100	6.97	6
Services and Real Estate	6.25	100	7.98	4
Foods and Allied	9.17	100	15.44	10
Tannery	20.83	100	25.91	4
Engineering	14.74	100	17.06	13
Ceramic	5.00	100	4.56	5
Fuel and Power	8.33	100	7.61	13
Telecommunication	8.33	100	11.78	2
IT Sector	.00	100	.00	7
Paper and Printing	8.33	100	11.78	2
Miscellaneous	2.78	100	4.17	9
Total	11.62	100	13.81	190

Source: Analysis of Data.

Environmental Accounting Disclosure Index (EADI) based on Company Nature

It is evident from Table-17 that the manufacturing companies under the study obtained the highest EADI score (mean 11.83 and SD 14.27), whereas non-manufacturing companies secure the lowest EADI score (mean 11.39 and SD 13.36). Bhuiyan, Hossain, and Akther (2017) reveal that the environmental accounting disclosure index of manufacturing companies in Bangladesh was 16.37 base on 30 sampled companies listed in DSE.

Table-17: EADI based on Company Nature

Categories	EADI	Obtainable EADI	SD	Sample Size
Manufacturing	11.83	100	14.27	100
Non-manufacturing	11.39	100	13.36	90
Total	11.62	100	13.81	190

Source: Analysis of Data.

Results of Regression Analysis

In table- 20 the estimated value for company category is -.668 and its t-value is -4.557 with p-value .000, the

estimated value for nature of company is -4.205 and its t-value is -2.786 with p-value .006, the estimated value for NAVPS is .012 and its t-value is 1.266 with p-value .208, the estimated value for profit after tax is -.001 and its t-value is -3.356 with p-value .001, the estimated value for nature of dividend is 1.165 and its t-value is 1.367 with p-value .173, the estimated value for ISO 14001 certification is 23.225 and its t-value is 7.952 with p-value .000, the estimated value for multi-nationality is 18.461 and its t-value is 2.993 with p-value .003, the estimated value for company age is .366 and its t-value is 6.016 with p-value .00, the estimated value for capital employed is .00005383 and its t-value is 7.272 with p-value .000, and the estimated value for total revenue is .00009887 and its t-value is 2.041 with p-value .043. Statistical results indicate that the company category, nature of company, profit after tax, ISO 14001 certification, multi-nationality, age of the company, capital employed, and total revenue are statistically significant, but NAVPS and nature of dividends are statistically insignificant at a 5 percent level of significance. The Variance inflation factor (VIF) values for all ten independent variables are less than five which indicates a lack of multi-collinearity in the data. Upon review of the correlation matrix, the highest value is 0.698 which is lower than the value of 0.7 ± 1 . Result of

correlation matrix testimony that there is no variable with a higher correlation in the data set. The Durban Watson test statistics value is 1.887 which is in the normal range of 1.5 to 2.5. Field (2009) suggests that values under one or more than 3 are a definite cause for concern. So the result indicates that there is no autocorrelation. Histogram (Figure-1) and Normal P-P plot regression standardized

residual (Figure-2) indicate that the data set is normally distributed. The R^2 value for this model is 0.632, and the Adj R^2 value is 0.608 (Table-18), which implies that the predictor variables can explain about 63.2 percent of total variation by R^2 and about 60.8 percent of total variation by Adj R^2 .

$$EADI = 7.318 - 0.668 \text{ ComCat} - 4.205 \text{ ComNat} + 0.012 \text{ NAVPS} - 0.001 \text{ ProATax} + 1.165 \text{ NatDiv} + 23.225 \text{ ISO} + 18.461 \text{ MulNat} + 0.366 \text{ Age} + 0.00005383 \text{ CapEmp} + 0.00009887 \text{ TotRev}$$

Table-18: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.795 ^a	.632	.608	8.81309	1.887

a. Predictors: (Constant), Total Revenue (in Million Taka), Nature of Company, ISO 14001 certified, Nature of Dividend, Company Category, NAVPS (in Taka), Age, Capital Employed (in Million Taka), Multi-nationality, Profit after tax (in Million Taka)

b. Dependent Variable: EADI

Table-19: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	21033.453	10	2103.345	27.080	.000 ^b
	Residual	12271.938	158	77.670		
	Total	33305.391	168			

a. Dependent Variable: EADI

b. Predictors: (Constant), Total Revenue (in Million Taka), Nature of Company, ISO 14001 certified, Nature of Dividend, Company Category, NAVPS (in Taka), Age, Capital Employed (in Million Taka), Multi-nationality, Profit after tax (in Million Taka)

Table-20: Regression Coefficients^a

Model	Regression Coefficients	t	P value	Collinearity Statistics	
	B			Tolerance	VIF
(Constant)	7.318	1.982	.049		
Company Category	-.668	-4.557	.000	.844	1.185
Nature of Company	-4.205	-2.786	.006	.808	1.237
NAVPS	.012	1.266	.208	.680	1.471
Profit after Tax	-.001	-3.356	.001	.406	2.463
Nature of Dividend	1.165	1.367	.173	.929	1.076
ISO 14001 Certified	23.225	7.952	.000	.885	1.129
Multi-nationality	18.461	2.993	.003	.523	1.913
Age	.366	6.016	.000	.749	1.335
Capital employed	.00005383	7.272	.000	.720	1.389
Total Revenue	.00009887	2.041	.043	.412	2.428

a. Dependent Variable: FACI

Source: Regression coefficient of data.

Fig.-1: Histogram

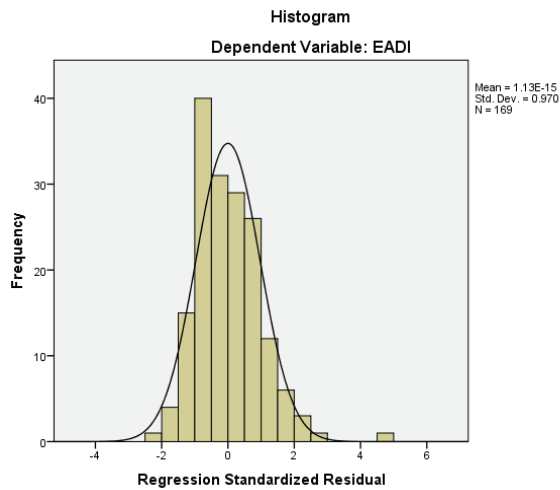
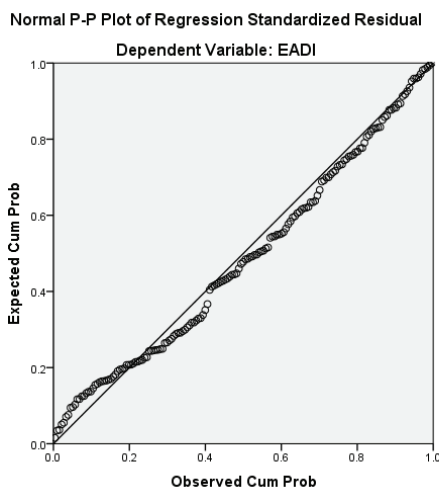


Fig.-2: Normal P –P Plot of Regression Standardized Residual



CONCLUSION

Environmental accounting is a new branch of accounting concerned with recording environmental costs and benefits and providing environmental accounting information to interested users. It began in Norway in the 1970s and expanded slowly in the developed world. The expansion is growing up rapidly worldwide after the 1990s as a result of the increasing trend of environmental degradation in terms of increases in global warming, air pollution, water pollution, unplanned waste removal, unplanned industrialization without taking into consideration of environmental threats, bio-diversity, greenhouse effects, etc. The study is an attempt to find out the level of environmental accounting disclosure

practices in the corporate sector in Bangladesh. Statistical results imply that the environmental reporting practices scenario in terms of EADI of companies traded in DSE is 11.62 with a high deviation (SD 13.81). Based on the company category, the banking companies secure the highest EADI (mean 28.24 and SD 9.96) and IT sector secure lowest EADI (mean 0.00 and SD 0.00). T-statistic implies that there is a significant relationship between the company category and EADI.

On the other hand, based on the nature of the company, manufacturing companies disclosed greater environmental accounting information (mean EADI 11.83 and SD 14.27) than non-manufacturing companies (mean EADI 11.39 and SD 13.36). T-statistic testimony that there is a significant relationship between company category and EADI. It is a matter of concern that till now, about 36.80 percent of companies are not disclosing any information relating to environmental accounting. Only 6.3 percent of companies disclose 5 to 7 out of 12 items of environmental accounting whereas more than 45 percent of companies disclose only 1 to 2 items under the study. The study has developed a model of EADI in which predictor variables can explain about 63.20 percent of total variation by R^2 and about 60.8 percent of total variation by $AdjR^2$. All variables other than NAVPS, and nature of dividend are statistically significant at 5 percent level of significance. So the model is well-fitted.

References

- Abubakar, A.A. (2017). Influence of firms' attributes on environmental disclosure in listed brewery companies in Nigeria. *Research Journal of Finance and Accounting*, 8(21), 31-35.
- Ahmad, A. (2012). Environmental accounting & reporting practices: Significance and issues: A case from Bangladeshi companies. *Global Journal of Management and Business Research*, 12(14)1, 119-127.
- Akbas, H.E. (2014). Company characteristics and environmental disclosure: An empirical investigation on companies listed on the Borsa Istanbul 100 index. *The Journal of Accounting and Finance*, April/2014, 145-163.
- Bani-Khalid, T., Kouhy, R. & Hassan, A. (2017). The impact of corporate characteristics on social and environmental disclosure (CSED): The case of Jordan. *Journal of Accounting and Auditing: Research & Practice*, 2017(2017), 1-28. DOI: 10.5171/2017.369352

- Bhuiyan, M.N.U., Hossain, S.M.K. & Akther, F. (2017). Environmental reporting practices and its relationship with corporate characteristics: An evidence from manufacturing companies listed in the Dhaka Stock Exchange (DSE). *The Cost and Management: The Journal of the Institute of Cost and Management Accountants of Bangladesh*, 45(1), 3-11.
- Biswas, M.I. & Rahaman, M.M. (2012). Bangladesh financial reporting standard (BFRS) and environmental accounting: A case study of listed manufacturing companies in Bangladesh. *Journal of Business and Technology (Dhaka)*, 6(2)2011& (7(1) 2012, 1-20.
- Bose, S. (2006). Environmental accounting and reporting in fossil fuel sector: A study on Bangladesh oil, gas, and mineral corporation (Petrobangla), *The Journal of the Institute of Cost and Management Accountants of Bangladesh*, 34(2), 53-67.
- Burgwal, D.V. & Vieira, R.J.O. (2014). Environmental Disclosure Determinants in Dutch Listed Companies. *USP Sao Paulo*, 25(64), 60-78.
- Carreira F., Damião A., Abreu R. & David F. (2014). Environmental disclosure - from the accounting to the report perspective. *16th International Conference on Enterprise Information Systems*, 496-501. DOI: 10.5220/0004973604960501
- Cunningham, S. & Gadenne, D. (2003). Do corporations perceive mandatory publication of pollution information for key stakeholders as a legitimacy threat? *Journal of Environmental Assessment Policy and Management*, 5(4), 523-549. www.worldscientific.com
- Das, P. K. (2017). An introduction to the concept of environmental accounting and reporting- Indian scenario. *Imperial Journal of Interdisciplinary Research*, 3(4), 13-22.
- Djajadikerta, H.G. & Trireksani, T. (2012). Corporate social and environmental disclosure by Indonesian listed companies on their corporate web sites. *Journal of Applied Accounting Research*, 13(1), 21-36. DOI 10.1108/09675421211231899
- Dutta, P. & Bose, S. (2008). Corporate environmental reporting on the internet in Bangladesh: An exploratory study. *International Review of Business Research Papers*, 4(3), 138-150. Retrieved from https://www.researchgate.net/publication/241531872_Corporate_Environmental_Reporting_on_the_Internet_in_Bangladesh_An_Exploratory_Study
- Dyduch, J. (2017). Financial environmental disclosure in the annual reports of listed companies in Poland. *International Journal of Trade, Economics and Finance*, 8(3), 169-174. DOI: 10.18178/ijtef.2017.8.3.557
- Emmanuel, O., Uwuigbe, U., Teddy, O., Tolulope, I. & Eyitomi, G.A. (2018). Corporate diversity and corporate social environmental disclosure of listed manufacturing companies in Nigeria. *Problems and Perspectives in Management*, 16 (3), 229-244. DOI: 10.21511/ppm.16(3).2018.19
- Faisal, F. & Achmad, T. (2014). Internal contextual factors influencing the extent of environmental disclosure. *Int. J. Managerial and Financial Accounting*, 6(4), 357-374.
- Ganapathy, E. & Kabra, K.C. (2017). The impact of corporate governance attributes on environmental disclosures: Evidence from India. *Indian Journal of Corporate Governance*, 10(1) 24-43. DOI: 10.1177/0974686217701464
- Habbash, M. (2015). Corporate governance, ownership, company structure and environmental disclosure: Evidence from Saudi Arabia. *Journal of Governance and Regulation*, 4(4), 460-470.
- Hewaidy, A.M. (2016). Social and environmental disclosure in corporate annual reports: Evidence from Kuwait. *International Journal of Social Sciences and Management*, 3(1), 8-16. DOI: 10.3126/ijssm.v3i1.14219
- Hossain, M. A., Islam, K. S., & Andrew, J. (2006). Corporate social and environmental disclosure in developing countries: Evidence from Bangladesh. *The Asian Pacific Conference on International Accounting Issues*, Hawaii. <http://ro.uow.edu.au/commpapers/179>
- Islam, S., Hosen, A. & Islam, M. (2005). An examination of corporate environmental disclosure by the Bangladeshi public limited companies. *Pakistan Journal of Social Sciences*, 3(9), 1095-1102.
- Jerry, M. S., Teru, P. & Musa, B. (2015). Environmental accounting disclosure practice of Nigerian quoted firms: A case study of some selected quoted consumer goods companies. *Research Journal of Finance and Accounting*, 6(22), 31-37.
- Jose, A. & Lee, S. (2007). Environmental reporting of global corporations: A content analysis based on website disclosures. *Journal of Business Ethics*, (2007)72, 307-321. DOI 10.1007/s10551-006-9172-8
- Juhmani, O. (2014). Determinants of corporate social and environmental disclosure on websites: the case of Bahrain. *Universal Journal of Accounting and Finance*, 2(4), 77-87. DOI: 10.13189/ujaf.2014.020402
- KENPRO. Sample Size Determination Using Krejcie and Morgan Table. <http://www.kenpro.org/sample-size-determination-using-krejcie-and-mo>.
- Khan, M.F.R. & Jui, R.P. (2016). Environmental reporting practices: A Study on selected manufacturing companies in Bangladesh. *The Cost and Management: The Journal of the Institute of Cost and Management Accountants of Bangladesh*, 44(4), 36-48.

- Krivačić, D. & Janković, S. (2017). Managerial attitudes on environmental reporting: Evidence from Croatia. *Journal of Environmental Accounting and Management*, 5(4), 327-341. DOI:10.5890/JEAM.2017.12.005
- Masud, M. A. K., Bae, S. M. & Kim, J. D. (2017). Analysis of environmental accounting and reporting practices of listed banking companies in Bangladesh. *Sustainability*, 9, 1717, 1-19. DOI:10.3390/su9101717
- Mehedy, S.R., Sajib, H.M. & Karim, R. (2018). Environmental reporting practices of listed companies in Bangladesh. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 8 (3): 178-193. DOI: 10.6007/IJARAFMS/v8-i3/4759
- Nguyen, L.S., Tran, M.D., Nguyen, T.X.H., & Le, Q.H. (2017). Factors affecting disclosure levels of environmental accounting information: The case of Vietnam. *Accounting and Finance Research*, 6(4), 255-264. DOI:10.5430/afr.v6n4p255
- Noodezh, H.R. & Moghimi, S. (2015). Environmental costs and environmental information disclosure in the accounting systems. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 5(1), 13–18. DOI: 10.6007/IJARAFMS/v5-i1/1412
- Nor, N.M., Bahari, N.A.S., Adnan, N.A., Kamal, S.M.Q.A.S. & Ali, I.M. (2016). The Effects of environmental disclosure on financial performance in Malaysia. *Procedia Economics and Finance*, 35, 117 – 126. DOI: 10.1016/S2212-5671(16)00016-2
- Odoemelam, N., & Okafor, R.G. (2018). The influence of corporate governance on environmental disclosure of listed non-financial firms in Nigeria. *Indonesian Journal of Sustainability Accounting and Management*, 2(1), 25–49. DOI:10.28992/ijSAM.v2i1.47
- Passetti, E., Cinquini, L., Marelli, A. & Tenucci, A. (2014). Sustainability accounting in action: Lights and shadows in the Italian context. *The British Accounting Review*, 46, 295-308. <http://dx.doi.org/10.1016/j.bar.2014.05.002>
- Pramanik, A. K., Shil, N. C., & Das, B. (2007): *Environmental accounting and reporting with special reference to India. The Journal of the Institute of Cost and Management Accountants of Bangladesh*, 35(6), 16-28.
- Pramanik, A.K., Shil, N.C. & Das, B. (2008). Corporate environmental reporting: An emerging issue in the corporate world. *International Journal of Business and Management*, 3(12), 146-154.
- Rafique, M. A., Malik, Q. A., Waheed, A. & Khan, N.-U. (2017). Corporate governance and environmental reporting in Pakistan. *Pakistan Administrative Review*, 1(2), 103-114. <http://nbn-resolving.de/urn:nbn:de:0168-ssoar-53683-7>
- Sani, M.D. (2018). Mandatory social and environmental disclosure: A performance evaluation of listed Nigerian oil and gas companies pre- and post-mandatory disclosure requirements. *Journal of Finance and Accounting*, 6(2), 56-68. DOI: 10.11648/j.jfa.20180602.12
- Shil, N. C., & Iqbal, M. (2005). *Environmental disclosure – A Bangladesh perspective. Online at <http://mpr.aub.uni-muenchen.de/7707/> MPRA Paper No. 7707*
- Sultana, R. (2017). “Application of environmental accounting reporting practices and problems regarding the presentation of it in Bangladesh” (A case study on fossil-fuel sector). *European Scientific Journal*, 13(2), 348-361. DOI: 10.19044/esj.2016.v13n2p348
- Suttipun, M. & Stanton, P. (2012). Determinants of Environmental Disclosure in Thai Corporate Annual Reports. *International Journal of Accounting and Financial Reporting*, 2(1), 99-115. DOI: 10.5296/ijaf.v2i1.1458
- Trireksani, T. & Djajadikerta, H.G. (2016). Corporate governance and environmental disclosure in the Indonesian mining industry. *Australasian Accounting, Business and Finance Journal*, 10(1), 18-28. DOI:10.14453/aabf.v10i1.3
- Ufere, K.J., Alias, B., Uche, A.G. & Onu, U.J. (2017). The level of environmental disclosure in listed property sector companies. *International Journal of Real Estate Studies*, 22(2), 85-92.
- Ullah, M.H., Hossain, M.M. & Yakub, K.M. (2014). Environmental disclosure practices in annual report of the listed textile industries in Bangladesh. *Global Journal of Business and Management Research*, 14(1)1, 96-108.
- Ullah, M.H., Yakub, K.M. & Hossain, M.M. (2013). Environmental reporting practices in annual report of selected listed companies in Bangladesh. *Research Journal of Finance and Accounting*, 4(7), 45-58. Retrieved from <https://www.iiste.org/Journals/index.php/RJFA/article/view/6272/6636>
- Uwalomwa, U. & Uadiale, O.M. (2011). Corporate social and environmental disclosure in Nigeria: A comparative study of the building material and brewery industry. *International Journal of Business and Management*, 6(2), 258-264. www.ccsenet.org/ijbm
- Welbeck, E.E., Owusu, G.M.Y., Bekoe, R.M. & Kusi, J.A. (2017). Determinants of environmental disclosures of listed firms in Ghana. *International Journal of Corporate Social Responsibility*, (2017) 2:11, 1-12. DOI 10.1186/s40991-017-0023-y
- Yusoff, H., Othman, R. & Yatim, N. (2013). Environmental reporting practices in Malaysia and Australia. *The Journal of Applied Business Research*, 29(6), 1717-1726.