An Analysis of Industry-Specific Variations and Sectoral Differences in Sustainability Disclosure Among Indian Manufacturing Companies

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Abstract

The importance of understanding industry-specific variations and sectoral differences in sustainability disclosures is critical in today's corporate landscape. Rapid urbanisation and industrialisation in India have created significant challenges for manufacturing companies, including environmental degradation, income inequality, and greenwashing. Balancing sustainability with economic growth remains a persistent issue, particularly in a developing economy like India. This study assesses the degree of industry-specific variations and sectoral differences in sustainability disclosures within the annual reports of 22 Indian manufacturing companies across various sectors. The study adopts a quantitative method and ex post facto research design, utilising data from the annual reports of sampled manufacturing companies for the fiscal years 2021–2022. The total enumeration sampling technique was employed, and data were validated through cross-examination of the annual reports by auditors. Content analysis was used to address key questions regarding document selection, environmental disclosure criteria, data processing, and scoring. Despite the increasing adoption of frameworks like the Global Reporting Initiative (GRI), International Integrated Reporting Council (IIRC), and Business Responsibility and Sustainability Reporting (BRSR-SEBI), greater knowledge and integration of these standards remain necessary. The findings highlight industry-specific trends, with some sectors demonstrating stronger commitments to sustainability reporting. The study concludes that Indian companies show a growing dedication to transparency and the adoption of sustainability frameworks, though sectoral differences persist. These findings underscore the need for standardized reporting practices and greater alignment with global sustainability goals to enhance corporate accountability and environmental stewardship.

1. Introduction

The imperative for sustainable business practices has become increasingly prominent, positioning environmental, social, and governance (ESG) factors as central to corporate strategy, particularly within the manufacturing sector (Gazzola et al., 2024). This sector, due to its inherent resource intensity and potential for environmental impact, faces escalating pressure to enhance transparency and accountability regarding its sustainability performance (Ahmad & Wong, 2018). In India, rapid urbanisation and industrialisation have created significant challenges for manufacturing companies, including environmental degradation, income inequality, and greenwashing (Kumar et al., 2023). Balancing sustainability with economic growth remains a persistent issue, especially in a developing economy like India, where regulatory frameworks and stakeholder expectations are evolving rapidly.

Sustainability disclosure, which refers to the process by which businesses communicate their ESG practices, has become a critical tool for enhancing corporate transparency and accountability (Wagenhofer, 2023). In India, the landscape of sustainability disclosures is marked by significant industry-specific variations and sectoral differences, influenced by the unique challenges and opportunities faced by each industry in implementing sustainable practices (Kumar et al., 2023).

The growing emphasis on sustainability reporting is further driven by regulatory frameworks and stakeholder demands. In India, the Securities and Exchange Board of India (SEBI) mandates listed companies to disclose their ESG initiatives, aligning with global frameworks such as the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) (Miklosik et al., 2021). However, despite these regulatory pushes, the adoption of sustainability frameworks remains uneven across industries, with some sectors demonstrating stronger commitments to sustainability reporting than others (Thassim, 2025). For example, heavy industries like steel and cement are often subject to stringent environmental regulations, leading to more detailed disclosures on emissions, energy consumption, and waste management (Dhar et al., 2020). In contrast, knowledge-based industries such as IT and financial services prioritize governance and social responsibility disclosures over environmental concerns (Thassim, 2025; Kanoo et al., 2024).

Despite the increasing adoption of sustainability reporting frameworks like GRI, IIRC, and BRSR-SEBI, there is a lack of comprehensive understanding of how industry-specific variations and sectoral differences influence sustainability disclosures among Indian manufacturing companies. While heavy industries such as steel and cement are often subject to stringent environmental regulations, leading to more detailed disclosures on emissions, energy consumption, and waste management (Dhar et al., 2020), knowledge-based industries such as IT and financial services prioritize governance and social responsibility disclosures over environmental concerns (Thassim, 2025; Kanoo et al., 2024). This inconsistency raises questions about the effectiveness of current reporting practices and the extent to which they meet stakeholder expectations. Furthermore, there is limited research on how different sectors within the Indian manufacturing industry approach sustainability reporting, particularly in terms of environmental, social, and governance (ESG) disclosures. This gap in understanding hinders the development of standardized reporting practices that could enhance transparency and accountability across industries.

This study is significant for several reasons. First, it provides a detailed analysis of sustainability disclosure practices in the Indian manufacturing sector, highlighting the variations across different industries. This understanding is crucial for policymakers and regulators to develop more effective and standardized reporting frameworks that can enhance transparency and accountability (Jha & Rangarajan, 2020). Second, the study contributes to the growing body of literature on sustainability reporting by focusing on a developing economy like India, where the regulatory environment and stakeholder expectations are still evolving (Kumar et al., 2023). Third, the findings of this study can help corporate leaders and sustainability practitioners better understand the factors influencing sustainability disclosures and develop strategies to improve their reporting practices (Thassim, 2025). Finally, by identifying the gaps in current reporting practices, this study can inform future research and policy initiatives aimed at promoting sustainable business practices in India (Ahmad & Wong, 2018).

2. Literature Review

Sustainability disclosure refers to the process by which businesses disclose their environmental, social, and governance (ESG) practices, providing stakeholders such as investors, regulators, and the general public with information about a company's sustainability performance (Wagenhofer, 2023). The literature indicates a growing trend towards the adoption of global frameworks such as the Global Reporting Initiative (GRI), which has significantly influenced Indian companies' sustainability reporting practices (GRI Disclosure Database, 2017). Thassim (2025) emphasises the widespread use of the GRI framework, especially in terms of environmental disclosures, particularly concerning greenhouse gas emissions. Despite this adoption, Thassim (2025) also highlights sectoral differences in compliance with sustainability practices, where industries like banking and financial services show more extensive adherence to sustainability reporting compared to sectors such as FMCG and insurance. This variation points to the need for industry-specific approaches to enhance the transparency and relevance of sustainability disclosures.

The challenges of implementing the BRR standard have also been documented, with suggestions to simplify the framework to encourage broader adoption by large enterprises (Gesellschaft für Internationale Zusammenarbeit, 2014). This has led to mixed findings on the effectiveness of mandatory reporting requirements in improving CSR and sustainability disclosures (Laskar & Maji, 2016; Manchiraju & Rajgopal, 2017; Goel, 2019; Jadiyappa et al., 2019). One major concern is the limited scope of indicators reported by companies, which often lack clarity on whether the data are estimations or actual measurements. Such ambiguity compromises the credibility and completeness of sustainability reports, leading to concerns about the accuracy of disclosed performance indicators (Chaudhri & Wang, 2007).

Despite the increasing prevalence of sustainability reporting, the integration of environmental and social concerns with economic aspects remains a work in progress. As noted in the GRI Disclosure Database (2017),

global standards like GRI have facilitated some improvements, but inconsistencies across industries still persist. Recent studies, such as Khan et al. (2016), demonstrate that high-quality sustainability disclosures enhance corporate reputation and stakeholder trust, particularly when aligned with material ESG factors. Similarly, Albitar et al. (2020) highlight how regulatory frameworks and institutional pressures shape disclosure maturity—a critical consideration in evolving markets like India.

In the Indian context, the level of sustainability practice adoption remains varied. While Goel & Misra (2017) observe that CSR reporting is still developing, Joshi and Li (2022) attribute this variation to differences in firm size, governance structures, and sector-specific regulations. Regulatory interventions, such as the mandate requiring companies to spend at least 2% of their average net profit on CSR activities (Ministry of Corporate Affairs, 2011; SEBI Circular, 2012), have played a pivotal role in shaping the reporting landscape. However, as Drempetic et al. (2020) emphasise, the effectiveness of such policies depends on enforcement and firms' internal commitment to sustainability integration.

Furthermore, regulatory updates, such as the Companies Act of 2013, have significantly impacted the quality and depth of sustainability disclosures, particularly in high-impact sectors like agrochemicals, cement, and chemicals (Jessop et al., 2024). These updates have pushed companies to improve their alignment with global best practices and adopt more comprehensive reporting models. Jessop et al. (2024) argue that local legitimacy concerns, especially in industries with high environmental risks, also significantly influence the depth of disclosures, underscoring the need for tailored approaches across sectors.

While there is a growing number of companies producing sustainability reports, enhancing their scope and usefulness remains an ongoing challenge (Godha & Jain, 2015). The need for greater transparency and thoroughness in reporting is crucial to building stakeholder trust and ensuring the reliability of disclosed information (Chaudhri & Wang, 2007). Maqbool and Zamir (2019) argue that CSR and sustainability reporting have become increasingly important in India, with regulatory measures, such as the introduction of the Companies Act 2013, acting as a catalyst for improving transparency in sustainability reporting.

The government's push for sustainability reporting was further reinforced with the introduction of the National Voluntary Guidelines (NVGs) in 2011 and the mandatory reporting of Business Responsibility Reports (BRR) by the top 100 listed companies (Ministry of Corporate Affairs, 2011; SEBI, 2012). As of 2016, this requirement was extended to the top 500 listed companies (SEBI, 2016), with the compression of principles making the reporting process more accessible for larger enterprises. These developments have laid the foundation for a more standardized approach to sustainability reporting, although variations remain across industries.

In particular, industry - specific factors heavily influence the extent and nature of sustainability disclosures. The manufacturing sector, especially heavy industries like steel and cement, is subject to stringent environmental regulations due to its significant environmental footprint (Dhar et al., 2020). As a result, companies in these sectors often present more detailed disclosures on their environmental performance, focusing on emissions, energy consumption, and waste management (Belaid, 2022). For example, Tata Steel's sustainability report highlights its efforts to reduce carbon emissions and improve energy efficiency (KPMG, 2023). Conversely, companies in service sectors like IT and financial services tend to focus more on social and governance aspects, with reports emphasizing employee welfare, diversity, and ethical business practices (IFRS, 2024). This sectoral distinction is also evident in industries such as chemicals and pharmaceuticals, where regulatory oversight mandates comprehensive sustainability disclosures to ensure compliance with environmental and health regulations (Dhar et al., 2020).

Kalyan et al. (2024) further emphasise the role of company longevity in shaping sustainability reporting practices, noting that older companies in industries such as pharmaceuticals and steel often have more detailed sustainability reports. This finding underscores the influence of industry characteristics and company maturity on the depth of sustainability disclosures, with sectors like textiles and chemicals showing comparatively lower levels of sustainability reporting.

The increasing importance of sustainability disclosures in India is further explored by studies such as those by Kumar et al. (2023), Goel (2019), and Laskar & Maji (2016), which emphasise the need for businesses to align their environmental disclosures with stakeholder expectations. Larger companies with foreign influence and robust environmental policies are more likely to produce comprehensive sustainability reports (Kumar et al., 2023; Dash & Mohanty, 2023). The importance of transparency and stakeholder involvement in sustainability reporting is further highlighted in the work of Bewley & Li (2000), and recent studies like those of Kumar et al. (2023), which demonstrate how sustainability disclosures can enhance the reputation of Indian companies by aligning environmental performance with key business outcomes.

In conclusion, while sustainability reporting in India is progressing, it remains a work in progress, with significant industry-specific differences in the scope and depth of disclosures. The implementation of frameworks like BRR and the introduction of the BRSR model by SEBI have been crucial steps in standardizing and improving the quality of sustainability disclosures. However, as highlighted by Kanoo et al. (2024), further research is necessary to refine the reporting process, ensuring greater transparency and relevance across diverse sectors, especially those with high environmental impacts.

2.1 Theoretical Justification

Freeman et al. (2018) Stakeholder Theory serves as a foundational framework for understanding the diverse groups and individuals that can influence an organisation. This theory provides a comprehensive view of stakeholders, encompassing almost all entities that can impact an organisation, ranging from employees and customers to local communities and regulatory bodies (Kolk & Pinske, 2006). As sustainability disclosure becomes increasingly important, organisations are facing pressure from various stakeholders to provide transparent and meaningful environmental, social, and governance (ESG) information (Agle et al., 2021). Stakeholder Theory is particularly useful for explaining the motivations behind sustainability disclosures, as companies must navigate the often-conflicting demands of multiple groups to balance shareholder value with broader social and environmental responsibilities.

In the Indian manufacturing sector, the application of Stakeholder Theory is evident in the varying pressures exerted by primary and secondary stakeholders across industries. For instance, heavy industries such as steel and cement face heightened scrutiny from environmental regulators and local communities, leading to more comprehensive environmental disclosures (Thassim, 2025; Jessop et al., 2024). In contrast, sectors like IT and financial services, driven by employee and investor expectations, prioritize social and governance aspects in their sustainability reports (Kanoo et al., 2024; Bania & Biswas, 2024). These sector-specific stakeholder dynamics underscore the theory's utility in explaining variations in sustainability disclosure practices (Freeman et al., 2018; Kalyan et al.,2024).

Clarkson's (1995) categorization of stakeholders into primary and secondary groups further enhances the applicability of Stakeholder Theory to this study. Primary stakeholders, such as investors and employees, directly influence corporate operations and demand transparent reporting on sustainability initiatives. Secondary stakeholders, including NGOs and regulatory bodies, indirectly shape corporate behavior through advocacy and regulatory pressure. In the Indian context, regulatory frameworks like the Business Responsibility and Sustainability Reporting (BRSR) guidelines exemplify the influence of secondary stakeholders in driving standardized sustainability disclosures.

Recent studies further underscore the relevance of Stakeholder Theory in understanding corporate sustainability disclosure. Freeman et al. (2018) argue that this theory is essential for addressing the growing societal expectations that companies engage in social and environmental practices beyond profit maximization. Liou et al. (2023) suggest that meaningful stakeholder engagement enhances a company's legitimacy and competitive advantage, which is critical for long-term sustainability. Similarly, Sehgal et al. (2022) highlight that sustainability disclosures play a crucial role in reinforcing organisational legitimacy by showcasing a company's dedication to environmental, social, and governance (ESG) responsibilities.

While Stakeholder Theory offers a comprehensive framework for analyzing sustainability disclosures, alternative theories such as Institutional Ownership, Resource Dependency Theory (RDT), and Agency Theory are less suited for this study. Institutional Ownership theory focuses on the role of institutional investors in influencing corporate governance decisions, often emphasizing financial performance and shareholder interests (Velte, 2023). In contrast, sustainability disclosure involves a broader array of stakeholders, including employees, customers, and regulators, whose interests extend beyond financial considerations. Similarly, RDT examines organisational power dynamics but does not fully address the ethical and environmental concerns prioritized by stakeholders in sustainability reporting. Agency Theory, while useful for understanding principal-agent relationships, does not adequately explain the broader organisational behavior related to sustainability efforts.

Thus, Stakeholder Theory is the most appropriate theoretical framework for this study, as it allows for a holistic understanding of sustainability disclosures in the Indian manufacturing sector. By examining the varying demands of stakeholders across industries, the study will provide insights into the motivations behind sector-specific reporting practices and the role of stakeholder pressures in shaping these disclosures. This approach ensures that the complexities of sustainability reporting are captured in a meaningful way, enhancing the conceptual clarity and practical relevance of the study.

3. Methodology

This study employed content analysis to assess the extent of sustainability disclosures in the annual reports of Indian companies. Content analysis was chosen because it allows for systematic evaluation of textual data and provides a structured way to identify patterns in sustainability disclosure. Compared to other methodologies, content analysis is particularly effective in assessing unstructured corporate reports and extracting meaningful trends related to sustainability practices (Krippendorff, 2019). In the content analysis process, relevant data was selected from sources such as annual reports. In the content analysis process, relevant data was selected from sources such as annual reports. To ensure accuracy and consistency, a coding scheme was developed to extract relevant details from the data. The measurement unit chosen for coding and analysis was the sentence (line), which is considered more appropriate for analyzing narrative statements and offers greater inter-rater reliability compared to word count (O'Connor & Joffe, 2020). This approach aimed to enhance the stability and accuracy of the analysis.

The coding process was conducted manually to analyze the Business Responsibility and Sustainability Reports (BRSR) of 22 companies listed on the National Stock Exchange (NSE). Manual coding was chosen over automated techniques to ensure nuanced interpretation of qualitative disclosure statements. While automated approaches like Natural Language Processing (NLP) tools can analyze vast datasets efficiently, they often struggle with context-specific language variations present in sustainability reports. Each report was carefully reviewed to identify the sustainability frameworks followed by the companies. Each report was carefully reviewed to identify the sustainability frameworks followed by the companies. A binary coding system was applied to classify the adoption of each framework: companies that followed a particular framework were assigned a value of '1', while those that did not adopt it were assigned a value of '0'. The final coded dataset was structured into a matrix, where companies were represented in rows and sustainability frameworks in columns. This structured dataset facilitated further quantitative analysis of disclosure practices.

To ensure coding reliability, a self-check mechanism was implemented, where the author revisited and re-evaluated the coded data after a two-week interval to ensure consistency. Any discrepancies found during the second review were resolved by refining the coding scheme. Additionally, to enhance validity, the coding framework was cross-checked against recognized sustainability disclosure frameworks, including the Global Reporting Initiative (GRI), National Voluntary Guidelines (NVG), International Integrated Reporting Council (IIRC), and UN Sustainable Development Goals (UNSDGs). Furthermore, an expert validation approach was employed, where two senior researchers specializing in corporate sustainability reporting were consulted. Their feedback helped refine the categorization process and confirm the robustness of the coding methodology.

The descriptive statistics, including the mean, median, standard deviation, highest and lowest values, frequency, and percentage, were used to examine the data collected from the annual reports of 22 Indian manufacturing companies for the fiscal year 2021–2022. These companies were selected based on their market capitalization as of December 30, 2022. Table 1 shows the list of the sampled companies and their market capitalization, which varied in proportion to their sizes and corporate disclosures.

The selection of these 22 companies was justified based on their market capitalization and listing on the National Stock Exchange (NSE), ensuring that the sample consisted of significant players in the Indian economy. By including firms from various sectors, the study aimed to capture the diverse landscape of corporate sustainability disclosure practices in India. The sample includes firms from diverse manufacturing sub-sectors, including heavy industries (e.g., steel and cement), energy, consumer goods, and chemicals. This ensures that the study captures sectoral variations in sustainability disclosure. However, due to the predominance of large-cap firms, the results may not fully reflect the disclosure practices of small and mid-sized enterprises. Compliance with the SEBI (Listing Obligations and Disclosure Requirements) Regulations further reinforced the sample's relevance in promoting transparency and accountability. The sample size was determined to balance the depth of analysis with practical considerations such as resource availability and time constraints. However, while the findings provide valuable insights, they may not fully represent the practices of smaller firms or those across all industries, limiting the generalizability of the results. Future research could benefit from a broader and more diversified sample to provide a more comprehensive understanding of sustainability disclosure in the Indian corporate context.

Table 1 *Sample companies list*

S/N	Symbol	Company Name	Market capitalization as on December 30, 2022 (Rs in Lakhs)
1	RELIANCE	Reliance Industries Limited	172,329,584
2	TCS	Tata Consultancy Services Limited	119,164,326
3	HDFCBANK	HDFC Bank Limited	90,797,943
4	INFY	Infosys Limited	63,466,275
5	ICICIBANK	ICICI Bank Limited	62,149,393
6	HINDUNILVR	Hindustan Unilever Limited	60,174,207
7	SBIN	State Bank of India	54,770,342
8	HDFC	Housing Development Finance Corporation Limited	48,044,948
9	BHARTIARTL	Bharti Airtel Limited	44,854,794
10	ADANIENT	Adani Enterprises Limited	43,985,233
11	LICI	Life Insurance Corporation of India	43,300,934
12	ITC	ITC Limited	41,153,010

13	ATGL	Adani Total Gas Limited	40,614,337
14	BAJFINANCE	Bajaj Finance Limited	39,808,183
15	KOTAKBANK	Kotak Mahindra Bank Limited	36,285,747
16	ADANIGREEN	Adani Green Energy Limited	30,600,339
17	ASIANPAINT	Asian Paints Limited	29,619,069
18	LT	Larsen & Toubro Limited	29,313,085
19	ADANITRANS	Adani Transmission Limited	28,882,894
20	AXISBANK	Axis Bank Limited	28,711,055
21	HCLTECH	HCL Technologies Limited	28,203,121
22	DMART	Avenue Supermarts Limited	26,356,333

Source: *Author's's Computation (2024)*

The focus of the research is on sectoral and industry-specific variations in sustainability disclosure while also considering environmental disclosure. The study primarily examines the elements of sustainability disclosure frameworks and relevant regulations. To analyze the collected data, this study used a quantitative content analysis approach, with annual reports of Indian businesses serving as the primary source of information. The assessors reviewed the reports to ensure accuracy, consistency, and authenticity in the analysis. The study specifically examined the sustainability frameworks followed by Indian companies, including the Global Reporting Initiative (GRI), National Voluntary Guidelines (NVG), International Integrated Reporting Council (IIRC), and UN Sustainable Development Goals (UNSDGs).

Descriptive analysis provides critical insights into the distribution of sustainability disclosures in Indian companies' annual reports. By examining statistical measures such as mean, median, standard deviation, maximum and minimum values, frequency, and percentage distributions, this study offers a comprehensive understanding of the key trends, variability, and disclosure patterns across different sustainability frameworks and environmental reporting standards.

4. Data Analysis and Findings

This study examines the degree to which Indian corporations embrace industry-specific variations and sectoral differences in sustainability disclosure reporting frameworks and guidelines in their annual reports. The statistical analysis, including mean, median, standard deviation, and the minimum and maximum values for each framework, allows for a comprehensive understanding of how different sustainability frameworks are being adopted by Indian companies. The results in Table 2 highlight both the level of adoption and the variance in how these frameworks are integrated into corporate disclosures.

Table 2 *Sustainability reporting frameworks in indian corporations: adoption and analysis*

Reporting framework and guidelines	Mean	Median	Std. Deviation	Minimum	Maximum
GRI	0.77	1.00	0.43	0.00	1.00
NVG	0.18	0.00	0.40	0.00	1.00
IIRC	0.59	1.00	0.50	0.00	1.00
UN SDGs	0.32	0.00	0.48	0.00	1.00
API/IPIECA	0.05	0.00	0.21	0.00	1.00
BRSR -SEBI	0.45	0.00	0.51	0.00	1.00
TCFD	0.36	0.00	0.49	0.00	1.00
WEF-IBC	0.05	0.00	0.21	0.00	1.00
SASB	0.14	0.00	0.35	0.00	1.00
WEF-ESG	0.09	0.00	0.29	0.00	1.00
IBBI	0.09	0.00	0.29	0.00	1.00
UNGC Principles	0.05	0.00	0.21	0.00	1.00
CDP	0.05	0.00	0.21	0.00	1.00

| S&P Global | 0.05 | 0.00 | 0.21 | 0.00 | 1.00 |
| NGRBCs | 0.14 | 0.00 | 0.35 | 0.00 | 1.00 |

Source: *Researcher's Computation (2024)*

In this study, SPSS was used to assess the frameworks and guidelines created by the UN SDGs, IIRC, NVG, and GRI. Regarding the level of sustainability disclosure associated with any framework or guideline, descriptive statistics offer useful information.

The analysis reveals significant variation in the adoption of different sustainability frameworks. For example, the GRI framework is the most widely adopted, with a mean score of 0.77 and a median of 1.00, indicating that a majority of the companies (77%) report using this framework, and the compliance across organisations is strong. The standard deviation of 0.43 suggests moderate variability in adoption among firms, meaning that while most companies follow GRI, there are some that may not have fully embraced it. The maximum score of 1.00 and the minimum of 0.00 indicate that some companies fully comply with GRI, while others do not report at all.

In contrast, the NVG framework has much lower adoption, with a mean of 0.18 and a median of 0.00, highlighting that only a few companies incorporate this framework in their sustainability disclosures. The standard deviation of 0.40 indicates substantial variance in adoption, where some companies report using the framework, while others do not report it at all. This discrepancy suggests that NVG is not as widely recognized or applied as some other frameworks, like GRI.

The IIRC framework shows moderate adoption with a mean score of 0.59 and a median of 1.00. While some companies (59%) report using the IIRC framework, there is also substantial variation in its implementation, as indicated by the standard deviation of 0.50. This suggests that companies' sustainability practices differ significantly, and some may adopt certain aspects of the framework while others fully integrate it.

The UN SDGs framework has a mean of 0.32 and a median of 0.00, indicating that many companies have yet to explicitly integrate the SDGs into their sustainability reporting. The standard deviation of 0.48 suggests that when companies do report on the SDGs, they may do so inconsistently or at varying levels of depth.

Other frameworks like API/IPIECA, TCFD, SASB, and WEF-IBC show low mean values, ranging from 0.05 to 0.14. This indicates minimal usage of these frameworks, with few companies adopting them for their sustainability disclosures. The standard deviations for these frameworks are relatively low, showing that companies either do not adopt these frameworks at all or report very little regarding them.

Notably, the BRSR-SEBI framework has a mean score of 0.45. This suggests that a moderate number of companies are adopting the BRSR framework, and it aligns with Indian regulatory requirements, meaning it could become more widely adopted in the future, especially as stakeholders and regulators continue to emphasise its importance.

The findings regarding frameworks like CDP, S&P Global, and NGRBCs, which all have low mean scores of 0.05, point to minimal engagement by companies in aligning their reporting with these frameworks. The minimum values of 0.00 and maximum of 1.00 indicate a wide variance in adoption, suggesting that while most companies do not report on these frameworks, a few may fully comply. One limitation in analyzing sustainability disclosure frameworks is the reliance on self-reported data, as the adoption of these frameworks is often voluntary. Companies may selectively disclose information to boost their corporate image or meet stakeholder expectations, which introduces the potential for greenwashing. This bias may result in an overrepresentation of positive sustainability efforts while underreporting less favorable practices. To address this potential bias in future research, it is suggested that third-party ESG ratings or independent sustainability audits (Boiral, 2016) be incorporated. These external validations could help provide a more objective and accurate picture of companies' true sustainability efforts and their alignment with industry-specific reporting frameworks. The next section of the analysis was concerned with sectoral differences in the sustainability reporting frameworks used by Indian companies.

4.1 Industry-Specific Sustainability Framework Adoption in Indian Companies

In the sample of 22 major Indian companies analyzed, the globally recognized frameworks GRI (Global Reporting Initiative), IIRC (Integrated Reporting framework), and BRSR-SEBI (Business Responsibility and Sustainability Reporting, as mandated by SEBI) are the most widely adopted. However, their usage varies by industry sector. Table 3 summarizes the sustainability frameworks commonly used in each industry sector based on the research findings.

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Table 3 *Sector-wise use of major sustainability reporting frameworks*

Industry Sector	GRI	IIRC	BRSR-SEBI
Steel (Heavy Industry)	✓	✕	✓
Cement (Heavy Industry)	✓	✕	✓
Chemicals (Heavy Industry)	✓	✕	✓
IT (Knowledge Industry)	✕	✓	✓
Financial Services (Knowledge Industry)	✕	✓	✓

Source: Author''s Compilation (2024)

Key: ✓ = framework is used commonly in that sector's reporting

As shown in Table 3, heavy industries adopted environmental frameworks (GRI, BRSR) and thus do not commonly emphasise the IIRC integrated reporting framework in their sustainability reports. Conversely, knowledge-based sectors favour integrated reporting of ESG information; many IT/financial companies produce integrated reports (IIRC) highlighting governance and social factors. While service-sector firms still may use GRI standards to some extent, the data indicates that this framework reporting is not a primary focus for IT/financial companies' sustainability disclosure (their reports tend to stress social and governance topics over environmental metrics). These firms are more likely to produce integrated reports (aligning with the IIRC framework) that highlight social and governance aspects (employee welfare, diversity, ethics) alongside financial performance.

The findings suggest that the GRI and BRSR-SEBI frameworks reporting is prevalent in environmentally intensive sectors (steel, cement, chemicals) due to regulatory pressure and stakeholder scrutiny on environmental performance. In contrast, integrated reporting (IIRC) and governance-focused disclosures are more prominent in the IT and financial sectors, aligning with those industries' focus on social responsibility and governance issues over environmental impact.

Consequently, the analysis of 22 companies shows that while GRI, IIRC, and BRSR are the dominant frameworks across Indian firms, their uptake is industry-dependent, with heavy industries leading on environment-centric reporting and service sectors leading on integrated ESG reporting.

5. Discussion of Findings

This study offers valuable insights into the sustainability disclosure practices of Indian manufacturing companies, highlighting notable industry-specific and sectoral variations. The findings suggest that Indian companies, particularly in the manufacturing sector, are more likely to adopt sustainability reporting frameworks that are widely recognized and mandated by regulatory bodies. Frameworks like GRI, IIRC, and BRSR-SEBI exhibit higher levels of adoption, which could be attributed to external pressures such as regulatory requirements, stakeholder demands, and the increasing importance of transparency and accountability in sustainability reporting. The widespread adoption of these frameworks indicates that companies in the manufacturing sector are aligning with global and national standards to meet both compliance expectations and the growing demand for sustainability information from investors, consumers, and other stakeholders.

Compared to global standards, Indian firms exhibit a strong preference for GRI and SEBI-BRSR, reflecting regulatory alignment. However, the adoption of frameworks like SASB and TCFD remains low, contrasting with Western markets where investor-driven ESG reporting is more prominent (Ioannou & Serafeim, 2017). This difference highlights the global divergence in sustainability reporting practices, with Western markets leading the charge in climate risk disclosures and industry-specific reporting frameworks. Indian companies, by comparison, seem to be more focused on complying with regulatory expectations rather than responding to investor-driven ESG demands.

Heavy industries (e.g., steel, cement, and chemicals) demonstrate a higher tendency to adopt GRI and SEBI-BRSR frameworks due to stringent environmental regulations and high carbon footprints. Conversely, knowledge-based industries such as IT and financial services prioritize governance and social responsibility disclosures over environmental concerns (Thassim, 2025; Kanoo et al., 2024). This sectoral difference further reflects the varying pressures and expectations faced by different industries in adopting sustainability reporting frameworks. The findings underscore the importance of industry-specific considerations in sustainability reporting, where some sectors, particularly those with significant environmental impacts, are under more intense regulatory and stakeholder scrutiny, thus driving greater adoption of environmental frameworks

In contrast, frameworks like NVG, UN SDGs, SASB, and API/IPIECA are less commonly adopted, suggesting that many companies in the manufacturing sector have yet to fully integrate these frameworks into their reporting practices. This could be due to several factors, including a lack of awareness, limited understanding, and

insufficient incentives to adopt these frameworks. For instance, while UN SDGs represent important global goals, their adoption within the manufacturing sector appears to be hindered by a lack of clarity on how these goals align with specific business practices. Similarly, SASB and API/IPIECA have lower adoption rates, which may reflect the absence of industry-specific guidance or pressure from stakeholders to report on these frameworks.

The variability in adoption across frameworks suggests that sustainability reporting is still in its developmental stages within Indian companies. While frameworks like GRI and IIRC are more widely implemented, the inconsistent application of these frameworks across organisations indicates that many companies are still navigating the process of integrating sustainability reporting into their operations. This lack of uniformity underscores the need for greater guidance and standardization in the implementation of sustainability reporting frameworks, particularly in sectors where adoption rates are lower.

Moreover, the findings highlight an emphasis on environmental disclosures such as carbon reduction, energy use, and waste management, which are particularly prominent in the manufacturing sector. This suggests that companies are beginning to recognize the importance of environmental sustainability and the impact of their operations on the environment. However, there is still room for improvement in the verification and external validation of these reports, as many disclosures lack independent third-party verification, which would enhance the credibility and reliability of the information being reported.

The findings also point to the need for more comprehensive adoption of sustainability frameworks, particularly those that are not yet widely used but could provide significant value to both companies and stakeholders in the long term. For instance, the low uptake of UN SDGs could be addressed through increased awareness and capacity-building initiatives to help companies understand how these global goals can be integrated into their sustainability strategies. Similarly, frameworks like SASB could benefit from more industry-specific guidance to encourage adoption among manufacturing companies.

The findings suggest that regulatory intervention plays a critical role in shaping sustainability disclosure. Policymakers could enhance disclosure consistency by mandating standardised reporting under a unified framework, integrating global best practices such as TCFD for climate risk assessment. The growing importance of environmental, social, and governance (ESG) factors in global business practices indicates the need for greater alignment between Indian regulations and international standards. Strengthening regulations and providing clearer guidelines would ensure that companies across various sectors are incentivized to improve transparency, consistency, and comparability in their sustainability reporting.

A consistent high level of reporting on issues such as carbon reduction, greenhouse gas emissions, energy use, waste disposal, resource conservation, and related goals/programs is found in studies on environmental disclosure. However, due to inadequate external qualification or honors verification, there is room for improvement. These findings support the idea that there are profound industry-specific variations and sectoral differences in sustainability disclosure among the Indian manufacturing companies. An implication of this finding is the necessity of uniform reporting procedures and greater openness across all sectors to advance sustainability and satisfy stakeholder expectations.

6. Conclusion and Recommendations

This study aimed to analyze industry-specific variations and sectoral differences in sustainability disclosure practices among Indian manufacturing companies. By examining the adoption of various sustainability reporting frameworks, the research sought to understand how different industries within the manufacturing sector approach environmental, social, and governance (ESG) disclosures. The findings reveal significant variations in the adoption of sustainability frameworks, with globally recognized and regulatory-mandated frameworks such as the Global Reporting Initiative (GRI), International Integrated Reporting Council (IIRC), and Business Responsibility and Sustainability Reporting (BRSR-SEBI) being more widely adopted. In contrast, frameworks like the National Voluntary Guidelines (NVG), UN Sustainable Development Goals (SDGs), and Task Force on Climate-related Financial Disclosures (TCFD) show lower adoption rates, indicating a need for greater awareness and integration of these frameworks into corporate reporting practices.

The study highlights those heavy industries, such as steel, cement, and chemicals, tend to adopt environmental-focused frameworks like GRI and BRSR-SEBI due to stringent regulatory pressures and high environmental footprints. In contrast, knowledge-based industries, such as IT and financial services, prioritize governance and social responsibility disclosures. These sectoral differences underscore the influence of industry-specific challenges and stakeholder expectations on sustainability reporting practices. The findings also reveal that while Indian companies are increasingly aligning with global and national standards, there is still a lack of uniformity and consistency in the application of these frameworks, particularly in sectors with lower adoption rates.

This study contributes to the growing body of literature on sustainability reporting by providing a detailed analysis of industry-specific variations in sustainability disclosures within the Indian manufacturing sector. The findings emphasise the role of regulatory pressures and stakeholder demands in shaping sustainability reporting practices, particularly in a developing economy like India. By highlighting the varying adoption rates of global and

national frameworks, the study offers insights into the factors that influence sustainability reporting, such as regulatory compliance, industry-specific challenges, and stakeholder expectations. Furthermore, the research underscores the need for greater alignment between Indian reporting practices and global sustainability goals, such as the UN SDGs, to ensure that corporate disclosures contribute meaningfully to broader environmental and social objectives.

While this study provides valuable insights, it is not without limitations. First, the sample size was limited to 22 large-cap manufacturing companies listed on the National Stock Exchange (NSE), which may not fully represent the practices of small and mid-sized enterprises (SMEs) or companies across all industries. Second, the reliance on self-reported data from annual reports introduces the potential for greenwashing, as companies may selectively disclose information to enhance their corporate image. Third, the study focuses on a single fiscal year (2021–2022), which limits the ability to track changes in sustainability reporting practices over time. Future research could address these limitations by including a broader and more diversified sample, incorporating third-party ESG ratings, and conducting longitudinal studies to assess the evolution of sustainability reporting practices.

To build on the findings of this study, future research could explore several avenues. First, mixed-method approaches, combining quantitative analysis with qualitative interviews, could provide deeper insights into the motivations and challenges companies face in adopting sustainability frameworks. Second, future studies could investigate the impact of sustainability reporting on financial performance and stakeholder trust, establishing a clearer link between sustainability disclosures and business outcomes. Third, research could include SMEs to provide a more comprehensive understanding of sustainability reporting practices across the Indian corporate landscape. Fourth, longitudinal studies could track the evolution of sustainability reporting practices over time, particularly in response to regulatory changes such as the introduction of BRSR guidelines. Finally, comparative studies between India and other emerging economies could shed light on the role of cultural, regulatory, and economic factors in shaping sustainability reporting practices.

Based on the findings, several recommendations can be proposed to enhance sustainability reporting practices in India. First, policymakers should consider mandating the use of standardized frameworks like GRI and BRSR-SEBI while also encouraging the adoption of less-utilised frameworks such as NVG and UN SDGs. This could be achieved through a phased implementation approach, starting with voluntary adoption and gradually moving towards mandatory compliance. Second, capacity-building initiatives, such as training programs, workshops, and industry-specific guidelines, should be introduced to help companies better understand and implement sustainability frameworks. Third, incentivization mechanisms, such as tax benefits or recognition programs, could be introduced to reward companies that demonstrate excellence in sustainability reporting. Fourth, to enhance the credibility of sustainability reports, companies should be encouraged to seek third-party verification of their disclosures. This would not only improve the reliability of the information but also build stakeholder trust. Finally, sector-specific guidelines should be developed to address the unique challenges and opportunities faced by different industries. For example, heavy industries like steel and cement could focus on environmental disclosures, while IT and financial services could emphasise social and governance aspects.

In conclusion, this study highlights the growing importance of sustainability reporting in the Indian manufacturing sector and underscores the need for greater standardization, transparency, and alignment with global sustainability goals. By addressing the gaps identified in this research, Indian companies can enhance their sustainability disclosures, contributing to broader environmental and social objectives while meeting stakeholder expectations.

7. Contribution to Knowledge and Suggestions for Further Studies

This study contributes to the growing body of literature on sustainability reporting by providing a detailed analysis of industry-specific variations and sectoral differences in sustainability disclosures among Indian manufacturing companies. It highlights the varying adoption rates of global and national frameworks, offering insights into the factors that influence these practices. The study also underscores the role of regulatory pressures and stakeholder demands in shaping sustainability reporting, particularly in a developing economy context. By focusing on the manufacturing sector, the study fills a gap in understanding how industry-specific challenges and opportunities influence sustainability disclosure practices. Furthermore, the findings emphasise the need for greater alignment between Indian reporting practices and global sustainability goals, such as the UN SDGs, to ensure that corporate disclosures contribute meaningfully to broader environmental and social objectives.

Future research can build on these findings by exploring several avenues. First, mixed-method approaches, combining quantitative analysis with qualitative interviews, could be employed to gain a deeper understanding of the motivations and challenges companies face in adopting sustainability frameworks. This would provide richer insights into the barriers to adoption and potential solutions. Second, future studies could explore the impact of sustainability reporting on financial performance and stakeholder trust. Establishing a clearer link between sustainability disclosures and business outcomes would provide a stronger rationale for companies to invest in comprehensive reporting. Third, while this study focuses on large-cap manufacturing companies, future research could include small and mid-sized enterprises (SMEs) to provide a more comprehensive understanding of

sustainability reporting practices across the Indian corporate landscape. Fourth, longitudinal studies could track the evolution of sustainability reporting practices over time, particularly in response to regulatory changes such as the introduction of BRSR guidelines. This would provide valuable insights into the effectiveness of these measures in driving adoption. Fifth, comparative studies between India and other emerging economies could shed light on the role of cultural, regulatory, and economic factors in shaping sustainability reporting practices. This would help identify best practices that could be adapted to the Indian context. Finally, future research could explore the role of technology, such as blockchain and AI, in enhancing the transparency and reliability of sustainability disclosures. This could also include the use of automated tools for data collection and analysis, reducing the burden on companies. By addressing these areas, future research can build on the findings of this study, contributing to a more nuanced understanding of sustainability reporting practices and their implications for corporate governance and stakeholder engagement.

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Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of the paper.

Author Contributions

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

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