

Environmental Accounting Reporting Disclosure and Company Profitability: A Case Study on Listed Manufacturing Companies of Bangladesh

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Abstract

Triple bottom line reporting advocates organizations to provide environmental disclosures and to promote environmental concern in their annual reports as part of sustainable reporting. This paper endeavors to observe the relationship of company profitability and extent of environmental accounting reporting disclosures in the annual reports. For this exploratory research, only secondary data sources were used. All the listed manufacturing companies in DSE are taken as the sample of the study. For this research, an Environmental Accounting Reporting Disclosure Index (EARDI) is developed consisting of 21 major environmental accounting disclosures. Return on Asset (ROA) is used as the proxy variable for company profitability. To obtain the EARDI score, content analysis is being used and statistical techniques such as frequency, mean, standard deviation, ANNOVA, Bi-variate regression model analysis has conducted to acquire research findings. The research paper discloses that only 41 of 166 companies are providing some sort of environmental disclosures in their annual reports and there is a significant positive relation between company profitability and EARDI.

Key Words: *Environmental Accounting Reporting Disclosure, Environmental Accounting, Company Profitability, Manufacturing Companies, DSE.*

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1.0 Introduction

Environmental Accounting refers to the identification, measurement and allocation of environmental costs, environmental financing, environmental assets and liabilities and the integration of these variables into business decisions and subsequent communication of the environmental information with the stakeholders. It can be seen as an environmental management strategy to communicate with stakeholders the environmental activities and the concern for environment by the company. It also aims at achieving sustainable development, maintaining a favorable relationship with the community and pursuing effective and efficient environment conservation activities. These accounting procedures allow company to identify the cost of environmental conservation during the normal course of business, recognize the benefit derived from every activity, provide the best possible ways to quantitative measurement and also help to provide the result to the user of such information. The corporate environmental reporting plays a pivotal role in the “greening” of corporate accountability.

Sustainable development requires that economic development does not cause social and environmental devastation. The pillars of sustainable development are the following: the environment and environmental resources protection, the maintenance of employment and the respect to people’s social needs.

Companies are now becoming more sensitive and aware of their roles and responsibilities towards the society and environment, resulting in a growing trend in social and environmental reporting. Subsequently, researchers have begun to examine the extent of disclosures, including types and nature, form, quality and quantity of information disclosed.

Bangladesh is experiencing a fast degradation of environment. Some examples of this degradation are Dhaka’s terrible air pollution, the ‘clinically dead’ river Buriganga and widespread arsenic pollution in the underground water (Belal, 2000). The Government of Bangladesh started paying attention to the environmental management of Bangladesh since the 1990s and in order to improve the environmental condition, the Bangladesh Environmental Protection Act, 1995 was passed. Presently, corporate environmental reporting is not mandatory in Bangladesh. But under the Bangladesh Environmental Protection Act, 1995, companies may be asked to disclose environmental information as and when required (Belal, 2000). The only mandatory environmental disclosure requirement in Bangladesh is the disclosure of expenditures on energy use. Under Schedule-XI, Part-II of the Companies Act 1994 and under Schedule, Part-II of the Securities and Exchange Rules, 1987, the total amount spent on the use of energy is to be shown in notes to the financial statements under a separate head of expenditure.

2.0 Literature Review

Environmental disclosure emphasizes on the disclosure of the contribution of the organizations in the environmental activities as to attract the investors and as to fulfill the demand of stakeholders groups (Norhasimah et al., 2016). This is supported by Haslinda and Glen (2006) whereby it is the obligation of the business itself in order to inform the stakeholder concerning their environmental engagement as such initiatives could assist the business to portray sustainability business to stakeholders groups (Norhasimah et al., 2016). Environmental accounting research has been traced back to 1997 in Bangladesh. Most of the research is limited to environmental disclosures and content analysis method was predominantly used (Islam, 2015). But unfortunately, the association of company profitability and environmental disclosure is seldom touched.

Numerous quantitative and qualitative studies have investigated the relationship between environmental responsibility and corporate financial performance over the last few decades. Disclosing the environmental information would obtain market benefit as well as the ability to gain profit from investment in environmental improvement. (Perry et al., 2011). Conr and Cohen (2001) found a positive relationship between environmental improvement and the financial performance in US firms. One hundred and twenty-seven US firms were drawn from the Standard & Poor's 500 Index (S&P 500), engaged in the manufacturing, mining or production industries. The change in their emissions efficiency index (emissions per unit of output) for selected pollutants from 1988 to 1989 was regressed against return on sales (ROS), return on assets (ROA) and return on equity (ROE) (Konar and Cohen, 2001).

Roy and Ghosh (2011) examined joint association between economic performance and quality of voluntary disclosure of sustainable environmental practices in an Asian perspective, focusing on 7 Asian countries. The primary research results suggested that they were not simultaneously related. Lankoski (2000) demonstrated an inverted U-shaped association between environmental and financial performance. Cormier and Magnan (2007) argued that nature and level of association between environmental and financial performance highly depends on regulatory reporting environment faced by the company. There are several research studies that showed a positive association of company profitability and performance with environmental disclosure (Fry and Hock, 1976; Rockness, Schlachter, and Rockness, 1986; Freedman and Jaggi, 1992; Roberts, 1992; Deegan & Gordon, 1996; Teoh et al., 1998; Gray et al., 2001; Singh & Joshi, 2009; Pahuja, 2009).

However, later researchers have generally found the association of environmental performance and economic (financial) performance to be statistically insignificant, Freedman and Jaggi (1982) found a statistically insignificant association between environmental disclosure and six accounting ratios used to measure economic performance. Even Shane and Spicer (1983) documented a negative market reaction during the two days preceding the release of CEP environmental reports. Similarly, Stevens (1984) reported that a portfolio of

firms that disclosed higher estimated future pollution-abatement costs experienced monthly returns consistently lower than did a similar portfolio of firms that disclosed lower estimates of future environmental costs. However, Richardson and Welker (2001) found a significantly negative relation between the level of financial disclosure and profitability.

Again, Cowen, Ferreri & Parket 1987; Hackston & Milne, 1996; Ingram and Frazier 1983; Stanny & Ely, 2008; Qiu et al., 2014; found no association between the variables.

Table No – 01: Summary of Related Literatures

<i>Author</i>	<i>Year</i>	<i>Variables Used</i>	<i>Result</i>
Russo and Fouts	1997	ROA	Positive Relation
Konar and Cohen	2001	Intangible Asset Value, Tobin's Q	Positive Correlation
King and Lenox	2001	Tobin's Q	Significant Relationship
Nakao et al.	2007	ROA, ROE, EPS, Tobin's Q	Positive Relationship
Cormier and Magnan	2007	ROA, EPS, DPS	No Relationship
Susi Sarumpaet	2009	ROA, ROE	No Relationship
Mahoney and Roberts	2010	Profit Margin	Significant Relationship
Paul Tiong Nyit Chiong	2011	EPS, ROCE	Negative Relationship
Perry et al	2011	ROA, ROE, and EPS	No Relationship
Adediran, S.A., Alade, S. O.	2013	ROCE and EPS PM and Dividend per share	Negative Relationship Positive Relation
Makori and Jagongo	2013	ROCE and EPS PM and Dividend per share	Negative Relationship Positive Relation
Ong et al.	2014	ROA, ROE	Positive Relation
Norhasimah et al	2016	ROA, ROE, PM	Positive Relation

Source: Developed by Researcher

3.0 Rationale of the Research

Environmental accounting data is not only used by companies or other organizations internally, but is also made public through disclosure in environmental reports. The disclosure of environmental accounting data as one of the key elements in an environmental report enables those parties utilizing this information to get an understanding of the company's stance on environmental conservation and how it specifically deals with environmental issues. At the same time, a more comprehensive grasp of the companies and other organizations' environmental information can be obtained. Stakeholder, institutional and legitimacy theories of accounting advise to adopt environmental reporting in their annual reports.

Organizations are earning profit by operating in the society causing impairment of the environment. With their complex manufacturing process, many organizations are participating in the degradation of the environment. Organizations are taking inputs from the nature and causing worry to the environment. So, it is the role of the organizations to address

those discrepancies to the stakeholders through environment accounting reporting disclosures. This study endeavors to find out the association of company profitability and EARDI.

4.0 Objectives of the Research

The broad objective of this research paper is to find out whether Environmental Accounting Reporting Disclosure practices significantly affect the profitability of the companies in the manufacturing sector of the country.

The other related objectives of the research paper is to.

- To identify the number of companies involved in environmental accounting and reporting practices;
- To observe the position of environmental information in the annual reports of the manufacturing companies;
- To calculate the companies' score on EARDI;
- To determine the correlation between company profitability and EARDI;

5.0 Research Methodology and Design

Research methodologies are the quantitative and systematic procedures and approaches to conduct a research (Saunders *et al*, 2010). It states the data collection and analyzing techniques incorporating a particular research approach, strategy and method (Nachmias, 2009). The research methodologies describe the way in which a particular research is conducted on a particular predetermined topic or subject matter (Daniel & Aroma, 2010).

5.1 Sample Selection

The population of the research is all the manufacturing companies of Bangladesh operating in the country. All the listed manufacturing companies in Dhaka Stock Exchange (DSE) have been selected as the research sample. The sample for the research is as follows-

Table No. 02: Sample Selection

<i>Sector</i>	<i>Number companies listed on the DSE</i>	<i>Number of companies selected as sample</i>	<i>%</i>
Cement	7	7	100%
Ceramic sector	5	5	100%
Engineering	33	33	100%
Food & Allied	18	18	100%
Fuel & Power	18	18	100%
Jute	3	3	100%
Paper & Printing	2	2	100%
Pharmaceuticals & Chemicals	28	28	100%
Tannery Industries	6	6	100%
Textile	46	46	100%
Total	166	166	100%

Source: Developed by Researcher

5.2 Data Sources

The data used in the research is solely of secondary type. The major source of information for the research work is the annual reports of the selected manufacturing companies of Bangladesh for period of 2014-2015. The literature of the research is developed from prior related research work by various researchers.

5.3 Data Collection Method

The data of the report are primarily collected through content analysis technique.

5.4 Data Analysis tools

Data analysis procedures involves with the techniques to analyze the collected data to derive a conclusion by using different statistical tools and techniques to satisfy research aim and objective (Saunders *et al*, 2010). To find conclusion and to analyze the collected data, the researchers have followed several techniques. The researcher used MS excel to prepare the tables, frequencies and percentages of the variables. In addition, the SPSS application was used to analyze the quantitative data. For testing hypotheses, the researcher conducted statistical data analysis through regression model analysis, ANOVA Test and Karl Pearson's correlation. On the other hand, researchers content analysis technique in the annual reports of the companies in order to analyze the score of the companies in Environment Accounting Reporting Disclosure Index (EARDI) consisting of 21 factors which is developed by the researchers.

5.5 Research Hypothesis

H_0 : Environment Accounting Reporting Disclosure (EARD) practices do not affect company profitability.

5.6 Research Model

To test the hypothesis, following bi-variate regression model is being used-

$ROA = a + b_1 EARDI + \epsilon$ Where,

ROA= Return on Asset (Proxy Variable for company Profitability);

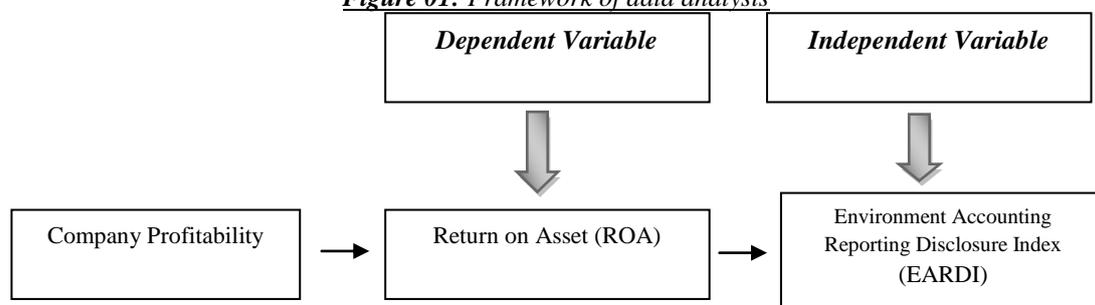
A= Constant;

b_1 = Regression Co-efficient

EARDI= Environment Accounting Reporting Disclosure Index ϵ = Error

5.7 Framework of data analysis

Figure 01: Framework of data analysis



6.0 Research Analysis and Discussion

A total number of 166 corporate annual reports of listed manufacturing companies have been obtained by contacting the company sources. The data year is 2014-2015. All the selected companies are the listed companies of DSE. The sample selection is influenced by the objectives of the study and is constrained by the availability of the reports. The research methods involved an initial scrutiny of recent annual reports to observe the incidence of Environmental Accounting Reporting Disclosure (EARD). The companies making environmental disclosures were carefully examined and analyzed. For this purpose, all sections of the annual report were carefully examined to note the presence of any environmental disclosures. Given the time and resource constraints, the nature of the study tends to be mainly exploratory and descriptive.

6.1 Content Analysis Result

This research is mainly grounded in the content analysis of the firm's annual reports and standalone corporate social and environmental reports or sustainability reports in the company's website yearly.

Table No. 03: Environmental Disclosure by the Listed Companies in 2014-15

Sector	Number companies listed on the DSE	Companies making Environmental disclosures	
		Number of companies	%
Cement	7	1	14.29%
Ceramic sector	5	4	80%
Engineering	33	6	18.19%
Food & Allied	18	3	16.67%
Fuel & Power	18	5	27.78%
Jute	3	0	0%
Paper & Printing	2	1	50%
Pharmaceuticals & Chemicals	28	12	42.86%
Tannery Industries	6	1	16.67%
Textile	46	8	17.39%
Total	166	41	24.71%

From the above table, it is evident that the environmental accounting reporting disclosure is not practiced by the organizations on large scale as only 24.71% (41 out of 166) companies provide some form of environmental disclosure. The ceramic sector provide leading amount of environmental disclosures while jute, cement, tannery and textile industry provide minimal amount of disclosure.

Table No. 04: Form of Environmental Disclosures

Quantification categories	No. of companies providing environmental disclosure	Percentage
monetary quantification	0	0%
non-monetary quantification	5	12.2%
Both monetary and non-monetary quantification	7	17.73%
Qualitative (declarative)	29	70.07%
Total	41	100%

Companies found to be providing environmental disclosure mainly in qualitative form where disclosure is provided in declarative form in sentences or in pictures or in graphs. Only 7 companies provide both monetary and non-monetary quantification as they provide disclosure regarding environmental cost, environmental financing, environmental damage quantification, waste quantification, natural recourse conservation, energy saving quantification etc.

Table No. 05: Location of Environmental Disclosures

Locations	No. of reporting companies	Percentage
Company Website		
Vision and mission	3	7.3%
Environmental Policy	7	17.07%
Awards	2	4.88%
Annual Report		
Corporate governance report	4	9.76%
Corporate social responsibility	14	34.15%
Directors' report	10	24.39%
Chairpersons' report	7	17.07%
Financial Statements	7	17.07%
Separate section of annual report	5	12.19%

From the research it was found that most of the environmental accounting reporting disclosure was found in corporate social report (CSR). Only 7 companies have separate environmental policy which they have disclosed in their corporate website. Management show their concern regarding the environment stating the facts in the Director's and Chairperson's Report as 10 and 7 companies respectively discloses environmental concerns through these reports.

An Environmental Accounting Reporting Disclosure Index (EARDI) is developed by the researchers for conducting the research consisting of the 21 environmentally related accounting practices. The values are assigned to each one value which fluctuates between zero and one, according to the following criterion: the value of one is assigned if the analyzed entity has developed the practice in question and vice versa. Thus, calculation of the value of the Environmental Accounting Reporting Disclosure Index (EARDI) of each entity as the ratio of the computed total score (which can range from zero to twenty one) to the maximum number of points that it is possible to obtain (which corresponds to the total expected number of practices to be developed by the entities, that is, the 21 practices included in the checklist), according to the following expression:

$$EARDI_i = \sum C_j / C$$

Where

EARDI_i =Environmental Accounting Reporting Disclosure Index of Entity i

C_j = Environmental accounting practice j. Dummy variable, whose value is 1 if the entity develops that practice and 0 if the entity does not develop it

C = Maximum number of environmental accounting practices (21)

Obviously, this index cannot be considered representative of all the accounting procedures that can be developed by an entity in order to elaborate and disclose environmental information. However, it constitutes a good indicator of the extent to which the sample's entities have developed environmental accounting practices.

Table No. 06: EARDI Score

<i>Score</i>	<i>No. of Companies</i>	<i>%</i>
100%	0	0%
90%-99%	1	2.48%
80%-89%	2	4.8%
70%-79%	4	9.75%
60%-69%	7	17.07%
50%-59%	5	12.1%
40%-49%	6	14.63%
30%-39%	5	12.1%
20%-29%	7	17.07%
10%-19%	3	7.31%
0%-9%	1	2.48%

The research shows, only 7 companies score more than 70% in EARDI, 18 companies' score in the mid-range of 40%-60% and 16 companies score in the low range.

6.2 Model Summary and Analysis:

Table No. 07: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
ROA	41	.03	.25	.1264	.06094	.004
EARDI	41	.08	.92	.4801	.21011	.044
Valid N (list wise)	41					

ROA shows average result of 12.64% with a lower standard deviation which is 6.094% that implies less volatility among the companies. Conversely, EARDI score shows a mean value of 0.4801 which is moderate with a relatively high standard deviation of 21.01% that entails higher volatility in reporting by the companies (ranging from 8% to 92%).

6.3 Reliability Test

Reliability test deals with identifying the consistency and stability of the variables or factors that were undertaken for the analysis of a given situation and which illustrate similar results in the given environment. It states that the measurement and result of variables will remain consistent across different time frames using different instrument (Sekaran, 2000). The ideal measure of reliability is cronbach's alpha which reflects the multipoint scaled items (Cheah, 2009). The recommended value for cronbach's alpha is 0.50 (Nunnally, 1970) or 0.60 (Moss et al, 1998). But, most researchers take 0.70 to be the ideal value of cronbach's alpha.

<i>Table No. 07: Reliability Statistics</i>	
Cronbach's Alpha	N of Items
.677	2

The overall mean value of the test is 0.677 which is little lower than 0.70 but higher than .60. The individual value of the factors are higher than 0.60 except satisfaction level. So, the degree of reliability of the factors taken for the study is moderately high.

Table No. 08: Correlations

		ROA	EARDI
ROA	Pearson Correlation	1	.558**
	Sig. (2-tailed)		.000
	N	41	41
EARDI	Pearson Correlation	.558**	1
	Sig. (2-tailed)	.000	
	N	41	41

Table No. 08: Correlations

		ROA	EARDI
ROA	Pearson Correlation	1	.558**
	Sig. (2-tailed)		.000
	N	41	41
EARDI	Pearson Correlation	.558**	1
	Sig. (2-tailed)	.000	
	N	41	41

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation determines the degree of relationship between variables. The result of the research shows a correlation value of 0.558 between ROA and EARDI. So, there lies a moderate positive correlation between the research variables.

Table No. 09: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.558 ^a	.474	.463	.04027

a. Predictors: (Constant), EARDI

The result of goodness of fit shows R-Square and adjusted R- Square value of 0.474 and 0.463 which indicates 47.4% variability of ROA can be described by EARDI.

Table No. 10: ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	.085	1	.085	52.586	.000 ^a
Residual	.063	39	.002		
Total	.149	40			

a. Predictors: (Constant), EARDI

b. Dependent Variable: ROA

From the above table it can be inferred that the p value 0.000 is lower than the significance level of 0.05 adopted for the test. So, it can be inferred that the null hypothesis in this case cannot be accepted. Therefore, it can be concluded that the Environmental Accounting Reporting Disclosure positively impact the profitability of the companies.

Table No. 11: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.021	.016		1.316	.196
	EARDI	.220	.030	.758	7.252	.000

a. Dependent Variable: ROA

The research table shows that if the EARDI increases by 1 unit ROA will increase by .220 units. EARDI contributes significantly to the regression model because the value of p is .000 which is less than $\alpha = .05$ that also was proved by the significance value of ANOVA table. So, the null hypothesis cannot be accepted and it can be articulated that EARDI significantly affect the profitability of the companies.

7.0 Conclusion and Recommendations

Environmental accounting practices are still in the elementary stage as the research shows only 41 companies out of 166 companies making some sort of environmental disclosures in their annual reports. Since the environmental reporting significantly affect company profitability as the research findings show, and stakeholder, institutional and legitimacy theory supports for environmental reporting in the annual reports, companies should try to strengthen their position on environmental accounting practices. The practice can be developed if :

- Government and authoritative bodies should compel the manufacturing organizations to disclose environmental information in their annual reports.
- Incentives can be given to the organizations that follow environmental laws and regulations and provide environmental information in their annual reports in order to promote the practice.

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Appendix A: Environmental Accounting Reporting Disclosure

Sl. No.	Environmental Accounting Reporting Disclosure
1.	Environment Policy
2.	Management concern for Environment
3.	Environment Management System
4.	Environmental Risk management
5.	ISO 14001 Certification
6.	Environmental Cost identification and recording
7.	Environmental Financing
8.	Environmental Audit
9.	Waste Management
10.	Effluent Treatment Plant (ETP)
11.	Carbon Emission Report
12.	Energy Policies
13.	Spills, Noises and Odor
14.	Raw Material Conservation
15.	Natural Resource Conservation
16.	Innovation and Ways to reduce Environmental Degradation
17.	Recycling of Waste products
18.	Pollution
19.	Environmental Research and Development
20.	Environmental Compliance
21.	Other Environmental Issues