

# Corporate Environmental Reporting for Achieving Environmental Sustainability: Evidence from Real-estate, Engineering, and Automobiles Industry

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**To Link this Article:** http://dx.doi.org/10.6007/IJARAFMS/v13-i2/16615 DOI:10.6007/IJARAFMS /v13-i2/16615

Received: 10 February 2023, Revised: 11 March 2023, Accepted: 29 March 2023

Published Online: 07 April 2023

In-Text Citation: (Uddin et al., 2023)

**To Cite this Article:** Uddin, M. M., Rabbi, M. F., & Parvin, M. H. (2023). Corporate Environmental Reporting for Achieving Environmental Sustainability: Evidence from Real-estate, Engineering, and Automobiles Industry. *International Journal of Academic Research in Accounting Finance and Management Sciences*, 13(2), 1–21.

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Vol. 13, No. 2, 2023, Pg. 1 - 21

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# RESEARCH IN ACCOUNTING, FINANCE AND MANAGEMENT SCIENCES



ISSN: 2225-8329

# Corporate Environmental Reporting for Achieving Environmental Sustainability: Evidence from Realestate, Engineering, and Automobiles Industry

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#### **Abstract**

This study intends to investigate the companies' environmental reporting disclosure practices. To achieve the research aim, we have developed 'Environmental Risk Reporting Practices Index for Engineering Industry (ERRPIEI) which includes environmental, energy, waste, water, biodiversity, and supply chain management and design. Additionally, the 'Environmental Risk Reporting Practices Index for Services and Real Estate (ERRPISE)' has been developed by authors that include strategy and governance toward environmental sustainability, reduction, and optimization initiatives, communicating and joining the collective effort, different metrics, and environmental sustainability Simultaneously, these two indexes are made up of 114 index items. Data is accumulated from 46 companies operating in two different sectors namely engineering (automobile), services, and real estate for the year 2021-2022 from Dhaka Stock Exchange (DSE), Bangladesh. The study revealed that the overall scoring of index items is very petite, with companies providing very insufficient and inappropriate non-financial information, most of the companies scored zero in all our disclosure items. Furthermore, the services, and real estate industry is disclosing more index items on environmental issues than the engineering industry. This study will contribute to the standing literature on highlighting corporate environmental reporting aspects of annual reports as well as providing some insights on the environmental reporting and disclosures to the concerned policy-makers for taking efforts and initiatives for adapting to climate change and securing sustainable development which leads to achieving overall environmental sustainability.

**Keywords:** Environmental Sustainability, Environmental Disclosures, Sustainable Existence and Development

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#### Introduction

Numerous companies are criticized for forming environmental problems such as climate change, depletion of natural resources, and waste production, and for not taking initiatives for corporate environmental responsibility. Yet, a change in increasing public awareness concerning environmental sustainability has been found in a large range of stakeholders (Clarkson et al., 2011). Lately it is believed that, for environmental degradation and crisis, companies are responsible and called to pay for this which is termed a cost-benefit trade (Pramanik et al., 2008). Accordingly, companies are now called for greater accountability for the impact of their decisions and activities on the environment and these developments tend to publish a variety of information on environmental topics in environmental and sustainability reporting (Clarkson et al., 2011). Recent tendencies can be noted in the field of environmental reporting including, imposing legal obligations, arising demand for environmental issues from both primary and secondary stakeholders, and an increasing need of moving to quantified, comparable, verifiable, and verified information (Kolk, 1999). Globally, in order to ensure sustainable development, the responsibilities of companies regarding the impacts of corporate investment decisions and activities are urged to become more responsible by the stakeholders such as corporate investors, and capital providers (Clarkson et al., 2011).

#### **Corporate Environmental Reporting**

The considerable volume of information published by companies regarding environmental issues in different media such as stand-alone environmental reports, triple bottom line reports, sustainability, and annual reports in both forms printed and internet (Van Staden and Hooks, 2007). In today's corporate reporting practice which is considered as it is prepared for stakeholders and stakeholders usually show a keen interest in it, corporate environmental reporting came as a crucial issue. Now it is going to be an important part of the general purpose financial statement as it is a question of life and sustainability (Pramanik et al., 2008). Corporate environmental management systems and standards including environmental policies, environmental guidelines, and charters, environmental auditing, lifecycle assessment, the measurement of environmental performance, and environmental reporting present a comprehensive analysis of the role of business in preserving the environment, continuous environmental improvement, building a corporate environmental profile, and moving towards sustainability (Lyon and Maxwell, 2011). Companies' environmental performance, policies, practices, and future direction are reported in simple and detailed, and in-depth examinations in environmental reports (Azzone et al., 1997).

#### **Corporate Environmental Reporting: Current status and Progress**

Former studies engaged an extent-based contents analysis based on only annual reports disclosures. In modern times, attention to environmental disclosure has been changed from annual reports to different media combining the quality and extent of environmental disclosure which will able to give more extensive and comprehensive pictures of organizational environmental attempts and activities (Van Staden and Hooks, 2007). Any reporting practices largely rely on standards and guidelines, unfortunately, for preparing corporate environmental reporting; there are no such well-established guidelines. Corporations are preparing it on a voluntary basis rather than mandatory having it without any specific format and style (Pramanik et al., 2008). At present, in terms of evaluating the quality of environmental reporting disclosure, companies are achieved the highest score in

Vol. 13, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS

corporate profile and general disclosure s such as reports design, accessibility, awards obtained, etc. but any financial information regarding current, past, and future environmental expenditures are not disclosed by companies (Van Staden and Hooks, 2007). There are no regulations for enforcing environmental disclosure containing environmental information. Indian companies provided more environmental information on their websites than annual reports (Chatterjee and Mir, 2008). International developments in environmental reporting during the last decades disclosed that global environmental reporting practices are far away from satisfactory levels (Lodhia, 2004).

#### **Factors Influencing Corporate Environmental Reporting**

Development of environmental legislation and market-oriented emission trading schemes are found to encourage companies to be more accountable regarding environmental issues such as greenhouse gas emission and waste generation (Clarkson et al., 2011). By compiling and issuing environmental reports on a voluntarily periodic basis, companies are approaching investors regarding environmental issues. But due to a lack of external and third parties verification, such types of environmental reports come under questions of credibility. This low level of credibility is also accelerated by the absence of environmental reporting standards (Beets and Souther, 1999). The number of independent and female directors on a board was found to have a significant positive influence on the extent of environmental reporting practices (Kathy et al., 2012). Environmental responsiveness measures for the factors such as size and industry were found to have significant positive influences on environmental disclosures (Van Staden and Hooks, 2007).

#### **Environmental Degradation and Real-estate companies**

Loss of biodiversity and ecosystems, water logging, flooding pollution, reduction of vegetation, groundwater depletion, temperature increase, and a reduction in agriculture and fishing are considered major environmental problems faced by Dhaka right now for land conversion in the Environmentally Critical Areas (ECA) (Nahrin, 2020). With the rising real estate investment in cities leading to the capturing and reducing green space, rapid population concentration, mismatching of resources, urban green coverage, population density, industrial structure, and finally air quality has changed drastically (Chen and Lee, 2020). Environmental pollution is now considered a global and universal problem. The development of the real estate industry leads to consuming huge resources and generating large amounts of pollutants from the construction industry. With the rapid expansion and continuous development of the real estate industry, environmental pollution will continue to increase on large scale. Finally, the enlargement of the real-estate industry found to have negative impacts on inland and coastal areas (Gong and Kong, 2022). Urban sprawl found to have a long-run equilibrium relationship with environmental pollution. Subsequently, fixed asset investment and foreign direct investment accelerate urban environmental pollution (Zhang, 2021). In order to reduce environmental degradation, studies suggested cities should promote green development of real estate, and related industries, enhance environmental awareness, environment-friendly technological progress, improve investment structure, use environment-friendly building materials, Guiding population flow, and promote industrial upgrading (Chen and Lee, 2020; Gong and Kong, 2022).

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#### **Environmental Impacts of Engineering (Automobiles) Industry**

The increase in business activities and industrial expansion is contributing to the loss of ecological biodiversity. Environmental pollution and degradation are considered a growing problem globally due to different reasons in different parts of the world. Industrial advancement in automobiles, power plants, growing urbanizations, and increased fuel uses are continued to emit significant amounts of pollutants, wastewater, industrial waste disposal, and vehicular emissions into the environment (Fayiga et al., 2018). Energy consumption, surface quality, and air pollution is considered extreme challenge for the automobile industry and lead to a growing demand for more fuel-efficient t vehicles for reducing energy consumption and reducing air pollution. Additionally, using heavier materials such as steel or copper is considered another source of environmental pollutants that can be replaced by using aluminum properties (Miller et al., 2000). A large degree of dependency on cars for private transportation putting extra pressure on natural resources such as fossil fuel leads increase auto emissions, accordingly energy-efficient automobile technology is the preferred policy option for minimizing the environmental effects of the automobile industry. Automobile industries have an association with the increase in traffic capacity, traffic flow, and parking capacity leads to greater concern regarding environmental sustainability and social equity (Gan, 2003). With the growth and expansion of the automotive sector, change in health, social, and environmental effects have taken place. Furthermore, technological developments and regularity interventions relating to the motor industry provide benefits to mitigate the adverse and frequent divesting impacts on human health and the environment (Williams and Blyth, 2023).

#### **Literature Review**

#### Why environmental reporting is the matter?

During recent decades, exponential growth in non-financial reporting such as environmental, social, and sustainability reporting is observed worldwide in order to inform their social and environmental performance through print-based reporting and websites. Now it is at the center of attention among industry bodies, associations, government institutions, consulting firms, nongovernmental organizations, and research institutions. For greater accountability, gain, maintenance, and repair legitimacy, public acceptance, and stakeholder engagement environmental reporting is rational and relevant. Environmental reporting positively contributes to greater business efficiency, market drivers, enhancement of reputation and risk management, stakeholders' management, internal champions, and mimetic motivations (Herzig and Schaltegger, 2011). Environmental management recognizes biodiversity conservatism as an important aim because biodiversity is the cornerstone for healthy ecosystems as well as quantifying the estimate of the cost benefits of their outcomes including the value of biodiversity lost and preserved. Additionally, environmental management safeguards and enhances the environmental state to sustain economic and social benefits from the ecosystems (Laurila-Pant et al., 2015). Corporate sustainability is the process of incorporating entities' economic, environmental, and social performance indicators in reporting but unfortunately, concern for ecology has become sidelined. Additionally, Triple Bottom Line (TBL) initiatives and Global Reporting Initiative (GRI) are contributing insufficient conditions for sustaining earth ecology (Mile and Gray, 2013). Rapid industrialization is responsible for the exploitation of the natural environment which disturbed ecological balance, this, in turn, has raised the issue of environmental protection among environmentalists, governments, organizations, and the international community

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from all over the world. Accordingly, environmental sustainability has become an important agenda for them (Yadav and Pathak, 2013).

#### Environmental reporting practices of engineering (automobile) industry

Environmental reporting emerged as a tool of enhancement and reporting for environmental protection, by fulfilling corporate social responsibility and adding value to the business, comprehensive environmental management provides completive advantages to the companies. Environmental management found to have an influence on economic, social, and legal consequences. In a few cases, environmental reporting appeared as unsystematic and non-comparable and aimed at publicity than providing environmental facts and figures (Sahay, 2004). Stray and Ballantine (2000) studied a survey as to whether a company discloses or does not disclose environmental information from the automobile, banking, electronics, food, drink, and water sectors in the UK in their annual reports and found sectoral differences in reporting. Furthermore, environmental reporting has been considered as a serious aspect for large corporate houses thus impacting the socio-economic and environmental set of the country. Environmental reporting was taken for ensuring global sustainability and sustainable societal welfare. Indian automobile sectors revealed a mixed performance in environmental reporting (Basak and Das, 2021). In recent decades, due to the growing number of environmental dangers to humanity such as oil spills, plastic solid waste, the overuse of nonrenewable energy, contaminated air, hurricanes, tsunamis, and global warming, environmental issues appeared as a significant global concern. Lack of knowledge and inadequate strategic planning appeared as significant barriers to economic, social, and environmental reporting practices (Toke and Kalpande, 2022).

#### Environmental reporting practices real-estate industry

According to GAAP, green accounting and reporting practices is the process of discovering, measuring, reorganizing, and presenting financial information to a variety of stakeholders. Additionally, environmental accounting can be used to provide relevant environmental information for decision-making as well as help management address the environmental implications of organizational actions. A number of studies and projects have been initiated and executed on environmental management systems in industrialists' economies (Toke and Kalpande, 2022). During the last two decades, increased requirements for corporate sustainability are observed. Since, the real estate industry has been regarded as one of the major contributors to atmospheric climate change, and resource exploitation. Accordingly, the real estate industry bears a high level of responsibility for making sustainable corporate management and communication thereof. In addition, corporate sustainability is not simply altruism; in fact, it is considered a success factor for companies as it has a positive impact on stock price and corporate valuation (Ansari et al., 2015). According to Rashidfarokhi et al., (2018) that sustainability reports appeared as inconsistency in the context of form, extent, and quality. Furthermore, a lack of a clear approach to embracing materiality, external assurance, and stakeholder engagement in the sample reports is found in sustainability reports. Finally, in order to fulfill the legislative requirement, sustainability reports are issued by real-estate companies and avoid financial or legal risk. The real-estate sector is criticized for generating almost 30 percent of global greenhouse gas emissions hence the environmental risk disclosure practices of this sector play an important role in carbon disclosure and mitigation. Also, marginal level of environmental disclosure such as greenhouse gas emission, energy consumption, waste management, and sustainability is

Vol. 13, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS

found in real-estate companies in their annual reports (Ufere et al., 2017). Accordingly, to remain competitive in the market and attract investors to the markets, the real-estate sector is required to meet both regional and global best practices with respect to environmental disclosure.

#### International initiation towards environmental reporting

General and sector-specific framework and guideline documents, regularity disclosures, and reporting requirements are seen in national and international aspects incorporating environmental issues in sustainability reporting (Herzig and Schaltegger, 2011). The sustainability reporting guidelines of the Global Reporting Initiative (GRI) reinforced institutional sustainability (Mile and Gray, 2013). In order to create awareness about environmental sustainability, several conferences and programs such as Earth Summit, United Nations Environmental program were organized frequently by the global community. Accordingly, environmental protection and sustainability are being treated significantly and initiatives have been taken by government and organizations for the existence of human health and well-being. Furthermore, social, economic, and environmental sustainability is playing a vital role in ensuring sustainable growth and development (Yadav and Pathak, 2013).

#### **Environmental reporting in Bangladesh**

Information on society has been disclosed most extensively followed by decent work and labor practices and environmental issues in corporate sustainability of major commercial banks in Bangladesh in accordance with Global Reporting Initiatives (GRI 16) (Khan et al., 2011). Environmental disclosure practices in the annual reports of listed Banking, Non-Banking, Chemicals and Pharmaceuticals, Cement, Ceramic, Fuel & Power, and Textile industry of Bangladesh reported that modes of corporate environmental reporting are mostly qualitative in nature and diversified in locations. Accordingly, the level of corporate environmental reporting tends to have positive effects on Return on assets and earnings per share (Akther, 2017). Belal (2000) reported that very limited environmental disclosure has been made in the annual reports of Bangladeshi companies. Furthermore, 90% of companies made very limited environmental disclosure in their annual reports. A study attempted by Uddin et al (2019) to investigate environmental disclosure reporting practices in the annual reports of the companies listed on DSE concluded that no company disclose any monetary information regarding environmental aspects as well as non-monetary disclosure was very limed and inadequate. Web-based corporate environmental reporting in Bangladesh is very limited (Dutta and Bose, 2008). Afterward, the corporate environmental reporting practice of the companies operating in Bangladesh in annual reports is found to have very insufficient as well as there is a positive relationship of environmental reporting with corporate profitability (Saha and Akter, 2012). Management leadership, regulators, external stakeholders' pressure, branding corporate image, poverty alleviation motive, and social obligation motive appeared as the motivations for corporate, social, and environmental responsibility practices and reporting in Bangladesh. At the same time, lack of regularity framework, the tendency to noncompliance with the laws, socio-economic problems, lack of awareness and education in sustainable development, and lack of initiative from the government have appeared as barriers to corporate, social, and environmental responsibility practices and reporting. The overall corporate, social, and environmental responsibility practices in Bangladesh are very insufficient (Hossain et al., 2012).

Vol. 13, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS

Though corporate environmental reporting emerged as a growing concern in communicating environmental issues, organizational impacts on the environment, organizational policies, initiatives, and responses towards mitigating environmental risk and achieving environmental sustainability, unfortunately, in Bangladesh, it is not flourished as expected. As well as, Bangladesh is one of the most climate-vulnerable countries. Recently, Bangladesh faced frequent natural disasters as a result of global warming and climate changes. As a coastal state and to achieve UN SDGs in time corporate environmental reporting is a must. At the same time, most of the environmental studies have been carried out in the context of developed countries. Only a handful of studies are initiated in developing nations like Bangladesh. Concentrating on the global climate change challenges and achieving UN-stated Sustainable Development Goals (SDGs), no studies are available from the engineering (automobile) industry, service, and real-estate industry listed on Dhaka Stock Exchange (DSE), Bangladesh.

Successively, this study aims to investigate the level and extent of environmental risk disclosure practices of the companies from the engineering (automobile) industry, service, and real-estate industry listed on the Dhaka Stock Exchange (DSE), Bangladesh. Additionally, this study will make a significant contribution to the environmental reporting literature in the context climate vulnerable countries towards ensuring environmental sustainability as a climate change mitigation approach. Finally, compare to what extent the environmental reporting practices differ between the engineering (automobile) industry, service, and real estate industry.

#### Methodology

#### Data Set

The data set has been constituted with the data of 46 companies from two sectors of Dhaka Stock Exchange (DSE), namely Engineering (Automobiles) and Service and Real-estate. There are 42 listed companies under Engineering (Automobiles) industry and 4 companies under the Service and Real-estate industry as of 31st January 2023. An exhaustive investigation of the annual reports of 46 companies from both sectors has been completed based on the predetermined environmental risk reporting practices index for the year 2021-2022.

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#### Selected Companies

Name of the companies (Engineering: Automobiles): (42 companies as on 31st January, 2023) Table 1

List of selected companies from Engineering (Automobiles)

Sl. No.	Name of the companies	Acronym
1.	Aftab Automobiles Limited	AAL
2.	Anwar Galvanizing Ltd.	AGL
3.	AppolloIspat Complex Limited	AICL
4.	Atlas Bangladesh Ltd.	ABL
5.	Aziz Pipes Ltd.	APL
6.	Bangladesh Building Systems Ltd.	BBSL
7.	BBS Cables Limited	BBSCL
8.	Bangladesh Autocars Ltd.	BAL
9.	Bangladesh Lamps Limited	BLL
10.	Bd.ThaiAluminium Ltd.	BdTAL
11.	Bengal Windsor Thermoplastics Ltd.	BWTL
12.	Bangladesh Steel Re-Rolling Mills Limited	BSRRML
13.	BSRM Steels Limited	BSRMSL
14.	Coppertech Industries Limited	CIL
15.	Deshbandhu Polymer Limited	DPL
16.	Dominage Steel Building Systems Limited	DSBSL
17.	Eastern Cables Ltd.	ECL
18.	Golden Son Ltd.	GSL
19.	GPH Ispat Ltd.	GPHIL
20.	IFAD Autos Limited	IFADAL
21.	Kay &Que (Bangladesh) Ltd.	KQBL
22.	KDS Accessories Limited	KDSAL
23.	Mir AkhterHossain Limited	MAHL
24.	Monno Agro & General Machinery Limited	MAGML
25.	Nahee Aluminum Composite Panel Ltd.	NACPL
26.	Navana CNG Limited	NCNGL
27.	National Polymer Industries Ltd.	NPIL
28.	National Tubes Limited	NTL
29.	Olympic Accessories Limited	OAL
30.	Oimex Electrode Limited	OEL
31.	Quasem Industries Ltd.	QIL
32.	Rangpur Foundry Ltd.	RFL
33.	Renwick Jajneswar& Co (Bd) Ltd.	RJCBDL
34.	Ratanpur Steel Re-Rolling Mills Limited	RSRRML
35.	Runner Automobiles Limited	RAL
36.	S. Alam Cold Rolled Steels Ltd.	SACRSL
37.	Shurwid Industries Limited	SIL
38.	Singer Bangladesh Limited	SBL
39.	S. S. Steel Limited	SSSL
40.	Walton Hi-Tech Industries PLC	WHTIPLC
41.	Western Marine Shipyard Limited	WMSL
42.	Yeakin Polymer Limited	YPL

Source: (Dhaka Stock Exchange)

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Name of the companies (Service: Real-estate): (4companies as on 31st January, 2023) Table 2

*List of selected companies from Service(Real-estate)* 

Sl. No.	Name of the companies	Acronym
1.	Eastern Housing Limited	EHL
2.	SAIF Powertec Limited	SAIFPL
3.	Samorita Hospital Limited	SaHL
4.	Summit Alliance Port Limited	SAPL

Source: (Dhaka Stock Exchange)

#### **Development of Index**

#### Environmental Risk Reporting Practices Index for Engineering Industry (ERRPIEI):

Authors have developed an environmental risk reporting practices index for the engineering industry (ERRPIEI) based on 'Best Environmental Management Practices for the Car Manufacturing Sectors' issued by JRC science for policy reports published by European Commission and other existing literature. ERRPIEI constitutes seven broad heads and the total index items addressed here is 53. Details are given in Table 3.

Table 3
Environmental Risk Reporting Practices Index for Engineering Industry(ERRPIEI)

	minerial hisk hepoting i ractices mack for Engineering maastry(Enth 121)	
	A. Environmental Management (EM)	
1.	Sites with an advanced environmental management system (% of	EM <sub>1</sub>
	facilities/operations)	
2.	Number of environmental performance indicators (EPIs) that are in	$EM_2$
	general use throughout the whole organization and/or which are	
	reported on in environmental statements;	
3.	Use of internal or external benchmarks to drive environmental	$EM_3$
	performance (Y/N)	
	B. Energy Management (EnM)	
4.	Establishing an energy policy, strategy, and action plan;	EnM <sub>1</sub>
5.	Gaining active commitment from senior management;	$EnM_2$
6.	Performance measurement and monitoring;	$EnM_3$
7.	Staff training;	$EnM_4$
8.	Communication;	$EnM_5$
9.	Continuous improvement; Investment	$EnM_6$
10.	Increasing the efficiency of energy-using processes	EnM <sub>7</sub>
11.	Renewable and alternative energy use	EnM <sub>8</sub>
12.	Optimization of lighting in automotive manufacturing plants	EnM <sub>9</sub>
13.	Rational and efficient use of compressed air	EnM <sub>10</sub>
14.	Optimization of electric motor usage	EnM <sub>11</sub>
-	C. Waste Management (WM)	
15.	Reduce through forward planning, prolonging the product's life before it	$WM_1$
	becomes waste,	
16.	Improved methods of manufacturing and the management of supply	$WM_2$
	chain waste.	
17.	Reuse materials in their current form.	$WM_3$
18.	Measurement and monitoring of waste generation	$WM_4$

	NAGEMENT SCIENCES	
	, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS	\A/B 4
19.	Procedures and methodologies	WM <sub>5</sub>
20.	Provision of waste logistics	WM <sub>6</sub>
21.	Partnerships and stakeholder engagement	WM <sub>7</sub>
22.	Recover energy from waste through combustion or more advanced	$WM_8$
	techniques.	
	D. Water Management (WrM)	14/ 14
23.	Water use strategy and management	WrM <sub>1</sub>
24.	Assess water usage and discharge;	WrM <sub>2</sub>
25.	Assess risks in local watershed and supply chain;	WrM <sub>3</sub>
26.	Create a plan on how to use water more efficiently and improve	$WrM_4$
27	wastewater discharge;	147.54
27.	Collaboration with the supply chain and other organizations;	WrM <sub>5</sub>
28.	Hold the organization and others accountable; 6. Communicate results.	WrM <sub>6</sub>
29.	Water-saving opportunities in automotive plants	WrM <sub>7</sub>
30.	Water recycling and rainwater harvesting	WrM <sub>8</sub>
31.	Green roofs for storm water management	WrM <sub>9</sub>
	E. Biodiversity Management (BoM)	
32.	Select the scope;	$BoM_1$
33.	Identify priority ecosystem services (qualitative);	$BoM_2$
34.	Analyse trends in priority services;	BoM <sub>3</sub>
35.	Identify business risks and opportunities;	$BoM_4$
36.	Develop strategies.	BoM <sub>5</sub>
	F. Supply Chain Management and Design (SCMD)	
37.	Tracking materials using the IMDS (International Material Data System);	$SCMD_1$
38.	Requiring direct suppliers to have certified or verified environmental	$SCMD_2$
	management systems;	
39.	Setting environmental improvement goals and collaborating with Tier 1	$SCMD_3$
	suppliers53 on how to achieve them, typically to - Reduce waste and	
	increase recycling - Reduce energy consumption and CO2 emissions -	
	Increase the percentage of sustainable materials in purchased	
	components - Improve biodiversity;	
40.	Supporting suppliers to improve their environmental impact;	SCMD <sub>4</sub>
41.	Monitoring and enforcement.	SCMD <sub>5</sub>
42.	Reduce unnecessary packaging while ensuring adequate functionality	SCMD <sub>6</sub>
	(parts integrity, ease of access);	
43.	Investigate alternative materials for packaging which are either less	SCMD <sub>7</sub>
	resource intensive, or easier to reuse / recycle;	
44.	Develop reverse logistics for returning empty packaging to suppliers /	SCMD <sub>8</sub>
	recuperate from customers in a closed loop;	
45.	Investigate alternative uses for disposable packaging to divert from	SCMD <sub>9</sub>
	disposal (higher up in the "waste hierarchy"55).	
46.	Ensure sustainability of resources;	$SCMD_{10}$
47.	Ensure minimal use of resources in production and transportation;	SCMD <sub>11</sub>
48.	Ensure minimal use of resources during the use phase;	SCMD <sub>12</sub>
49.	Ensure appropriate durability of the product and components;	SCMD <sub>13</sub>
50.	Enable disassembly, separation and purification;	SCMD <sub>14</sub>
51.	Enable comparisons among different kinds of mobility concepts.	SCMD <sub>15</sub>

Vol. 13, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS

	G. Remanufacturing (RMNF)	
52	Level of remanufacturing (weight per component (%)	RMNF <sub>1</sub>
53	Overall remanufacturing levels (% of recovered components).	$RMNF_2$

Source: Developed by authors

#### Environmental Risk Reporting Practices Index for Services and Real Estate (ERRPISE)

The environmental risk reporting practices index for the services and real-estate industry (ERRPISE) is developed by the authors existing literature on environmental reporting and guidelines issued by World Economic Forum Industry Agenda Council on the Future Real Estate and Urbanization 2016. Additionally, the authors have taken some instructions from 'Overview Real-estate Companies Environmental Performance' issued on October 2021 by European Public Real-estate Association. ERRPISE constitutes six broad heads and the total index items addressed here is 61. Details are given in Table 4.

Table 4
Environmental Risk Reporting Practices Index for Services and Real Estate (ERRPISE)

Environmental RISK Reporting Practices index for Services and Real Estate (ERRPISE)					
A.	A. Strategy and Governance toward Environmental Sustainability (SGES)				
1.	Companies have integrated a sustainability strategy into corporate	$SGES_1$			
	governance.				
2.	Specific ESG committees	SGES <sub>2</sub>			
3.	A roadmap targeting reducing emissions through long-term goals for a more sustainable future.	SGES <sub>3</sub>			
4.	Integrate carbon data into the overall strategy, particularly in companies involved in building activities.	SGES <sub>4</sub>			
5.	Green finance	SGES <sub>5</sub>			
6.	Assets' certification on carbon emissions during the whole life cycle of	SGES <sub>6</sub>			
	the assets.				
7.	Digital Inspections and Predictive Maintenance	SGES <sub>7</sub>			
8.	HVAC Analytics and Occupancy Adaptation	SGES <sub>8</sub>			
9.	Smart Asset Optimization	SGES <sub>9</sub>			
10.	Data Management Platform	SGES <sub>10</sub>			
11.	Material Efficiency	SGES <sub>11</sub>			
12.	Green Lease	SGES <sub>12</sub>			
13.	End of Life and Zero Waste Construction	SGES <sub>13</sub>			
14.	Retrofit and Adaptation for Life-Span Extension	SGES <sub>14</sub>			
В.	Reduction and Optimization Initiatives (ROI)				
15.	The use of renewable energies such as hydrogen, wind, solar, geothermal, etc	ROI <sub>1</sub>			
16.	Energies generated from bio waste	$ROI_2$			
17.	Efforts to reduce energy consumption and	ROI <sub>3</sub>			
18.	Reducing energy consumption	ROI <sub>4</sub>			
19.	Efforts to reduce associated emissions	ROI <sub>5</sub>			
20.	Reducing CO2 emissions	ROI <sub>6</sub>			
21.	Replaced existing equipment with lower energy-consuming solutions	ROI <sub>7</sub>			
22.	Developed self-generated renewable energies (own solar panels, for example).	ROI <sub>8</sub>			

Vol. 13, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS

Vol. 13, N	lo. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS	
23.	Managed energy supply directly in order to reduce their carbon footprints	ROI <sub>9</sub>
24.	Introducing biodiversity areas into existing buildings through the creation of vegetated surfaces	ROI <sub>10</sub>
25.	Growing quantity of sustainable and recycled materials and low energy consumption materials.	ROI <sub>11</sub>
26.	Implemented responsible supply chains (choice of suppliers, transportation of materials, environmental qualities of procurement).	ROI <sub>12</sub>
27.	The architecture and design are also indicated as good ways to reduce the buildings' carbon footprint.	ROI <sub>13</sub>
28.	Carpooling and car-sharing through dedicated app;	ROI <sub>14</sub>
29.	Bicycle rack;	ROI <sub>15</sub>
30.	Charging stations for electric cars;	ROI <sub>16</sub>
31.	New buildings at proximity of proper commutation networks.	ROI <sub>17</sub>
32.	Facilitating the use of green mobility solutions is particularly significant	ROI <sub>18</sub>
	for shopping centers located in the outskirts of larger cities.	
33.	Recovery system for grey water or rain/storm water (using rainwater recovery tanks);	ROI <sub>19</sub>
34.	Water-saving devices in washrooms (pressure reducers, dual-flow flushes, infrared sensors, etc.);	ROI <sub>20</sub>
35.	Scan sensors to detect leaks at an early stage and automatically shut off	ROI <sub>21</sub>
	the tap if required;	
36.	Smart irrigation systems (drip irrigation, automatic timers etc.);	ROI <sub>22</sub>
37.	Removing all air-cooling towers or shutting-off solenoid valves in order to	ROI <sub>23</sub>
37.	cut off the .water supply outside predefined hours.	110125
38.	Using the best of innovation to improve their environmental impact	ROI <sub>24</sub>
C.		110124
39.	A sustained dialogue between owner, manager and tenants in order to	CJCE <sub>1</sub>
	encourage responsible environmental practices	
40.	Raise awareness is included in the daily actions	CJCE <sub>2</sub>
41.	Environmental Awareness Campaigns;	CJCE <sub>3</sub>
42.	Green leases (environmental clauses included in leases for example);	CJCE <sub>4</sub>
43.	Recommendations and rules shared with tenants;	CJCE <sub>5</sub>
44.		3
	Reporting consumption data to tenants.	CJCE <sub>6</sub>
45.		CJCE <sub>6</sub>
45. 46.	Internal communication aimed for employees on CSR policies,	CJCE <sub>6</sub> CJCE <sub>7</sub>
46.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations.	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub>
	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental	CJCE <sub>6</sub> CJCE <sub>7</sub>
46. 47.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub>
46.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub>
46. 47. 48.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance of real estate operations and asset management policies	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub>
46. 47. 48.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance of real estate operations and asset management policies  Different Metrics (DM)	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub> CJCE <sub>10</sub>
46. 47. 48.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance of real estate operations and asset management policies  Different Metrics (DM)  The total amount of direct and indirect energy used by renewable	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub>
46. 47. 48. D.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance of real estate operations and asset management policies  Different Metrics (DM)  The total amount of direct and indirect energy used by renewable sources.	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub> CJCE <sub>10</sub>
46. 47. 48.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance of real estate operations and asset management policies  Different Metrics (DM)  The total amount of direct and indirect energy used by renewable sources. The total amount of direct and indirect energy used by non-renewable	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub> CJCE <sub>10</sub>
46. 47. 48. D. 49.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance of real estate operations and asset management policies  Different Metrics (DM)  The total amount of direct and indirect energy used by renewable sources. The total amount of direct and indirect energy used by non-renewable sources in a building over a full reporting year.	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub> CJCE <sub>10</sub> DM <sub>1</sub>
46. 47. 48. D.	Internal communication aimed for employees on CSR policies, Chose to team up with GOs, local and national bodies and corporations. Ensure that decisions contribute to improvements in environmental sustainability at the local and urban levels Commit to continuous improvement in the environmental performance of real estate operations and asset management policies  Different Metrics (DM)  The total amount of direct and indirect energy used by renewable sources. The total amount of direct and indirect energy used by non-renewable	CJCE <sub>6</sub> CJCE <sub>7</sub> CJCE <sub>8</sub> CJCE <sub>9</sub> CJCE <sub>10</sub>

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52.	The total amount of direct and indirect GHG emissions generated from	$DM_4$
	energy consumption in a building over a full reporting year.	

53. Track the environmental performance of real estate assets and DM<sub>5</sub> operations on a continuous basis.

54. Assess the ecological footprint, and exposure to risk from natural shocks, DM<sub>6</sub> environmental regulation and the economic impacts of climate change.

55. Identify explicit targets for improving environmental sustainability DM<sub>7</sub> performance

56. Commitment to minimize emissions of greenhouse gases and to DM<sub>8</sub> increasing use of renewable resources.

# E. Environmental Sustainability Reporting (ESR) 57. Board level responsibility for monitoring and disclosing sustainability ESR<sub>1</sub> performance. 58. Environmental Monitoring ESR<sub>2</sub> 59. Environmental initiatives ESR<sub>3</sub> 60. Eco-friendly Measures and Sustainability ESR<sub>4</sub> 61. Embed adherence to best in class sustainability standards in all aspects ESR<sub>5</sub>

Source: Developed by authors

of our real estate operations

#### **Development of Models**

Calculation of corporate environmental reporting performance of thecompanies from Engineering Industry

$$CERPEI = \frac{Attained\ score\ of\ ERRDPITLI\ of\ each\ company}{Total\ Indexed\ Items\ (ERRDPITLI)} \times 100$$

Calculation of corporate environmental reporting performance of thecompanies from Services and Real-estate Industry:

$$CERPSRI = \frac{Attained\ score\ of\ ERRDPITLI\ of\ each\ company}{Total\ indexed\ items\ (ERRDPITLI)} \times 100$$

Comparison between the CERP<sub>EI</sub> and CERP<sub>SRI</sub>:

$$\label{eq:acerpei} \begin{aligned} \text{ACERPEI} &= \frac{\textit{Average of Attained score of ERRDPITEI all companies}}{\textit{Average of Total indexed items (ERRDPITEI)} for the industry} \\ &\times 100 \end{aligned}$$

#### **ACERPEI**

$$= \frac{Average \ of \ Attained \ score \ of \ ERRDPITSEI \ all \ companies}{Average \ of \ Total \ indexed \ items \ (ERRDPITSRE) for \ the \ industry} \times 100$$
 Where,

CERP<sub>EI</sub> = Corporate Environmental Reporting Performance (Engineering Industry)
CERP<sub>SRI</sub>= Corporate Environmental Reporting Performance (Services and Real Estate Industry)
ERRPIEI= Environmental Risk Reporting Practices Index for Engineering Industry
ERRPISEI = Environmental Risk Reporting Practices Index for Services and Real Estate Industry

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# Analysis, Results and Discussion Corporate environmental reporting practices of engineering industry

Table 5
Corporate environmental reporting performances of engineering industry

Sl. No.	Name of the companies	Acronym	Score	Score in %
1.	Aftab Automobiles Limited	AAL	1	1.89
2.	Anwar Galvanizing Ltd.	AGL	0	0
3.	Appollolspat Complex Limited	AICL	1	1.89
4.	Atlas Bangladesh Ltd.	ABL	0	0
5.	Aziz Pipes Ltd.	APL	0	0
6.	Bangladesh Building Systems Ltd.	BBSL	5	9.43
7.	BBS Cables Limited	BBSCL	0	0
8.	Bangladesh Autocars Ltd.	BAL	0	0
9.	Bangladesh Lamps Limited	BLL	0	0
10.	Bd.ThaiAluminium Ltd.	BdTAL	0	0
11.	Bengal Windsor Thermoplastics Ltd.	BWTL	3	5.66
12.	Bangladesh Steel Re-Rolling Mills Limited	BSRRML	1	1.89
13.	BSRM Steels Limited	BSRMSL	1	1.89
14.	Coppertech Industries Limited	CIL	3	5.66
15.	Deshbandhu Polymer Limited	DPL	2	3.77
16.	Dominage Steel Building Systems Limited	DSBSL	3	5.66
17.	Eastern Cables Ltd.	ECL	0	0
18.	Golden Son Ltd.	GSL	0	0
19.	GPH Ispat Ltd.	GPHIL	6	11.32
20.	IFAD Autos Limited	IFADAL	2	3.77
21.	Kay &Que (Bangladesh) Ltd.	KQBL	3	5.66
22.	KDS Accessories Limited	KDSAL	0	0
23.	Mir AkhterHossain Limited	MAHL	0	0
24.	Monno Agro & General Machinery Ltd.	MAGML	0	0
25.	Nahee Aluminum Composite Panel Ltd.	NACPL	0	0
26.	Navana CNG Limited	NCNGL	0	0
27.	National Polymer Industries Ltd.	NPIL	6	11.32
28.	National Tubes Limited	NTL	3	5.66
29.	Olympic Accessories Limited	OAL	3	5.66
30.	Oimex Electrode Limited	OEL	0	0
31.	Quasem Industries Ltd.	QIL	1	1.89
32.	Rangpur Foundry Ltd.	RFL	0	0
33.	Renwick Jajneswar& Co (Bd) Ltd.	RJCBDL	0	0
34.	Ratanpur Steel Re-Rolling Mills Limited	RSRRML	4	7.55
35.	Runner Automobiles Limited	RAL	0	0
36.	S. Alam Cold Rolled Steels Ltd.	SACRSL	3	5.66
37.	Shurwid Industries Limited	SIL	0	0
38.	Singer Bangladesh Limited	SBL	2	3.77
39.	S. S. Steel Limited	SSSL	0	0
40.	Walton Hi-Tech Industries PLC	WHTIPLC	7	13.21
41.	Western Marine Shipyard Limited	WMSL	3	5.66
42.	Yeakin Polymer Limited	YPL	0	0

Source: Authors estimations

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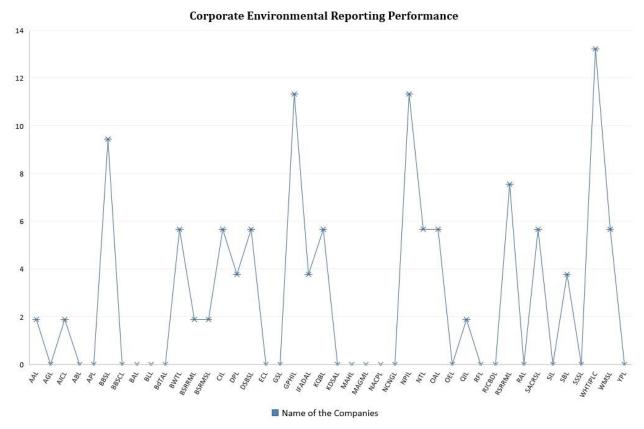


Fig.1 Corporate environmental reporting performances of engineering industry

Illustration: In the above table and chart we have shown 42 Engineering industries those are working under Dhaka Stock Exchange (DSE), Bangladesh and their score and score percentage based on Environmental Risk Reporting Practices Index for Engineering Industry (ERRPIEI). We are looking that the gaining score of most of the companies are negative and some are very inferior position that is 1-7 within 53 index items and score percentage is within 0-14% only. So, it's clear that the Engineering Industry under DSE is not thoroughly eager to practice Corporate Environmental Reporting for Achieving Environmental Sustainability.

# Corporate environmental reporting practices of service and real-estate industry Table 6

Corporate environmental reporting performances of service and real-estate industry

Sl. No.	Name of the companies	Acronym	Score	Score in %
1.	Eastern Housing Limited	EHL	14	23.7288
2.	SAIF Powertec Limited	SAIFPL	8	13.5593
3.	Samorita Hospital Limited	SaHL	5	8.47458
4.	Summit Alliance Port Limited	SAPL	4	6.77966

Source: Authors estimations

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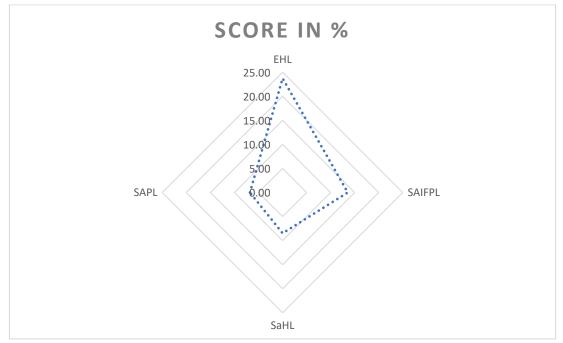


Fig. 2.Corporate environmental reporting performances of service and real-estate industry

**Illustration:** In the above table and chart we have shown 4 service and real-estate industries those are working under Dhaka Stock Exchange (DSE), Bangladesh and their score and score percentage based on Environmental Risk Reporting Practices Index for Services and Real Estate (ERRPISE). It is observing here that the score of the companies are 4-14 within 61 index items and gaining percentage between 6% to 24%. So, we can say that they have little favor to practice Corporate Environmental Reporting for Achieving Environmental Sustainability.

# **Industry** wise average performance of corporate environmental reporting practices Table 7

Corporate environmental reporting performances (industry wise)

Name of industry	Average Score
Engineering Industry	1.5%
Services and Real Estate Industry	7.75%

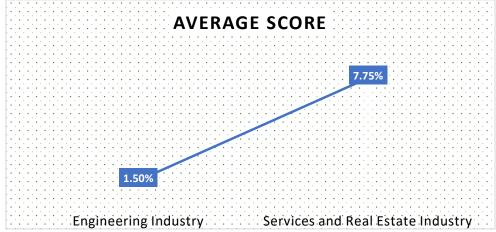


Fig. 3.Industry wise average performance of corporate environmental reporting practices

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**Illustration:** The former table and chart, we have shown average performance of Engineering Industry and Services and Real Estate Industry. Though both are performing below standard, the aggregate performance of Services and Real Estate Industry is better than Engineering Industry. The average score of Engineering Industry is very poor that is 1.50% compared with Services and Real Estate Industry that is 7.75%. Both Industries need to improve the practice to corporate environmental reporting for sustainable development.

#### Conclusion

Global warming and climate change is considered as one of the most arduouschallenges of the century especially for climate change vulnerable countries such as Bangladesh. Growing global warming and climate change are calling for mitigation and adaptation approaches for achievingenvironmental sustainability. Corporate environmental reporting tends to add value by playing role in reporting environmental aspects leads to reducing pollutants and GHG emissions, enhancing capacity building, and finally managing companies to engage in creating broad scale impact on adaptation and mitigations approaches towards achieving corporate environmental sustainability. Accordingly, this study aims to investigate corporate environmental reporting of 'Real-estate, Engineering, and Automobiles Industry' listed at Dhaka Stock Exchange (DSE), Bangladesh for achievinglong-termenvironmental sustainability. It is found that due to lack of compulsory legal framework for corporate environmental reporting practices, companies are disinclined to report environmental aspect in reporting properly. Companies didn't disclose all information regarding the decisions and activities affect the environment. Companies are highlighting the positivity and non-financial information in their annual reports. In comparison between engineering and services and real estate sectors, service and real-estate industry appeared to disclose environmental aspect than engineering industry in their annual reports. In conclusion, legitimacy and legal obligations play significant role in environmental disclosure practices of the companies. To make the companies more accountable in terms of environmental performance, combination of mandatory requirements and strong enforcement mechanisms are required.

#### **Policy Implication**

The present study significantly contributes to the existing literature as well as provides substantial insights to policymakers, exchange commission, environmentalists, and other stakeholders by adding values in corporate environmental reporting which is a must for achieving environmental sustainability and finally leads to achieving UN-stated SDGs. Categorically, the contribution of this study in relation to policy implications is described in detail as follows

Firstly, this study could be used as a crypt for expanding regulators' guidelines in the context of the 'Environmental Risk Reporting Practices Index for the Engineering (automobile) Industry' by adding specifications of environmental management, energy management, waste management, water management, biodiversity management, and supply chain management and design. At the same time, the 'Environmental Risk Reporting Practices Index for Services and Real Estate (ERRPISE)' including strategy and governance toward environmental sustainability, reduction, and optimization initiatives, communicating and joining the collective effort, different metrics, and environmental sustainability reporting. Secondly, this study suggested incorporating environmental reporting on an obligatorybasis with strong monitoring.

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Thirdly, the engineering (automobile) industry, service, and real-estate industry were found to have a strong direct linked with environmental degradation, and global initiation was also found in the context of adapting a regularity framework. The study feedback could be used to incorporate it into actions.

Fourthly, this study expanded the existing literature by addressing 52 index items for Environmental Risk Reporting Practices Index for Engineering (automobile) Industry and 56 index items for value by opening Environmental Risk Reporting Practices Index for Services and Real Estate (ERRPISE)'.

Fifthly, as a representative of the climate-vulnerable country list, Bangladesh residues an issue of exhaustive investigation, and that is done.

Finally, an exclusive and in-depth analysis of all companies under engineering (automobile) and services and real-estate industry listed on the Dhaka Stock Exchange (DSE), Bangladesh have been completed and able to provide insights to the concerned policymakers in developing climate mitigation approaches.

#### **Future Direction**

In this study, annual reports of the year 2020-2021have been evaluated. In future, this study can be extended by comparing with others years. Existing study also be extended by studding the influence of corporate environmental reporting on corporate financial performance.

#### Acknowledgement

The authors are grateful to University Grants Commission (UGC), Bangladesh for the financial support.

#### References

- Akther, T. (2017). Corporate Environmental Reporting and Profitability: A Study on Listed Companies in Bangladesh. *Jagannath University Journal of Business Studies*, 5(1), 99-104.
- Ansari, N., Cajias, M., & Bienert, S. (2015). The value contribution of sustainability reportingan empirical evidence for real estate companies. *Journal of Finance and Risk Perspectives*, 4(4), 190-205.http://doi.org/10.5283/epub.36379
- Azzone, G., Brophy, M., Noci, G., Welford, R., & Young, W. (1997). A stakeholders' view of environmental reporting. *Long range planning*, *30*(5), 699-709.https://doi.org/10.1016/S0024-6301(97)00058-7
- Basak, S., & Das, S. (2021). Environmental Reporting Towards Achieving SDGs 2030 –A Study on Automobile Industry in India. *The Management Accountant Journal*, 56(6), 47-50.http://dx.doi.org/10.33516/maj.v56i6.47-50p
- Beets, S. D., & Souther, C. C. (1999). Corporate environmental reports: The need for standards and an environmental assurance service. *Accounting Horizons*, *13*(2), 129-145.https://doi.org/10.2308/acch.1999.13.2.129
- Chatterjee, B., & Mir, Z. M. (2008). The current status of environmental reporting by Indian companies. *Managerial Auditing Journal*, 23(6), 609-629. https://doi.org/10.1108/02686900810882138
- Chen, Y., & Lee, C. C. (2020). The impact of real estate investment on air quality: Evidence from China. *Environmental Science and Pollution Research*, *27*, 22989-23001.https://doi.org/10.1007/s11356-020-08874-2

- Vol. 13, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS
- Clarkson, P. M., Overell, M. B., &Chapple, L. (2011). Environmental reporting and its relation to corporate environmental performance. *Abacus*, *47*(1), 27-60. https://doi.org/10.1016/j.jclepro.2016.03.039
- 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. https://ssrn.com/abstract=1965079
- Fayiga, A. O., Ipinmoroti, M. O., &Chirenje, T. (2018). Environmental pollution in Africa. *Environment, development and sustainability*, 20, 41-73. https://doi.org/10.1007/s10668-016-9894-4
- Gan, L. (2003). Globalization of the automobile industry in China: dynamics and barriers in greening of the road transportation. *Energy policy*, *31*(6), 537-551.https://doi.org/10.1016/S0301-4215(02)00097-6
- Gong, W., & Kong, Y. (2022). Nonlinear influence of Chinese real estate development on environmental pollution: New evidence from spatial econometric model. *International Journal of Environmental Research and Public Health*, 19(1), 588.https://doi.org/10.3390/ijerph19010588
- Herzig, C., & Schaltegger, S. (2011). Corporate sustainability reporting. *Sustainability communication: Interdisciplinary perspectives and theoretical foundation*, 151-169. 10.1007/978-94-007-1697-1 14
- Hossain, M. M., Rowe, A. L., & Quaddus, M. (2012). Drivers and barriers of corporate social and environmental reporting (CSER) practices in a developing country: Evidence from Bangladesh. In 10th Interdisciplinary Perspectives on Accounting Conference, Cardiff University, UK.
- Rao, K., Tilt, C. A., & Lester, L. H. (2012). Corporate governance and environmental reporting: an Australian study. *Corporate Governance: The international journal of business in society*, *12*(2), 143-163.https://doi.org/10.1108/14720701211214052
- Khan, H. U. Z., Islam, A. M., Fatima, K. J., & Ahmed, K. (2011). Corporate sustainability reporting of major commercial banks in line with GRI: Bangladesh evidence. *Social responsibility journal*, 7(3), 347-362.https://doi.org/10.1108/17471111111154509
- Kolk, A. (1999). Evaluating corporate environmental reporting. *Business Strategy and the Environment*, 8(4), 225-237.https://doi.org/10.1002/(SICI)1099-0836(199907/08)8:4%3C225::AID-BSE206%3E3.0.CO;2-4
- Laurila-Pant, M., Lehikoinen, A., Uusitalo, L., &Venesjarvi, R. (2015). How to value biodiversity in environmental management?. *Ecological indicators*, *55*, 1-11. https://doi.org/10.1016/j.ecolind.2015.02.034
- Lodhia, S. K. (2004). A decade of environmental reporting: Is there cause for celebration. *K. E. Karim, & R. W. Rutledge, Environmental disclosure practices and financial performance*, 1-19.
- Lyon, T. P., & Maxwell, J. W. (2011).Greenwash: Corporate environmental disclosure under threat of audit. *Journal of economics & management strategy*, 20(1), 3-41. https://doi.org/10.4324/9781315825120
- Miller, W. S., Zhuang, L., Bottema, J., Wittebrood, A., De Smet, P., Haszler, A., & Vieregge, A. J. M. S. (2000). Recent development in aluminium alloys for the automotive industry. *Materials Science and Engineering: A, 280*(1), 37-49.https://doi.org/10.1016/S0921-5093(99)00653-X

- Vol. 13, No. 2, 2023, E-ISSN: 2225-8329 © 2023 HRMARS
- Milne, M. J., & Gray, R. (2013).W (h) ither ecology? The triple bottom line, the global reporting initiative, and corporate sustainability reporting. *Journal of business ethics*, 118, 13-29. https://doi.org/10.1007/s10551-012-1543-8
- Nahrin, K. (2020). Environmental area conservation through urban planning: case study in Dhaka. *Journal of Property, Planning and Environmental Law*, 12(1), 55-71. https://doi.org/10.1108/JPPEL-11-2018-0033
- 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.
- Rashidfarokhi, A., Toivonen, S., & Viitanen, K. (2018). Sustainability reporting in the Nordic real estate companies: empirical evidence from Finland. *International Journal of Strategic Property Management*, 22(1), 51-63.https://doi.org/10.3846/ijspm.2018.321
- Saha, A. K., & Akter, S. (2012). Relationship between environmental reporting in corporate annual reports & corporate profitability in Bangladesh. *Independent Business Review*, 5(2), 91-111.https://ssrn.com/abstract=2435563
- Sahay, A. (2004). Environmental reporting by Indian corporations. *Corporate Social Responsibility and Environmental Management*, 11(1), 12-22.https://doi.org/10.1002/csr.51
- Stray, S., & Ballantine, J. (2000). A sectoral comparison of corporate environmental reporting and disclosure. *Eco-Management and Auditing: The Journal of Corporate Environmental Management*, 7(4), 165-177. https://doi.org/10.1002/1099-0925(200012)7:4%3C165::AID-EMA138%3E3.0.CO;2-2
- Toke, L. K., &Kalpande, S. D. (2022). Critical analysis of green accounting and reporting practises and its implication in the context of Indian automobile industry. *Environment, Development and Sustainability*, 1-26. https://doi.org/10.1007/s10668-022-02816-3
- Uddin, M. M., Islam, R., Rouf, M. A., &Kayser, M. J. (2019). Environmental Reporting Disclosures Practices of Listed Ceramic and Cement Companies at DSE in Bangladesh. *Global Journal of Management and Business Research*, 19(D5), 7-15.
- 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*, 11(2), 85-92.
- vanStaden, C. J., & Hooks, J. (2007). A comprehensive comparison of corporate environmental reporting and responsiveness. *The British accounting review*, *39*(3), 197-210.https://doi.org/10.1016/j.bar.2007.05.004
- Williams, I. D., & Blyth, M. (2023). Autogeddon or autoheaven: Environmental and social effects of the automotive industry from launch to present. *Science of the Total Environment*, 858, 159987.https://doi.org/10.1016/j.scitotenv.2022.159987
- Yadav, R., & Pathak, G. (2013). Environmental sustainability through green banking: A study on private and public sector banks in India. *OIDA International Journal of Sustainable Development*, 6(08), 37-48.https://ssrn.com/abstract=2385573
- Zhang, H. (2021). The impact of urban sprawl on environmental pollution: empirical analysis from large and medium-sized cities of China. *International Journal of Environmental Research and Public Health*, 18(16), 8650.https://doi.org/10.3390/ijerph18168650