

ARE POLLUTING FIRMS DISCLOSING ENOUGH ON THE ENVIRONMENT?: A CASE OF AN EMERGING ECONOMY

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Abstract *This study attempts to investigate the environmental reporting practices of companies classified under the 'red' category industries in India based on the Global Reporting Initiative guidelines. Content analysis is applied to evaluate the environmental disclosures of companies in seven polluting industrial sectors. The study uses independent sample t-test, analysis of variance, and Tukey's post-hoc tests on a sample of 52 companies listed on the National Stock Exchange during the period 2020-21. Statistically significant differences were revealed in the disclosure levels of companies based on size, industry, and environmental certifications. The cement industry made the highest environmental disclosure, whereas the chemicals and pharmaceutical industries disclosed the least. It was found that companies revealed maximum information on their environmental initiatives and energy consumption, whereas the least disclosures were made on environmental impact mitigation. The study provides an implication for strict adoption of systematic reporting framework, especially for polluting industries, irrespective of their size, to bring uniformity, reliability, and responsibility in their practice.*

Keywords: *Environmental Reporting, Content Analysis, Global Reporting Initiative, Red-Category Industries, Sustainability*

INTRODUCTION

Humans have always considered environment as a perpetual asset in their stride to attain progress, whereas global warming, melting glaciers, reduction in forest cover, degrading marine life, and extinction of flora and fauna species have a different story to narrate. According to the State of India's environment report released by the Centre for Science and Environment in 2019, there was a 136% increase in the number of grossly polluting industries in India since 2011 (Pandey, 2019). As corporations bank upon the ecosystem for much of their needs, it becomes their duty to actively participate in addressing environmental and sustainability issues besides fulfilling the financial goals (Bhatia & Tuli, 2016). International organisations have frequently raised environmental concerns and suggested corrective measures to be implemented at the global level (Pramanik et al., 2007). Likewise, attributing responsibility to the firms to account for their environmental impact has been one such measure to control the environmental damage. Besides, contemporary stakeholders assign value to both financial and non-financial information reported by firms, in their decision-making process (Abhishek et al., 2020). As a consequence, companies are increasingly incorporating Environmental, Social & Governance (ESG) goals in their reports to enhance stakeholder confidence.

ESG reporting is an outcome of a series of international events. The growing environmental concern and the looming fear of ecological catastrophe owing to the fast-paced economic growth was acknowledged internationally at various platforms, such as the United Nations Conference on the Human Environment in 1972, the Brundtland commission in 1987, and many others (Pisani, 2006). Moreover, the occurrence of some unfortunate corporate accidents like Exxon Valdes in 1989 and the Bhopal gas tragedy in 1984 (Laskar & Maji, 2016) consequently led to the formation of the Coalition for Environmentally Responsible Economies (CERES) in 1989 and the Global Reporting Initiative (GRI) in 1997. The purpose of establishing GRI was to build a universal mechanism ensuring environmentally responsible accounting by implementing the principles of stakeholder inclusiveness, sustainability context, and materiality and completeness in its reporting guidelines. The GRI guidelines have been actively promoted by the UNEP and well received and adopted by many organisations in European and American nations. However, being at a nascent stage, sustainability reporting practices vary widely across developed and developing economies. It is often criticised for becoming a trifling escape route for companies to create an illusion of being environment friendly. The main challenges in the reporting of non-financial information are that information disclosed is difficult to measure, non-

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standard, incomplete, imprecise, and misleading as well (Pucker, 2021; Gandhi & Dalvadi, 2017). Hence, various international accounting and reporting bodies are constantly working towards the convergence of sustainability reporting practices followed among different industries (Abhishek et al., 2020).

Environment is the essence of sustainability reporting, but only a few studies have been noted emphasising solely on environmental reporting in the Indian context. Considered as one of the world's fastest growing and largest economies (Dhasmana, 2021), India is expected to play a substantial role in environmental protection. Unfortunately, India has consistently been a poor performer in the 'Environmental Performance Index' published by the World Economic Forum. The recent report on 'Environmental Performance Index 2018' ranked India at 177th place out of 180 nations (Wendling et al., 2018), insinuating that the so-called economic growth came with the huge cost of environmental degradation. In an effort to streamline industrial activities and monitor their environmental impact, the Ministry of Environment, Forest and Climate Change (MoEFCC) released a new industrial classification based on their pollution index. Owing to this, the industries scoring 60 or more on the pollution index have been categorised as 'red' (Ministry of Environment, Forest and Climate Change, 2016). Moreover, Indian authorities have made recommendations and introduced legal provisions to ensure that industries adhere to international environmental protection norms. The first one came from the Securities Exchange Board of India (SEBI) in 2012 when the top 100 listed companies (based on market capitalisation) were required to mandatorily include business responsibility reports, along with their annual reports, from the financial year 2011-2012 onwards. According to a latest SEBI circular released in May 2021, sustainability reporting, along with the business responsibility report, has been made mandatory for the top 1,000 listed entities (by market capitalisation) from FY 2022-23 (SEBI, 2021). The last decade witnessed a sharp increase in the number of companies reporting their environmental performance, both as per the SEBI mandate or as a voluntary practice. However, firms are now reporting in an extensive manner with a view to tackling competition (local and global) and protecting their legitimacy. Despite regulations, Indian companies need a suitable and standardised environmental reporting framework that will bring uniformity, comparability, fairness, and reliability in disclosures (Pramanik et al., 2007; Chatterjee & Mir, 2008). Moreover, there is a dearth of studies emphasising on polluting industries in India (Chaklader & Gulati, 2015; Bhatia & Tuli, 2018; Das & Bhattacharjee, 2020).

Thus, the present study attempts to investigate the environmental performance disclosures of red category industries in India because of their significant impact on

environmental degradation. The objectives of the study are two-fold; first, the study attempts to determine the overall status and extent of environmental disclosures among red category industries in India. Further, the study also tries to investigate the differences in mean environmental disclosure levels of companies categorised on the basis of their size, industry, legal ownership, and environmental certifications.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Rise of Corporate Environmental Reporting

Although the societal and environmental hazards caused by business and industrial development are decades old, the idea of firms reporting such information originated in the United States during the late 1970s when Ernst & Ernst (now Ernst & Young) formed the first of its kind 'social disclosure categories' for companies, including seven sub-themes such as environment, energy, fair business practices, and so on (Gray et al., 1995). The environmental aspect of corporate reporting was emphasised by organisations like the Intergovernmental Panel on Climate Change (IPCC) created by the United Nations (UN) in 1988. The Exxon Valdez oil spill in Alaskan waters in 1989 was a breakthrough event that shook the world, and in response, a group of investors and environmentalists founded a Coalition for Environmentally Responsible Economies (CERES) to seek better ways of doing business and fight against the world's biggest sustainability issues, like climate change, water shortage, and pollution primarily caused by industrial waste (Sengur, 2020). The GRI was founded in 2000 by CERES; it launched its first guidelines on sustainability reporting. Consequently, many large and internationally established companies started making specific environmental disclosures on a voluntary basis to bridge the information gap (Kolk, 2004). According to an international survey conducted by KPMG in 2017, close to 75% of the world's biggest 250 organisations include their non-financial performance in annual publications. As they say, "where the largest firms lead, others inevitably follow" (KPMG et al., 2017). A growing number of companies today are making non-financial disclosures, such as environmental performance. Needless to say, a large share of research done in the domain of sustainability reporting focuses on the first world countries (Chaklader & Gulati, 2015; Bhatia & Tuli, 2018; Chatterjee & Mir, 2008). Earlier studies covered descriptive themes like nature of disclosure (voluntary or mandatory), quality of information disclosed, location of disclosure in reports, and legislations governing such disclosures. Later, more empirical studies were performed to analyse factors

impacting the extent of disclosures, levels of reporting in different industries, value relevance of environmental reporting, and so on. This stack of studies also paved way for the evolution of some prominent socio-economic theories justifying corporate environmental disclosures, profoundly known as the legitimacy theory, stakeholder theory, and political economy theory (Wangombe, 2013; Aggarwal & Singh, 2019).

Environmental Reporting by Polluting Industries

As polluting industries pose significant environmental harm, authorities often levy stringent regulatory requirements on them (Hackston & Milne, 1996). Literature provides two prominent socio-political theories to explain the environmental disclosures by companies – stakeholder theory and legitimacy theory (Freedman, 2005). Legitimacy is described as the state of congruency between the larger social value system and the entity's value system, which is a part of the former (Yusoff et al., 2006). Occurrence of any divergence between the two will prove a threat to the entity's legitimacy (Lindblom, 1994). Identification of any threat to its legitimacy, such as an accident or high pollution levels, pressurises firms to adopt an appropriate strategy to positively influence society's perception. Stakeholder theory is based on the belief that an organisation derives its strength from its stakeholders. Reporting thus acts as a communication tool between the organisation and its stakeholders (Gray et al., 1995). Stakeholder theory encompasses identification and management of stakeholder's expectations to prevent any negative impact on the firm's activities. Hence, both theories support the idea that environmentally polluting firms should make relatively higher environmental disclosures. Few of the previous studies have investigated the relationship between type of industry and environmental disclosures or performance. Patten (2002) and Joshi et al. (2011) found that polluting industries tend to disclose more compared to non-polluting industries, because of social pressure and regulatory pressures. Pahuja (2009) found empirical evidence that 'nature of industry' highly explains the level of environmental disclosure. Freedman and Jaggi (2005) argued that among the world's largest public firms operating in chemical, oil and gas, energy, and motor vehicles and casualty insurance industries, the ones operating in countries which have ratified the Kyoto protocol tend to make more pollution related disclosures than the ones who have not. However, another study by Behram (2015) done on high, medium, and low impact polluting industries failed to validate the legitimacy theory as a driver behind environmen-

tal disclosures in Turkey, as it was found that medium impact industries have a higher tendency to disclose environmental information than high impact industries. Similarly, a study done on Chinese industries by Lin et al. (2020) revealed a significantly negative relationship between environmental disclosures and pollution levels. Overall, it has been noted that the studies conducted across different geographical regions established a contrasting relationship between type of industry and extent of environmental disclosures. Moreover, only a limited number of researches specifically based on polluting industries have been done in the Indian context.

Corporate Environmental Reporting in India

Tata (Automotive) was the first Indian company to publish its sustainability report in 2001 based on GRI guidelines. At first, these disclosures were an effort to match international competition and to improve corporate image (Harte & Owen, 1991; Chaklader & Gulati, 2015) in the society. Only a handful of firms which could afford the extra cost started to report their non-financial activities either in the annual reports or through a separate report. Sahay (2004) conducted a primary survey of leading 250 companies taken from ET 500 in 2003, including a major proportion of companies from oil and gas, automobile, cement, chemical and fertiliser, engineering, fast moving consumer goods (FMCG), mining and metallurgy, pulp and paper, pharmaceutical, and power and telecom sectors. The analysis concluded that barring a few globally recognised Indian companies, the reporting was majorly unsystematic and non-comparable even within the same sector. Sahay (2004) opined that lack of pressure from stakeholders and unregulated compliance mechanisms gave companies the liberty to publicise only their good environmental deeds freely without giving factual data and environmental trends. Singh and Joshi (2009) noted an increasing trend in the environmental consciousness of stakeholders in India, leading to a surge in the number of companies making environmental disclosures. Chatterjee and Mir (2008) observed that because of the lack of regulatory requirements, most companies disclosed environmental information on a voluntary basis to portray a positive picture. Pahuja (2009) found that the environmental performance of a company was the dominant explanatory variable, followed by size and industry, in determining its level of environmental disclosures. In another study by Gupta (2011), polluting industries were found to be disclosing more information than the less polluting industries in India. Environmentally sensitive industries such as oil and gas, metals and mining, generally face more stakeholder pressure

than others in terms of environmental disclosures (Neu et al., 1998; Guidry & Patten, 2010).

To regulate ESG (Environment, Social & Governance) reporting, SEBI mandated the top 100 NSE and BSE listed entities to include a business responsibility report within their annual reports, starting from the financial year 2012. A recent development announced in May 2021 proclaims that business responsibility and sustainability reporting will be made mandatory for top 1,000 listed entities (by market capitalisation) from FY 2022-23 (SEBI, 2021). Although, companies not falling under the purview of mandated category can continue to make voluntary disclosures. In a study by Chaklader and Gulati (2015), it was found that the large sized companies disclosed more as a result of stakeholders' pressure; an environmentally certified firm has to abide by the rules and regulations of the rating agency and thus disclosed more on its environmental impact. Bhatia and Tuli (2018) insinuated that the quality of reporting in developing nations needed to improve and become rational and standardised. Their findings suggest that despite having a higher sustainability disclosure score compared to the developed nations, developing nations were merely found to be reporting in an effort to sustain internationally. Nazli and Mohd (2007) argued that privately held companies disclosed a statistically less significant amount of environmental information compared to government-held companies, because government owned firms attract a higher level of monitoring from stakeholders. In an attempt to investigate this premise, Joshi et al. (2013) carried out an empirical analysis on Indian firms but found no significant evidence.

RESEARCH HYPOTHESES

From an in-depth review of earlier researches in the domain of environmental reporting, this study attempts to empirically test the following hypotheses:

H_1 : There is a significant difference in environmental disclosures across different industrial sectors in India.

H_2 : There is a significant difference in environmental disclosures of large and small capitalisation companies in India.

H_3 : There is a significant difference in environmental disclosures of environmentally certified and non-certified companies.

H_4 : There is a significant difference in environmental disclosures of public sector and private sector companies.

RESEARCH METHODOLOGY

Sample

This study comprises companies classified under the *red category* industries listed by the *Ministry of Environment, Forest and Climate Change* in 2016 (Central Pollution Control Board, 2016), as such industries pose a serious threat to the natural environment and hence, should essentially disclose information on environmental impact (Hackston & Milne, 1996; Sen et al., 2011; Joshi et al., 2011). In addition, our sample included both large and small capitalisation companies to draw a comparison of disclosure levels based on size. Based on this criterion, a total of 32 large capitalisation and 20 small capitalisation companies were selected for the analysis from the NIFTY 100 and NIFTY small cap 100 index as listed on 31st March 2021 (National Stock Exchange, 2021). These companies were classified under the seven red category industries, as shown in Fig. 1.

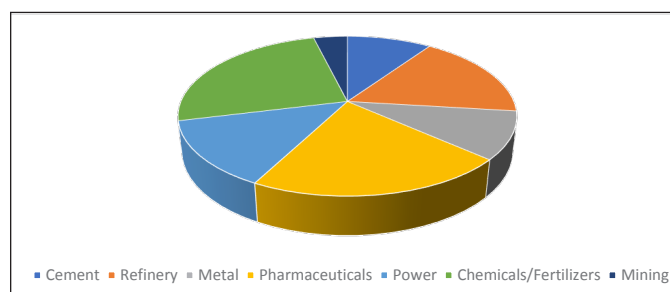


Fig. 1: Industrial Composition of Sample Firms

Data Sources

The data on environmental disclosures is gathered from the corporate annual reports and sustainability reports of the firms included in the sample, for the period of 2020-21. Out of the 52 companies in the sample, 31 published standalone sustainability reports and the remaining 21 disclosed environmental information under the business responsibility report section of the annual reports. The data related to government ownership and international certification has been obtained from the respective annual reports of the companies for the year ending 31st March 2021.

Measurement of Variables and Content Analysis

The current study makes use of content analysis to collect data on environmental disclosures. In simple terms, content

analysis means transforming the content of textual reports or documents into objective and quantitative data (Cowan, 2007) that can be subjected to further parametric analysis. For this purpose, the study uses an Environmental Disclosure Index (EDI) as a research instrument for the measurement of environmental disclosures, which has been adapted from the GRI G4 Index (Singhvi & Desai, 1971; Wiseman, 1982; Cormier & Magnan, 1999). The GRI G4 Index comprises 34 standard disclosures on environment spread across 14 sub-themes (GRI, 2013) as shown in Table 1. The index used in this study is modified to suit the environmental reporting practices in India. Hence, the final Environmental Disclosure Index (EDI) adopted is a checklist of 30 environment performance indicators (Appendix).

Table 1: Themes of Environmental Disclosure Index

Themes of Disclosure	Disclosure Items
Materials	2
Energy	3
Water	3
Biodiversity	4
Emissions	7
Waste	4
Product & Services	1
Compliance & Grievance Redressal	1
Transportation	1
Overall Expenditure	1
Supplier Environmental Screening	1
Initiatives	1
Mission/Vision	1
Governance	1

All the 30 environmental indicators have been given equal importance in terms of disclosure; uniform weights are assigned to avoid subjectivity or bias. This method attempts to evaluate the quality and extent of disclosure using an interval scale. A five-point scale (0-4) has been used for comprehensively assessing the extent and quality of environmental information reported by companies (Table 2). Each of the 30 environmental indicators is assigned a score on a scale of 0 to 4 based on their magnitude of disclosure. Environmental Disclosure Score (EDS) is computed as a relative score ranging from 0% to 100% of the maximum possible disclosure score, i.e. 124 obtained by multiplying 31 by 4. A fairly good number of studies have used this

scoring method as a research instrument in content analysis (Wiseman, 1982; Cormier & Magnan, 1999; Yusoff & Lehman, 2006; Clarkson et al., 2008).

Environmental Disclosure Score (EDS) =

$$\frac{\text{Total disclosure score obtained by company}}{\text{Maximum possible disclosure score}} * 100$$

Table 2: Weighing Scheme

Type of Disclosure	Weight Assigned
No disclosure	0
General and brief statement	1
Qualitative and specific information, with many relevant points not addressed (may include percentages)	2
Quantitative and qualitative information, with detailed methods, standards, and reasoning (relating to current year)	3
Quantitative and qualitative information covering maximum aspects (with yearly comparisons, inter category comparisons, pictorial representations, and so on)	4

Further, the data on company-specific variables such as size, industry, public/private ownership, and international environmental certification (Pahuja, 2009; Gupta, 2013; Chaklader & Gulati, 2015; Kansal et al., 2014) is gathered from NSE factsheet 2021, as well as annual reports of companies.

Reliability of the Instrument

The reliability of the weighing scale has been checked using Krippendorff's alpha and Cronbach's alpha which are found to be 0.801 and 0.95, respectively, indicating that the rating instrument is highly consistent (Krippendorff, 1980).

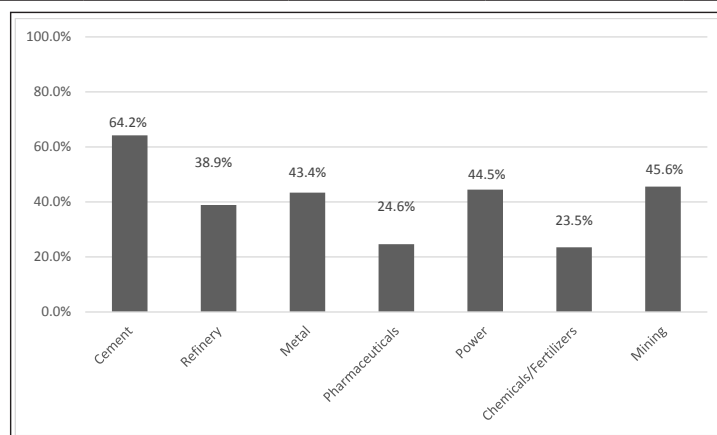
RESULTS

Descriptive Statistics

Out of the 52 sample companies, 31 published sustainability reports according to GRI guidelines. The remaining companies furnished environmental disclosures as a part of their annual reports primarily under the sections 'business responsibility report' (BRR) or 'management discussion & analysis'.

Table 3: Descriptive Statistics of EDS (Industry-Wise)

Industry	Mean EDS	Number of Companies	Std. Deviation	Minimum	Maximum
Cement	64.2%	5	13.9%	41.9%	75.8%
Refinery	38.9%	9	21.4%	11.3%	69.4%
Metal	43.4%	5	16.6%	18.5%	64.5%
Pharmaceuticals	24.6%	11	17.0%	5.6%	55.6%
Power	44.5%	7	18.6%	9.7%	61.3%
Chemicals/Fertilisers	23.5%	13	16.8%	5.6%	53.2%
Mining	45.6%	2	8.6%	39.5%	51.6%
Total	35.9%	52			

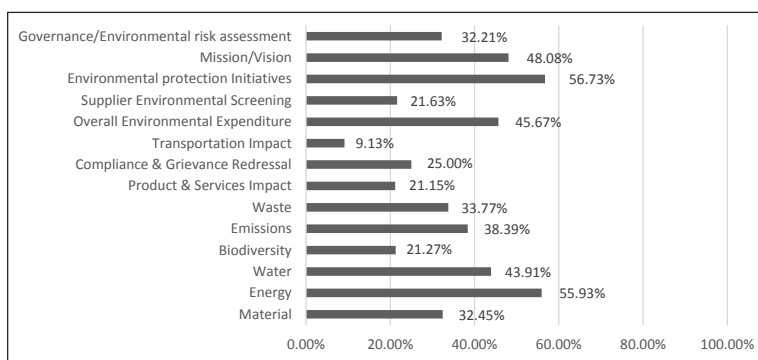
**Fig. 2: Environmental Disclosure Levels of Industries**

It is evident from Table 3 and Fig. 2 that the cement industry makes the highest mean environmental disclosure at 64.2%, varying within the range 41.9% to 75.81%. Further, the data suggests that the highest environmental reporting is done by a firm belonging to the cement industry. The lowest average environmental disclosure, at 23.5%, is done by the chemicals/fertilisers industry. All other industries disclose environmental information at an average level ranging from 30% to 50%,

with the pharmaceutical being an exception at 24.6%.

Theme-Wise Environmental Disclosures

This sub-section deals with the disclosure levels of individual environmental themes. The data here discloses the mean percentage of information reported by organisations under each of the 14 environmental themes.

**Fig. 3: Environmental Theme-Wise Mean Level of Disclosures (%)**

According to Fig. 3, companies are the keenest and most generous when reporting about their environmental initiatives. Overall, the companies are found to be publishing

an average of 56.7% information on environmental initiatives. The next in sequence is the information reported on energy usage, generation, and energy saved at

56%. Similarly, disclosures at 45.6% and 48% are made regarding overall environmental expenditure and mission/vision themes incorporating environmental concern. Data on other environmental themes such as water, biodiversity, waste, emissions, governance, and so on, are disclosed at relatively lower levels, ranging from 20% to 40%. Lastly, the disclosures on the environmental impact of transportation of goods are the least, at 9.13%.

Inter-Industry Environmental Disclosures

With a further aim to examine the differences in environmental disclosure levels among each of the eight industries, an analysis of variance (ANOVA) test has been conducted, the results of which are discussed below:

Table 4: One-Way ANOVA: Inter-Industry Comparison

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8455.807	6	1409.301	4.527	0.001
Within Groups	14008.411	45	311.298		
Total	22464.217	51			

Table 4 shows an F-statistic of 4.527 significant at 1% level. This indicates that the environmental disclosure levels among various industrial groups indeed vary significantly. Moreover, a Tukey's post-hoc test was conducted to identify the industries whose mean environmental disclosure levels were significantly different from each other. The results identified the cement industry's disclosure levels as being significantly higher than that of the pharmaceutical and chemicals/fertilisers industry.

Environmental Disclosures based on Company Size (Market Capitalisation)

To examine the differences in the mean environmental disclosure levels of large and small capitalisation firms, an independent samples t-test has been conducted as follows:

Table 5: Size-Wise Descriptive Statistics

Large/Small	Mean	N	Minimum	Maximum
Small Capitalisation	19.76%	20	5.65%	53.23%
Large Capitalisation	45.99%	32	13.71%	75.81%
Total		52		

Table 5 explicitly shows that large capitalisation firms have a higher average environmental disclosure score (45.9%) compared to small capitalisation firms (19.76%). However, to check whether the difference is statistically significant, an independent samples t-test has further been done.

Table 6: Independent Samples T-Test

T-Test for Equality of Means			
T	Df	Sig. (2-tailed)	Std. Error Difference
-5.502	50	.000	4.77%

The output in Table 6 holds that the average environmental disclosure scores of large capitalisation companies is significantly higher than that of small capitalisation companies.

Environmental Disclosures based on Government Ownership

To examine the differences between the environmental disclosures of groups of companies divided on the basis of government ownership, an independent samples t-test has been conducted. Table 7 depicts that, on an average, the government-owned (public sector) firms disclose higher environmental information than the non-government (private sector) firms.

Table 7: Sector-Wise Descriptive Statistics

Public/Private	Mean	N	Minimum	Maximum
Public Sector	37.50%	12	9.68%	69.35%
Private Sector	35.42%	40	5.65%	75.81%
Total	35.90%	52	5.65%	75.81%

However, Table 8 reveals that the difference between the environmental disclosure levels of public and private sector firms is statistically insignificant. The results show a p-value of 0.771, which is insignificant. Hence, it cannot be concluded that public sector firms disclose higher level of environmental information compared to private sector firms.

Table 8: Inter-Sector Independent Samples T-Test

T-Test for Equality of Means			
T	Df	Sig. (2-tailed)	Std. Error Difference
0.296	17.93	.771	7.02%

Environmental Disclosures based on ISO Certification

In this section, we compare the mean environmental disclosure levels of companies grouped on the basis of ISO environmental certification. Companies which have obtained an international environmental management certification are believed to adopt and follow a well-specified environmental management system (Monteiro & Guzman, 2010). The independent samples t-test has been used to ascertain the variances.

Table 9: Group-Wise Descriptive Statistics based on ISO Certification

Certification Obtained	N	Mean EDS	Minimum	Maximum
No	22	24.41%	5.65%	74.19%
Yes	30	44.33%	11.29%	75.81%

Table 9 shows that companies with an international environmental certification have a higher mean disclosure level of 44.33% compared to the mean disclosure level of 24.41% of companies without international environmental certification. Further, the independent t-test results in Table 10 reveal a p-value of 0.001, indicating a statistically significant difference between the disclosure levels of the two groups.

Table 10: Independent Samples T-Test

T-Test for Equality of Means			
T	Df	Sig. (2-tailed)	Std. Error Difference
-3.692	40.18	.001	5.39%

DISCUSSION

Corporate environmental reporting is a recent phenomenon in the Indian scenario which began in response to internal and external forces. It was started as a voluntary practice by a few large companies; however, in the past decade, SEBI released mandates (FY 2012, 2015, and 2021) for listed entities to publish business responsibility reports every year. However, in the financial year 2020-2021 (post the SEBI mandate), this study found that an average of only 35.9% of the environmental information measured as per GRI guidelines was reported by listed Indian companies, which is a seemingly low figure compared to their counterparts in developed nations. One explanation can be that the scope of SEBI mandate which came in 2015 was only limited to the top 500 listed companies on NSE/BSE. Further, this mandate required companies to furnish business responsibility reports

addressing certain aspects of environment which do not even account for 10% of what GRI has recommended. Notably, a majority of the companies were merely fulfilling the minimal data requirements of the GRI index in an effort to meet international reporting standards and gain competitive advantage domestically. It is argued that some companies provide environmental reports just to build an illusion to protect their legitimacy (Sahay, 2004; Pramanik et al., 2007; Joshi et al., 2011; Chaklader & Gulati, 2015). The primary reason cited behind these low levels of disclosure is the absence of stringent regulations for environmental reporting.

Secondly, the findings reveal that most environmental disclosures are confined to energy, emissions, and environment protection initiatives. There seems to be a lack of motivation in companies towards capturing other areas of environmental disclosures, such as supplier screening, transportation, and specific environmental cost and liabilities. Further, disclosures were predominantly either positive or neutral, suggesting that companies are careful while disclosing information which might impact their goodwill (Chatterjee & Mir, 2008). Overall, it can be stated that environmental reporting in India is characterised as being inadequate, unsystematic, and conveniently done (Sahay, 2004). It lacks a formal structure and transparency in terms of third-party verification.

Thirdly, the findings suggest that companies belonging to the cement, fertiliser, and refinery industries make the maximum environmental disclosures. Ambuja Cement Ltd. made the highest environmental disclosures at 75.81%. On the other hand, the pharmaceuticals and chemicals/fertilisers industries reported poorly, averaging at 24.6% and 23.5%, respectively. The huge differences between industries have been verified using one-way ANOVA, which found the differences to be statistically significant. It is observed that industries which are relatively more capable of polluting the environment are exposed to greater monitoring and regulations, which compels them to be more transparent and responsible with their operations. A similar contention is put forward by the legitimacy theory that highly polluting industries are held more accountable by the society as they project a greater risk towards the environment (Lindblom, 1994). However, industries like the pharmaceuticals and chemicals have substantially ignored the environmental disclosures in their reports in spite of being classified under the red category. Some companies did not even publish any sustainability report separately. The reporting requirements for pharma and chemical industries should be strictly implemented to prevent these companies from omitting their environmental impact information.

Fourthly, large capitalisation companies are found to disclose significantly more environmental information

than small capitalisation companies. The explanation is given by both the stakeholder and legitimacy theory. The legitimacy theory purports that larger firms utilise greater resources of the society and environment, and thus have a greater responsibility towards them, whereas the stakeholder theory argues that larger firms involve greater interests and expectations of stakeholders, therefore companies have to cater to their expectations to avoid conflicts. Hence, the findings of this study support the socio-political theories of disclosure, i.e. legitimacy and stakeholder.

Lastly, it is evident from the findings that companies having a certified environmental management system in place, more comprehensively to address environmental responsibilities and report in accordance with the implemented guidelines (Chaklader & Gulati, 2015). The findings revealed that companies with ISO 14000 environmental certification reported significantly higher environmental information than others. Surprisingly, almost 57.7% of the companies have obtained ISO environmental certification to strive for international acknowledgement. The obvious reason behind certified companies providing efficient disclosures is the presence of a definite framework and guidance of international certification authorities. In conclusion, the findings of this study support hypotheses H1, H2, and H3, while they do not support hypothesis H4.

CONCLUSION

Sustainability or ESG information is a corporate buzzword today which has attracted the stakeholders' attention like never before. However, the absence of a universal framework on ESG reporting has given enough freedom to the firms to report their environmental information in a manner that is desirable and convenient to them. On the basis of the findings and analysis, it can be concluded that mean corporate environmental disclosure levels are quite low in India. One reasonable argument to this can be seen in the disclosure laws stated by SEBI, which have made it mandatory to make such disclosures only for a set of 500 companies.

Further, the findings signalled a significantly low environmental disclosure by small capitalisation companies in India, which can be attributed to the absence of environmental reporting regulations on such companies. It is suggested that irrespective of the scale of operations of the firm, regulatory bodies like SEBI and the Ministry of Corporate Affairs should bring all polluting firms under the scanner of environmental disclosures, because red category industries, no matter how small, have an unbridled impact on the environment. Moving to another finding, the empirical results show a significant difference in disclosure

levels among industrial classifications; for instance, cement at 64.2% and chemicals/fertilisers at 23.5%. This finding, on one hand, accentuates the sincerity of industries in making environmental disclosures, and on the other, prompts the regulatory bodies to monitor the defaulting industries. One way of ensuring effective environmental disclosure from environmentally sensitive industries can be subjecting their reports to mandatory sustainability assurance services by third parties.

Additionally, the study provides empirical evidence to the corporate policy makers and regulatory authorities to assess the status of environmental reporting in India Inc. and take steps to reduce asymmetry in the environmental disclosure practices, to bring them at par with international standards like GRI, which has gained global popularity in recent decades. Further, to enable a sustainable future economic growth, the Indian government needs to ensure that environmental/sustainability reporting is implemented and independently verified to assure fairness and transparency as is done in the case of financial reporting. The present economic scenario is inflicted with unfortunate corporate frauds and siphoning of funds, often in the name of corporate social responsibility (CSR). Hence, it is recommended that authorities should have a well-defined environmental reporting framework clearly specifying the amount of environmental costs, carbon emissions, water treatment, waste disposal, and so on. It is also suggested to consider external sustainability assurance as a mandatory part of reporting requirements by listed polluting companies to enhance their credibility (Hazaee et al., 2021). Lastly, installing an environmental management system by environmentally harmful industries is perceived to bring improvement in their environmental performance.

LIMITATIONS OF THE STUDY

Future studies can undertake a comparative analysis of India with other developing and developed countries to get a better idea of India's status in environmental reporting at the global level. The content analysis technique used in this study is limited to annual and sustainability reports. Future researches can be conducted using alternate sources of data, such as surveys and interviews, to verify the results of this study. Moreover, a time series study starting from the period when environmental reporting began in India can be done in the future to identify the trends in environment and sustainability reporting in India. Lastly, it is important to note that a huge small and medium scale sector forms a part of India Inc. which has not been included in this analysis. According to the latest mandate by SEBI, the top 1,000 companies (market capitalisation) listed on NSE and BSE are now required to make mandatory ESG (Environmental, Social & Governance) disclosures in BRSR, effective

from FY 2022-23. However, the small and medium sector enterprises in India have not been brought under the purview of mandatory ESG reporting as yet. Hence, it gives a leeway for researchers to explore the state of environmental disclosures and practices adopted by them.

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APPENDIX

Environmental Disclosure Index

1	Materials used by weight or volume
2	Percentage of materials used that are recycled input materials
3	Energy consumption within/outside the organisation
4	Energy intensity
5	Reduction of energy consumption/requirements/energy saved/generated
6	Total water withdrawal by source
7	Water sources significantly affected by withdrawal of water
8	Percentage and total volume of water recycled and reused/saved
9	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas
10	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas
11	Habitats protected or restored/initiatives
12	Total number of IUCN red list species and national conservation list species with habitats in areas affected by operations, by level of extinction risk
13	Direct greenhouse gas (GHG) emissions (scope 1)
14	Energy indirect greenhouse gas (GHG) emissions (scope 2)
15	Other indirect greenhouse gas (GHG) emissions (scope 3)
16	Greenhouse gas (GHG) emissions intensity
17	Reduction of greenhouse gas (GHG)/emissions
18	Emissions of ozone-depleting substances (ODS)
19	NO _x , SO _x , and other significant air emissions
20	Total waste water/effluent discharge by quality and destination
21	Total weight of waste by type and disposal method
22	Biodiversity value of water bodies and related habitats significantly affected by the organisation's discharges of water and runoff
23	Total number and volume of significant spills
24	Extent of impact mitigation of environmental impacts of products and services

25	Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations + number of grievances about environmental impacts filed, addressed, and resolved through formal grievance mechanisms
26	Significant environmental impacts of transporting products and other goods and materials for the organisation's operations, and transporting members of the workforce
27	Total environmental protection expenditures and investments by type
28	Environmental protection initiatives
29	Vision and strategy claims/policies
30	Governance and environmental risk assessment/EMS

Abbreviations Used

ANOVA Analysis of Variance

BRR Business Responsibility Report

BRSR Business Responsibility &
Sustainability Report

BSE Bombay Stock Exchange

CSR

Corporate Social Responsibility

EDI

Environmental Disclosure Index

EDS

Environmental Disclosure Score

ESG

Environmental, Social &
Governance

GRI

Global Reporting Initiative

IPCC

Intergovernmental Panel on Climate
Change

ISO

International Standards Organisation

MCA

Ministry of Corporate Affairs

MOEFCC

Ministry of Environment, Forests &
Climate Change

CERES

Coalition for Environmentally
Responsible Economies

FMCG

Fast Moving Consumer Goods

NSE

National Stock Exchange

SEBI

Securities & Exchange Board of
India

UN

United Nations