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Renewable Energy, Sustainability and Environment: Are We There Yet?

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Unlimited access to energy sources is essential for any economic development; this is specially factual for a developing country like Bangladesh. Most developing countries have ample renewable energy resources. By developing such energy sources developing countries can reduce their dependence on oil and natural gas, creating energy portfolios that are easily available and less vulnerable to price rises. This paper first presents an empirical investigation on sustainability and environmental disclosure by all the listed companies in Bangladesh; followed by highlight different potential renewable energy sources and probable challenges. Analysis of annual reports published in 2007-2008 reveals that only about 10 per cent of listed companies made sustainability and environmental disclosures, however none of them disclosed any use of renewable energy sources. There are still opportunities to improve the current practice. To alleviate shortage of energy recourses and to ensure uninterrupted production this is the right time for companies to adapt renewable energy sources like solar energy, wind power, biomass and biogas and hydro energy.

Field of Research: Renewable Energy, Sustainability, Environment, Bangladesh

1. Introduction

As a developing country, Bangladesh is facing intimidating energy challenges that are merely likely to worsen over the next few years. Listed companies, due to their size of operation, contribute to this challenge of energy demands. This exploratory study investigates, first, the extent of sustainability and environmental discloser by listed companies in Bangladesh and second, way to improve it by use of renewable energy sources. Previous researches in this area are mostly focused on developed countries (Adams and Harte, 1998a and Adams, Hill and Roberts, 1998b; Ernst and Ernst, 1978; Gray, Javad and Power, 2001, Gray, Kouhy and Lavers, 1995a, 1995b; Guthrie and Parker, 1990; Mathews, 1993; Roberts, 1992). Little attention has been given to the practices in developing countries (Belal and Owen, 2007). Due to the availability of cheap labour, Bangladesh has become attractive destinations for global investors. However, before making investment decisions many investors are concerned with continuous supply of the energy sources which is vital for any business. As there is limited availability of electricity and natural gas, companies can consider the use of renewable energy sources.

Over the last few years interest has grown in renewable energy, especially in the wake of global awareness of greenhouse gas emissions. Most researchers argued that failure to reduce human induced greenhouse gas emissions will result in significant increases in global atmospheric temperatures which could disrupt people's

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living conditions. It demands immediate attention, specially in Third World countries, where natural resources are being used up at an incredible rate to feed growing populations and economies. Natural resources are being depleted at a rate quicker than they can recover and it is now time to consider potentially renewable resources. No matter what we do to foreign investors - this will not extensively happen until we ensure an uninterrupted supply of electricity to developing nations.

United Nations and World Energy Organization figures estimate that there are still 1.4 billion people without access to clean and affordable electricity services in developing countries. The “new” renewable energies, such as wind energy, solar energy, geothermal energy, modern biomass, small hydropower and ocean energy, have a much smaller impact on the environment however; can contribute to a truly sustainable development. Regretfully, over 85% of the energy produced from “new” renewable energy takes place in industrialised countries. This is a somewhat paradoxical situation, considering that developing countries have a much larger potential than industrialised countries for renewable like wind and solar energy.

This paper is structured as follows: first, a brief overview of the leading literatures followed by current scenario in Bangladesh in Section 2. Section 3 discusses methodology and data collection. Findings based on content analysis is discussed in Section 4. Potential energy source barriers are discussed in Section 5. Concluding remarks are presented in Section 6.

2. Literature Review

Since the 1980s, sustainability and environmental responsibility attracted considerable academic research (Deegan, 2002; Gray, 2002; Mathews, 1995). Research on voluntary disclosure has attempted to examine the nature and patterns of sustainability and environmental disclosure and investigates the determinants of these disclosure such as size, profit, and industry affiliation (Cormier and Magnan, 2003). The literature recognizes that sustainability and environmental practices across countries (Adams et al., 1998b) and between developed and developing countries (Imam, 2000). Further, the nature and patterns of sustainability and environmental disclosure vary between industry sectors (Gray et al., 2001). Surveys of sustainability and environmental disclosure practices in western developed countries reveal that companies place the greatest emphasis on human resources disclosures (Gray et al., 2001) such as employee numbers and remuneration, equal opportunities, employee share ownership, disability policies, and employee training. Moreover, the vast majority of disclosures are qualitative in nature.

In a study of 150 companies in the US, UK and Australia Guthrie and Parker (1990) found that 85% of US, 98% of UK, and 56% of Australian companies made some social disclosures in their annual reports. This study indicated that more than 40% of these companies reported human resource issues, 31% reported community involvement, 13% reported environmental activities, and 7% reported energy and product related issues. It also revealed the average number of pages that organizations in these countries allotted for social disclosures. Companies in the US used 1.26 pages while 0.89 and .70 pages were used in the UK and Australia respectively.

However, it would be inappropriate to generalize the results of studies of developed nations to newly developed countries because the stage of economic development is likely to be an important factor affecting sustainability and environmental disclosure practices. In the context of emerging economies, a few studies have focused on companies in countries such as Malaysia, Singapore, and Hong Kong. For example, a study of 100 public companies in Malaysia showed that 66% of the companies made some kind of social reporting (Kin, 1990). Of these, 64 companies reported human resource issues and 22 companies disclosed community involvement issues. A similar study in Hong Kong revealed that 6% companies disclosed social activities with an emphasis on staff development and community relations (Lynn, 1992). The number of pages dedicated to such disclosures ranged from 0.25 to 3 pages. Ng (2000) found that 9% of the 200 HK listed companies reported environmental information in published accounts. However, no company disclosed financial data concerning environmental performance. Disclosures appeared in the directors' report or the chairman's statement. Such disclosures were general statements indicating company support for environmental protection and describing projects to reduce pollution and save energy and resources.

There are multiple theoretical reasons why the companies should do sustanibility reporting, some companies' still not doing this because of not having that information; it signals bad performance; or because of the expense. However, worldwide there is an increasing trend of sustainability and environmental reporting. An international survey of corporate sustainability reporting conducted by KPMG in 2008 found that 70 per cent of the world's 250 largest companies issued separate reports on sustainability and environmental responsibility in 2008 compare to their finding of 52 per cent in 2005. At national level, the two top countries in terms of separate sustainability and environmental reporting are Japan (88% in 2008; 80% in 2005) and the United Kingdom (84% in 2008; 71% in 2005). There were 8 and 13 percentage point increases in stand-alone reports in Japan and UK respectively in last 3 years. This escalation signals the significance of sustainability and environmental disclosure (KPMG, 2008). However, South East Asian countries such as India, Pakistan, and China are still low in these practices.

Nevertheless, there is a change in the way companies report sustainability and environmental practices. From using a section in the annual report, companies are now moving to stand-alone reports (KPMG, 2008). Global Reporting Initiative (GRI) have elaborated guidelines for preparing social or sustainability reports. Many companies use this guideline as a framework to build their social reports (Raman, 2006).

As expectations for disclosure of information on environmental and social performance have grown, so have demands for information in a standardized way that allow readers to compare company performance. A number of broadly recognized standards are particularly relevant to sustainability and environmental disclosure including the GRI Sustainability Reporting Guidelines, Accountability Assurance Standard 1000 & 1000S, and the ISO 14001 Series. The GRI Guidelines focus on issues that should be reported (Maitland 2002a,b). GRI develops these reporting guidelines using a global consensus-seeking process that involves reporting organisations such as companies, as well as report readers and users like employees, investors, and non-governmental organisations. GRI issues its first set of

guideline in 2000, the second in 2002 (known as G2 guideline) and the third in late 2006 (G3 Guideline) (KPMG, 2008); AAS 1000 & 1000S focus on the processes of reporting and auditing. A focus on processes, and, in particular, the involvement of stakeholders through a robust process of dialogue, is likely to result in a company properly discharging accountability rather than simply complying with a list of disclosure items (Adams, 2004).

Current Scenario in Bangladesh

Bangladesh, which has a population of 162.20 million, is one of the world's most densely populated nations (Matabadal, 2011). The country is situated in the north-eastern parts of south Asia, with a land area of 147,570 km^2 (around 1099 people/km^2). Bangladesh is one of the least urbanized nations in that 72% of its people live in rural areas. It is also one of the world's poorest nations with a Gross Domestic Product (GDP) per capita of US $1,700 in 2010; average annual growth of GDP is expected to be 6% this year (CIA, 2011). Bangladesh has experienced a severe power crisis for nearly a decade (Mondal, 2010). However, as we know energy, and more explicitly electricity, is a prerequisite for technological development, higher economic growth and higher foreign investment. Its future economic development is likely to result in a rapid growth in the demand for energy with accompanying shortages and problems.

Renewable energy and its different energy conversion technologies can be economically viable for listed companies. Although investment costs of renewables are generally higher compared to fossil fuel alternatives, this option becomes economically viable when all externalities, e.g. environmental cost, health hazards, etc. and lower operating costs are taken into consideration (Khan, Iqbal & Mahboob, 2004). The government of Bangladesh has not imposed or proposed requirements for disclosure of social and environmental performance. In Bangladesh, sustainability and environmental reporting is still voluntary with the exception of disclosure of expenditures on energy usage required under the Companies Act of 1994 and the Securities and Exchange Rules of 1987 which require that the total amount spent on energy be shown as a separate expenditure in the notes to the financial statements (Belal, 2001).

There have been previous studies in Bangladesh in the area of extent of sustainability and environmental reporting; however none of them suggested renewable energy as a way forward. As an example, Imam (2000) takes a sample of 40 listed companies (out of 207 listed companies in the years 1996–1997), Hossain, Islam and Andrew (2006) uses a sample of 150 companies for the year 2002–2003; and Belal (2000) samples 30 companies (from both private and public sector) and examine sustainability and environmental reporting practice.

Using annual reports of 40 listed companies of DSE, Imam found that in 1996 – 97 annual report

> " *….. a total of 25 per cent of the sample companies made community and 22.5 per cent sustainability disclosure. Only 10 percent of companies provide consumer related disclosure*" (Imam, 2000, p. 136)

Though some progressive companies disclosed some information on community, environmental and consumer related disclosure, that information was not at all adequate in discharging social responsibilities. Imam conclude that

> " *….. the sample listed companies tend to represent a relatively minor quantity of disclosure when compared with corporate financial disclosures. The disclosures mostly comprise narrative qualitative information*."
>
> (Imam, 2000, p. 140)

Also using annual reports, of 107 non-financial companies, for the financial year 2002–2003, Hossain et al., showed that

> "……*an average 8.33% of Bangladeshi companies disclose social and environmental information in their corporate annual report"*
>
> (Hossain et al., 2006, p. 10)

Hossain et al (2006) conclude that these disclosures were voluntary in nature and largely qualitative. They also mentioned that if we compare the findings with the developed and some developing countries, the disclosure of social and environmental information made by the listed companies in their corporate annual reports in Bangladesh is "*very disappointing*" (Hossain et al., 2006).

Belal (2001) study represents 30 annual reports collected on an ad hoc basis directly by contracting the company source or collected from Dhaka Stock Exchange. In this study listed companies dominate the survey (28 out of 30) representing 15 percent of the total listed companies in Bangladesh (196 as at June, 1997). Belal (2001) concluded that

> *"…although a number of companies are making social disclosures, the quality of information disclosued is very low. The nature of disclosure is mainly descriptive"* (Belal, 2001, p.286)

These conclusions are similar to that of Imam (2000). In the absence of independent verification, the credibility of information disclosed is questionable.

3. Methodology

Annual reports, in general, are considered appropriate documents for studying sustainability and environmental disclosures as they are common and popular means of communication to stakeholders and command credibility (Guthrie and Parker, 1990; Singh and Ahuja, 1983; Adams, 2004; Gray et al., 1995a, 1995b; Raman, 2006). As this is argument is also valid in Bangladesh, to analyze the extent of sustainability and environmental reporting by Bangladesh companies, annual reports were used as a primary sources document. Separate corporate sustainability and environmental disclosure reports by public listed limited companies published between 1 July 2007 and 30 June 2008 were also reviewed. Taking 2007 - 2008 as the target year, 263 companies were listed on the Dhaka Stock Exchange (DSE). The unavailability of 17 reports reduced this number to 246. This represents 93.53% of listed companies.

According to the findings, 25 companies or 10.16% of companies made disclosures relating to corporate sustainability and environmental performance. Therefore, 221 companies or 89.83% of companies made no information available in their annual report. These 25 reporting companies were systematically analyzed using the technique of content analysis. This technique is defined 'as a method of copying the text (or content) of a piece of written work into various categories on the basis of selection criteria' (Krippendorf, 1980, p. 21). This technique has been used in other studies (Guthrie and Parker, 1990; Raman, 2006). Content analysis employs a three - step process (Raman, 2006). First, an appropriate document is chosen. For this study, Director's report, Chairman's report, Separate section of annual report and separate sustainability reports were chosen.

The second step is to determine the unit for measuring contents. Different researchers use different units of measure. For example, Zeghal and Ahmed (1990) used the number of words, Hackston and Milne (1996) the number of sentences, and Gray et al., (1995b) the number of pages. Indeed there has been considerable debate about these different measures (Gray et al., 1995; Milne and Adler, 1999; Unerman, 2000). For example, in the case of pages, some researchers do not consider font size, line spacing, and page margins. Others argue that words would have no meaning unless they are part of a sentence. Raman (2006) argues that pages are a preferable measure since they can be easily counted and involve less judgment. Thus, in this study the unit of measure is number of pages. As different companies use different measurement size, line spacing, and page margins, to be consistent we typed them in a different word file and measure the portion of pages use by them. Previous sustainability and environmental researches (such as, Imam, 2000; Belal, 2000, 2001; Hossain et al., 2006) did not take this fact into consideration.

The third step of content analysis involves identification of themes or categories into which blocks of content can be classified. The earlier work of Ernst and Ernst (1978), Guthrie and Parker (1990), and Gray et al., (1995a) is used to categorize information into four dimensions: Theme, Form, Amount and Location. Theme was based on categories such as environment and energy. The form of disclosure includes quantified data, either monetary or non-monetary, and qualitative or declarative data. Amount measures the proportion of pages devoted to sustainability and environmental responsibility issues. Location refers to directors' report, Chairman's report, Separate section of annual report and separate or stand alone report.

The relevant 25 annual reports from DSE are examined to identify the type and extent of disclosures in relation to corporate sustainability and environmental disclosure.

4. Empirical Findings Based on Content Analysis

For the purpose of this study, a corporate sustainability and environmental responsibility worksheet was constructed with the headings of them of disclosure, quantification of CSR disclosures, location of disclosure and renewable energy disclosure (see Appendix). Till now none of the listed companies implemented GRI G3 disclosure in their annual report. Therefore, it becomes extremely difficult to prepare the corporate sustainability and environmental responsibility worksheet

according to a standard breakdown such as GRI performance indicators or Global Compact principles. Again, lack of a widely accepted definition of 'sustainability and environmental responsibility' set a limitation on this exercise and allows for the possibility of multiple interpretations. Probably the most well-known studies in this area are by Ernst and Ernst between (1978); Guthrie and Parker (1990), and Gray et al., (1995a). The Ernst and Ernst's analysis of annual reports of Fortune 500 companies revealed specific indicators of different categories of sustainability and environmental involvement. Attempting to reduce the degree of subjectivity and bias, Ernst and Ernst (1978) claimed, "If anything, the amount of disclosure reported in the survey is understated because of the selective approach employed in identifying and categorizing disclosures and the possibility of human error".

The findings from Industry-wide analyses revealed two industries, Banking, Energy and Pharmaceuticals and Chemicals are ranked highest in terms of the percentage of companies making corporate sustainability and environmental disclosures Companies in Ceramic, Engineering, IT, Jute, Paper and Printing Services, Real Estate, and Textiles - made no corporate sustainability and environmental disclosures. The top themes of corporate sustainability and environmental responsibility disclosure in annual reports is prevention or repair of environmental damage. Only one company (BATBC) disclose conservation of natural resources.

The most popular place for locating sustainability and environmental responsibility disclosures are the Director's report (57.89%), 18.43% used a specific section of the annual report, and 13.16% used the Chairman's Report. Only two companies (Bank Asia and British American Tobacco Bangladesh Company Ltd.) issued separate booklets.

The mean amount of disclosure was in between quarter of a page – half page, with 65.79% of companies disclosing less than quarter of a page, and 13% disclosing more than one page. To be consistent for comparison reason we typed all the sustainability and environmental disclosure sections from the annual report into a separate word file and use A4 format, 12pt Times New Roman, margins: top -2.5 cm, bottom, left and right - 2 cm each. Given this standard paper sizes, the measure of 'pages' attributed to a particular form of disclosure can be expected to remain reasonably constant among observers.

None of the listed companies disclosed information on use of renewable energy sources. However, this could a potential avenue for the listed companies and also this sustainable vision would be highly appreciated by the foreign investors. Next sessions will discuss the prospect of different renewable energy sources and potential problem of their use.

5. Potential Energy Source and Challenges for Companies

5.1 Prospect of Renewable Energy

Bangladesh has very limited non-renewable energy resources of its own. She is facing energy crisis and serious desertification problem. These issues could be removed if renewable energy is used as a primary source of energy. It is essential to discuss the prospect of renewable energy resources and effective technologies.

Prospect of Solar Energy

The energy from sunlight reaching the earth is a huge potential that can be exploited and used for generating electricity. Of the number of available technologies, solar photovoltaic (PV) is the most promising. PV technology converts sunlight into direct current (DC) electricity. The major issue facing PV technology is cost, however listed companies in stock exchange can afford this as they have long term vision. Solar PV is becoming more and more popular due to high modularity, no requirement for additional resources, no moving parts, and only low maintenance is needed Over the last two decades, the cost of manufacturing and installing solar PV systems has decreased by about 20% for every doubling of installed capacity (Brown & Hendry, 2009). In developed countries, solar industry has grown at a rate of 35% per year over the last ten years (British Petroleum website, 2011).

Bangladesh is located between 20.30 - 26.38 degrees north latitude and 88.04 - 92.44 degrees east, which is an ideal location for using solar energy. Here, the daily average solar radiation varies between 4 to 6.5 kWh per square meter (Azad, 2011). This is positive for companies as they have large factory building and the solar panel can be set at roof. In Bangladesh, a maximum amount of radiation is available during the months of March and April while the minimum amount is available during December and January.

Prospect of Wind Energy

Many of the listed companies has factory building in the coastal areas (i.e., Cement companies). The energy from continuously blowing wind can be captured using wind turbines that convert kinetic energy from wind into mechanical energy and then into electrical energy. Electricity generated by wind turbines can be fed to the central grid or be locally consumed using small stand-alone wind turbines. Gradually, generation of electricity from wind energy is proving to be very promising where speed and wind power density is sufficiently high (Mondal, 2010).

Prospect of Biomass and Biogas

Worldwide, biomass provides basic energy requirements for rural households' cooking and heating in developing countries. Biomass covers all kinds of organic matter from fuel wood to marine vegetation. Energy generation using biomass offers a promising solution to environmental problems by reducing the emission of common greenhouse gases. Several technologies exist for converting biomass into energy such as heat energy and electrical energy. Biomass is the most significant energy source in Bangladesh which accounts for 70% of the total final energy consumption (Azad, 2011). This technology can be disseminated on a larger scale for generating electricity.

Prospect of Hydro Energy

Kinetic energy from flowing or falling water is exploited in hydropower plants to generate electricity. In Bangladesh about 1.4 trillion cubic meters (m^3) of water flows through the country in an average year. The country's major rivers have a high rate of water flow lasting for approximately 5 to 6 months during the monsoon season, which is substantially reduced in the winter season. More than 90% of Bangladesh's rivers originate outside the country, due to which proper planning of water resources is difficult without neighbouring countries' cooperation (Azad, 2011).

5.2 Barriers to Renewable Energy

There are several barriers to using renewable energy in a developing country like Bangladesh. These include cost-effectiveness, technical problems and market barriers. Some issues may be specific to a technology, while some may be specific to a country or a region. Three broad categories of barriers are discussed in this section.

Costs and Pricing Barriers

It is commonly argued that renewable energy in Bangladesh is more expensive than other energy sources, resulting in cost-driven decisions and policies that avoid renewable energy. However, a true comparison must be made on the basis of total "lifecycle" costs. Lifecycle costs account for initial capital costs, future fuel costs, future operation and maintenance costs, decommissioning costs, and equipment lifetime. A variety of factors can distort this comparison. For example, government subsidies to the listed companies may lower the costs of competing fuels. Although it is true that initial capital costs for renewable energy technologies are often higher on a cost-per-unit basis, existing analytical tools for calculating and comparing costs can discriminate against renewable energy if they do not account for future uncertainties or make unrealistic assumptions. Many policies attempt to compensate for cost-related problems by providing additional subsidies for renewable energy in the form of tax credits or incentives. This means establishing special pricing rules and lowering transaction costs. Despite many calls for reducing subsidies for fossil fuels and nuclear power, in practice this is politically difficult. Thus practical policies have tended to focus on increasing subsidies for renewable energy rather than reducing subsidies for fossil fuels and nuclear power.

Even though lower fuel and operating costs may make renewable energy cost-competitive on a life-cycle basis, higher initial capital costs can mean that renewable energy provides less installed capacity per initial dollar invested than conventional energy sources. Consequently, renewable energy investments generally require higher amounts of financing for the same capacity. Depending on the circumstances in Bangladesh, capital markets may demand a premium in lending rates for financing renewable energy projects because more capital is being risked up front than in conventional energy projects. Renewable energy technologies may also be subject to high taxes and import duties. These duties may exacerbate the high first-cost considerations relative to other technologies and fuels (Beck & Martinot, 2011).

Legal and Regulatory Barriers

In the absence of a power supply-related specific legal framework in Bangladesh, independent power producers may not be able to invest in renewable energy facilities and sell power to the utility or to third parties under "power purchase agreements." Similarly, utilities may negotiate power purchase agreements on an individual *ad hoc* basis, making it difficult for project developers to plan and finance companies on the basis of known and consistent rules. In many countries, power utilities still enjoy a monopoly on electricity production and distribution. Investors are more attracted to those countries.

Wind turbines have faced specific environmental concerns related to siting along migratory bird paths and coastal areas. Wind turbines, rooftop solar hot-water heaters, photovoltaic installations, and biomass combustion facilities may all face

building restrictions based on height, aesthetics, noise, or safety, particularly in urban areas. City corporations' (i.e. Dhaka, Chittagong, Rajshahi, etc) or Rajdhani Unnayan Kartripakkha (RAJUK) building inspectors may be unfamiliar with renewable energy technologies and may not have established procedures for dealing with siting and permitting. Competition for land use with agricultural, recreational, scenic, or development interests can also occur.

Utilities may not allow favourable transmission access to renewable energy producers, or may charge high prices for transmission access. Transmission access is necessary because some renewable energy resources like windy sites and biomass fuels may be located far from population centres. Transmission or distribution access is also necessary for direct third-party sales between the renewable energy producer and a final consumer (Beck & Martinot, 2011).

Market Performance Barriers

Consumers or project developers may lack access to credit facilities. They cann't purchase renewable energy because there lack of collateral, poor creditworthiness, or distorted capital markets. In rural areas, "micro credit" lending for household-scale renewable energy systems may not exist. Available loan terms may be too short relative to the equipment or investment lifetime. In Bangladesh it is difficult to obtain bank financing due to the level of uncertainty regarding the success of a project.

Proven, cost-effective technologies may still be perceived as risky if there is little experience with them in a new application or region. The lack of visible installations and familiarity with renewable energy technologies can lead to perceptions of greater technical risk than for conventional energy sources (Beck & Martinot, 2011). These perceptions may increase required rates of return, result in less capital being available, or place more stringent requirements on technology selection and resource assessment. Finally, prejudice may exist due to poor past performance that is out of step with current performance norms or expectations.

6. Conclusion

In conclusion, number of companies making sustainability and environmental disclosure is relatively small. Those companies who make these disclosures, the quantity of disclosure is very low. Most corporate sustainability and environmental disclosures are qualitative in nature. These conclusions are similar to Imam (2000) and Belal (2001). Again there is no independent verification of the information, so the credibility of the information is questionable. Three quarters of disclosures are generalized qualitative statements without any attempt to convert this qualitative information into quantitative terms; more than half of sustainability and environmental disclosure is located in the Director's report; and the mean amount of disclosures is less than half a page. Industry-wide analysis reveals that companies in the Banking, Energy and Pharmaceuticals & Chemicals sectors rank highest in terms of disclosures. At a national level there is a high level of disclosure in both sectors. However, it is not clear why companies in other sector like Ceramic; Engineering, IT, Jute, Paper and Printing, Service, Real Estate, and Textile industries do not disclose sustainability and environmental information. This situation calls for further research to discover the causes of such variation. As explained in Belal (2001) the phenomenon of non-disclosure of sustainability and environmental disclosure may be

attributed to the socio-economic-political factors in Bangladesh. Given the presence of widespread corruption, unstable political situation, deteriorating law and other situation and the influence of social elite, non-compliance to the legal requirements often encourage companies to not/poor disclosure of sustainability and environmental commitments.

Again, developing countries, where access to energy is still not available for large populations, may provide vast potential for the growth in renewable energy sources. Efforts are being made in developing to increase the share of renewable energy due to environmental and sustainability considerations in energy usage, and to take advantage of the growing renewable energy market. The major sources of renewable energy in Bangladesh include solar, wind energy, biomass and biogas, and hydro. Other minor renewable energy sources are bio-fuels, gasohol, geothermal, river current, wave and tidal energy. The potentialities of these minor sources are yet to be explored.

This paper also discussed some of the barriers or problems facing renewable energy. However, several barriers, which may vary across countries, impede the penetration of renewable energy techniques into developing countries. These barriers need to be identified and overcome before this potential can be realised. Appropriate integration of renewable energy technologies is important not only for sustainable development of the country but it is also the responsibility of Bangladesh to contribute to the global common task of protecting the environment from pollution.

In future, measures to overcome the barriers should be carried out using survey, site visits and interaction with important stakeholders. These stakeholders include consumers, NGOs, experts, policy makers, and professional associations. The responses from stakeholders can be obtained through structured interviews or questionnaires. It is important that all the relevant barriers are considered and their dimensions are revealed during interactions with stakeholders. Stakeholders' views on strategies to overcome such barriers should also be obtained so that policy-making and decision-making are effective.

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Appendix - Renewable Energy, Sustainability and Environment

Category	Them of Disclosure							Quantification of CSR Disclosures				Location of Disclosure	Renewable Energy Disclosure
	Pollution control	Prevention or repair of environmental damage	Conservation of natural resources	Other environmental disclosures	Conservation	Energy efficiency of products	Other energy-related disclosures	Both monetary and non-monetary quantification	Monetary	Non-monetary	Qualitative (Declarative)		
AB Bank	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
Alltex Ind. Ltd.	x	✓	x	x	x	x	x	x	x	x	✓	CR	x
Anlima Yarn	x	✓	x	x	x	x	x	x	x	x	✓	CR	x
Aramit	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
Bank Asia Ltd.	x	✓	x	x	x	x	x	✓	x	x	x	DR & separate booklet	x
BATBC	x	✓	✓	x	x	x	x	✓	x	x	x	Separate booklet/ other section	x
Beximco Pharma	x	✓	x	x	x	x	x	x	x	x	✓	Other section	x
BOC Bangladesh	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
BRAC Bank Ltd.	x	✓	x	x	x	x	x	x	x	✓	x	Separate section	x
Dutch-Bangla Bank	x	✓	x	x	x	x	x	✓	x	x	x	Other section	x
Eastern Bank	x	✓	x	x	x	x	x	x	x	x	✓		x
Glaxo SmithKline	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
Heidelberg Cement Bd.	x	✓	x	x	x	x	x	x	x	x	✓	CR	x
IDLC	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
Islami Bank	x	✓	x	x	x	x	x	x	x	✓		DR	x
Kohinoor Chemicals	x	✓	x	x	x	x	x	x	x	x	✓	CR	x
Lafarge Surma Cement Ltd.	x	✓	x	x	x	x	x	x	x	x	✓	CR	x
Libra Infusions Limited	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
Mercantile Bank Ltd.	x	✓	x	x	x	x	x	x	x	x	✓	Other section	x
Orion Infusion	x	✓	x	x	x	x	x	x	x	x	✓	Other section	x
Prime Bank	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
Renata Ltd.	x	✓	x	x	x	x	x	✓	x	x	x	Other section	x
Square Pharmaceuticals	x	✓	x	x	x	x	x	x	x	x	✓	DR	x
Summit Power Limited	x	✓	x	x	x	x	x	x	x	✓	x	DR	x
The Ibn Sina	x	✓	x	x	x	x	x	x	x	x	✓	CR	x