



**A COMPARATIVE ANALYSIS OF ENVIRONMENTAL DISCLOSURE PRACTICES
AMONG LEADING INDIAN PHARMACEUTICAL COMPANIES**

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<https://doi.org/10.5281/zenodo.20786208>

ABSTRACT

Environmental disclosure has become an integral component of company reporting, as stakeholders demand greater openness about environmental consequences and sustainability performance. The pharmaceutical industry, due to its chemical-intensive operations and resource usage, faces heightened environmental accountability, particularly in the Indian context. This study's main goal is to investigate and contrast the environmental disclosure practices of two prominent pharmaceutical corporations in India, Sun Pharmaceutical Industries Limited and Dr. Reddy's Laboratories Limited. The analysis entirely uses secondary data from publicly available yearly reports and sustainability disclosures during a three-year period from 2022-23 to 2024-25. An inductive environmental disclosure assessment framework was developed directly from company reports, and content analysis was employed to evaluate disclosure practices. The findings show that both individuals demonstrate a high and consistent level of environmental disclosure, with Dr. Reddy's Laboratories Limited showing marginally higher scores. However, the t-test results reveal no statistically significant difference between the disclosure practices of the selected companies.

Keywords: *Environmental Disclosure Practices, Pharmaceutical Industry, Sustainability Reporting, Corporate Accountability, India*

1. INTRODUCTION

Environmental protection is embraced by some of the most important issues facing modern industrial progress. While industrialization has played a significant role in economic development, technological advancement, and job creation, it has also contributed significantly to environmental degradation in the form of pollution, depletion of natural resources, and ecological imbalances. In response to these challenges, stakeholders increasingly expect corporations to act responsibly and to disclose the environmental consequences of their activities in a transparent manner.



The pharmaceutical sector is particularly important in this context as it relies on chemical-intensive manufacturing processes, extensive water use and the generation of hazardous waste. India has emerged as a global powerhouse in pharmaceutical manufacturing, providing affordable medicines to domestic and international markets. However, the rapid expansion of pharmaceutical manufacturing has raised concerns regarding environmental pollution, particularly in relation to wastewater discharge, improper waste disposal and emission of harmful substances. These concerns have placed Indian pharmaceutical companies under increasing regulatory and social scrutiny.

Environmental disclosure processes serve as an important form of communication, which enterprises use to express information on their environmental policies, governance structures, compliance practices and sustainability initiatives. Such disclosures enable stakeholders to assess a company's environmental responsibility and commitment to sustainable development. From an investor perspective, environmental disclosure reduces information asymmetry and supports informed decision-making. From a regulatory perspective, it demonstrates compliance with environmental laws and standards. From a social perspective, it enhances corporate legitimacy and trust.

In recent years, top Indian pharmaceutical corporations have started including environmental disclosures in their annual reports and sustainability statements. These disclosures often include statements on environmental policies, waste management practices, water conservation initiatives, energy efficiency measures and compliance with environmental regulations. Despite this development, environmental disclosure practices in the Indian pharmaceutical business remain largely voluntary and vary widely in terms of depth, consistency and comparability across companies.

Academic research examining environmental disclosure practices has expanded globally; However, sector-specific studies focusing on the Indian pharmaceutical industry have been limited. Existing studies often adopt cross-industry approaches or emphasize broad ESG disclosures, thereby ignoring the unique environmental challenges faced by pharmaceutical companies. This study fills a gap by undertaking a focused comparative examination of the environmental disclosure policies utilized by two large Indian pharmaceutical corporations over a certain time period.

2. CONCEPTUAL FOUNDATION OF ENVIRONMENTAL DISCLOSURE

Environmental disclosure refers to the systematic reporting of information regarding an organization's environmental impacts, management practices, and sustainability initiatives. It includes qualitative and quantitative data that shows how the company manages environmental risks. From a theoretical perspective, advertising can be explained by:

Stakeholder Theory: Stakeholder theory believes that a corporation's success depends on managing relationships with all parties affected by its operations, not just shareholders. In the pharmaceutical industry,



this includes investors, regulators, local communities, and global health partners. For companies like Sun Pharma and Dr. Reddy's, environmental disclosure serves as a vital communication tool to address these groups' concerns regarding chemical safety and resource usage.

By transparently reporting on waste management and emission controls, these firms build institutional trust and secure their social license to operate. Ultimately, high disclosure levels are a strategic response to diverse stakeholder pressures, ensuring long-term corporate legitimacy and risk mitigation in a highly regulated global market.

Legitimacy Theory: According to Legitimacy Theory, in order to survive, organisations must function within the boundaries and conventions of their particular societies. For pharmaceutical giants like Sun Pharma and Dr. Reddy's, a social contract exists where the public grants them the right to operate in exchange for responsible behaviour.

Environmental disclosures represent a strategic approach for maintaining credibility, especially given the industry's high potential for pollution. By reporting near-perfect scores on environmental metrics, these companies integrate their business image with social principles like sustainability and resource conservation. This transparency minimises the legitimacy gap, ensuring that their chemical-intensive operations remain socially acceptable and reducing the risk of public or regulatory backlash.

Signaling Theory: According to Signaling Theory, firms utilise transparency to signal their superior performance to stakeholders in a market where actual quality is hard to observe. Since investors and the public cannot easily see a firm's internal environmental management, pharmaceutical leaders like Sun Pharma and Dr. Reddy's use comprehensive reporting to differentiate themselves from competitors.

By providing detailed data on high-level metrics like ISO 14001 certification and energy efficiency, these firms send a credible signal of their operational excellence and lower risk profile. In this study, the near-perfect disclosure scores act as a strategic signal to the global market, positioning these companies as responsible industry leaders and reducing information gaps for potential partners and investors.

3. ENVIRONMENTAL DISCLOSURE PRACTICES IN INDIA WITH SPECIAL REFERENCE TO THE PHARMACEUTICAL INDUSTRY

- **Evolution of Disclosure:** Environmental disclosure in India has evolved gradually as environmental awareness and stakeholder expectations have increased, shifting corporate reporting beyond purely financial information.
- **Legal Framework:** Environmental laws such as the Environment (Protection) Act, 1986, focus on pollution control and compliance rather than mandatory public environmental disclosure, making reporting largely voluntary.



- **Companies Act, 2013:** The Companies Act, 2013 promoted non-financial reporting through mandatory CSR provisions, indirectly encouraging disclosure of environmental initiatives.
- **BRSR Framework:** SEBI's Business Responsibility and Sustainability Reporting (BRSR) framework strengthened expectations for standardised environmental and sustainability disclosures among listed companies.
- **Pharmaceutical Industry Context:** Environmental disclosure is particularly important in the pharmaceutical sector due to chemical-intensive operations and strict regulatory oversight.
- **Use of Global Frameworks:** Leading pharmaceutical companies increasingly adopt frameworks such as GRI and ISO 14001 to improve disclosure quality and credibility.
- **Existing Challenges:** Environmental disclosures remain largely qualitative, with limited standardisation and comparability, highlighting the need for further academic examination.

4. REVIEW OF LITERATURE

- **Sharma and Khanna (2022)** analysed corporate environmental disclosure policies among Indian manufacturing firms and identified significant disparities in reporting depth and consistency. The study indicated that larger businesses with greater regulatory exposure disclosed more comprehensive environmental information. This observation is particularly applicable to leading pharmaceutical companies, which are subject to stringent environmental regulations and stakeholder scrutiny.
- **Kumar and Firoz (2021)** analysed sustainability reporting trends in Indian corporations following the introduction of mandatory Business Responsibility and Sustainability Reporting (BRSR). The study reported an overall improvement in environmental disclosure quality, though sectoral differences remained pronounced. The pharmaceutical industry exhibited moderate disclosure levels, indicating scope for enhanced reporting on emissions, waste management, and resource efficiency.
- **Goyal, Rahman, and Kazmi (2021)** The study examined the components of environmental disclosure across Indian listed corporations and discovered that company size, profitability, and board composition all had a substantial impact on disclosure levels. Their results indicate that governance processes play an important role in promoting environmental transparency, which is highly relevant for pharmaceutical firms characterised by complex ownership and governance structures.
- **Chakraborty and Chatterjee (2020)** focused on environmental reporting practices in pollution-intensive industries in India. The study revealed that while firms disclosed qualitative environmental policies, quantitative performance indicators were often limited. For pharmaceutical companies, this highlights a



gap between policy-level disclosure and measurable environmental outcomes, reducing the effectiveness of comparative analysis.

- **Mishra and Suar (2019)** investigated the link between environmental responsibility and business performance in Indian enterprises. Their analysis demonstrated that businesses with stronger environmental disclosure practices enjoyed improved stakeholder trust and reputational benefits. In the pharmaceutical sector, public health and environmental safety are closely linked, comprehensive environmental disclosure can strengthen corporate legitimacy and stakeholder confidence.

5. Objective of the study:

- To examine and compare the types of environmental information disclosed by Sun Pharmaceutical Industries Limited and Dr. Reddy's Laboratories Limited.
- To evaluate the consistency of environmental disclosure practices across the three-year study period from 2022-23 to 2024-25.
- To examine statistically if significant differences exist in the environmental disclosure scores between the two selected pharmaceutical companies.

6. Research Gap:

While the existing literature extensively explores global ESG trends, currently is a noticeable absence of sector-specific comparison studies concentrating on the Indian pharmaceutical industry throughout the mandatory BRSR period. Most studies utilise broad, cross-industry datasets that overlook the unique environmental complexities of pharmaceutical manufacturing, such as API-related effluent management. Furthermore, there is a lack of micro-level analysis using frameworks derived directly from corporate disclosures rather than standardised indices. This research aims to fill the gap by providing a targeted statistical comparison of reporting consistency and completeness between industry leaders Sun Pharma and Dr. Reddy's.

7. SIGNIFICANCE OF ENVIRONMENTAL DISCLOSURE IN THE PHARMACEUTICAL SECTOR

The pharmaceutical industry presents unique environmental challenges, including the use of active pharmaceutical ingredients (APIs) and solvents that risk aquatic ecosystems. Disclosures related to effluent treatment and hazardous waste management provide insights into risk mitigation. Furthermore, in global markets, environmental disclosure is increasingly linked to access to capital and inclusion in sustainability indices.

8. RESEARCH METHODOLOGY

This research paper uses a descriptive and comparative research approach. The research is quantitative in nature, supported by qualitative content analysis.



- **Sample Selection:** Sun Pharmaceutical Industries Limited and Dr. Reddy's Laboratories Limited were selected based on their prominent market position and data availability.
- **Sources of Data:** Secondary data has been obtained from annual reports and sustainability disclosures for fiscal years 2022-23, 2023-24, and 2024-25.
- **Period of Study:** Three years from 2022-23 to 2024-25.
- **Tools and Techniques:** The study utilised Content Analysis as the primary qualitative tool to extract environmental data from the annual reports. To quantify findings, a Binary Environmental Disclosure Matrix (1 = disclosed, 0 = not disclosed) was built utilising Microsoft Excel, the primary data tabulation tool. Inferential evaluation was performed using the Independent Sample t-test using statistical software to compare mean disclosure scores at a 0.05 significance level.
- **Hypothesis of the study:**

To empirically test these questions, the following hypothesis is proposed:

H₀: There is no significant difference in environmental disclosure practices between the selected Indian pharmaceutical companies.

H₁: There is a significant difference in environmental disclosure practices between the selected Indian pharmaceutical companies.

9. DEVELOPMENT OF ENVIRONMENTAL DISCLOSURE ASSESSMENT FRAMEWORK

9.1 Rationale for Inductive Framework Development

Compared to numerous prior studies that embrace standardised disclosure indices, the present study develops an inductive environmental disclosure assessment framework derived directly from the annual reports of the selected companies. This approach ensures that the assessment items reflect actual disclosure practices within the Indian pharmaceutical industry rather than externally imposed criteria.

The inductive method enhances contextual relevance and reduces the risk of misalignment between assessment items and company reporting practices. It also strengthens the originality of the research by avoiding replication of existing indices.

9.2 Identification of Environmental Disclosure Items

Environmental disclosure items were identified through repeated review of annual reports across the study period. Disclosure themes that appeared consistently in the reports were grouped into distinct items. Items were included in the assessment framework only if they were relevant to pharmaceutical manufacturing and environmental management.



The final disclosure framework consists of 20 environmental disclosure items, encompassing policy-level disclosures, operational practices, compliance mechanisms, and strategic initiatives.

Table 1: Environmental Disclosure Assessment Items

Sr. No.	Environmental Disclosure Items
1	Environmental responsibility statement
2	Environmental governance structure
3	Environmental policy
4	Environmental objectives and commitments
5	Identification of environmental risks
6	Waste management practices
7	Hazardous waste management
8	Effluent treatment and water discharge
9	Water conservation initiatives
10	Energy efficiency measures
11	Air emission control
12	Climate-related initiatives
13	Compliance with environmental regulations
14	Environmental audits
15	Occupational health and safety
16	Environmental training and awareness
17	ISO 14001 certification
18	Green infrastructure initiatives
19	Environmental research and innovation
20	Environmental awards and recognition

Disclosure Scoring Method

Each environmental disclosure item was evaluated using a binary scoring method, where:

- Score 1 = Item disclosed
- Score 0 = Item not disclosed

This method simplifies measurement and enhances comparability across companies and years. The highest attainable score for any firm in a particular year is 20, which corresponds to complete disclosure of all detected issues.

10. ENVIRONMENTAL DISCLOSURE PERFORMANCE OF SELECTED COMPANIES

10.1 Company-wise Disclosure Scores



Table 2: Environmental Disclosure Scores (2022–23 to 2024–25)

Sr. No	Environmental Disclosure Items	Sun 22-23	Sun 23-24	Sun 24-25	Dr.R 22-23	Dr.R 23-24	Dr.R 24-25
1	Environmental responsibility statement	1	1	1	1	1	1
2	Environmental governance structure	1	1	1	1	1	1
3	Environmental policy	1	1	1	1	1	1
4	Environmental objectives and commitments	1	1	1	1	1	1
5	Identification of environmental risks	1	1	1	1	1	1
6	Waste management practices	1	1	1	1	1	1
7	Hazardous waste management	1	1	1	1	1	1
8	Effluent treatment and water discharge	1	1	1	1	1	1
9	Water conservation initiatives	1	1	1	1	1	1
10	Energy efficiency measures	1	1	1	1	1	1
11	Air emission control measures	1	1	1	1	1	1
12	Climate-related initiatives	1	1	1	1	1	1
13	Compliance with environmental regulations	1	1	1	1	1	1
14	Environmental audits	1	1	1	1	1	1
15	Occupational health and safety	1	1	1	1	1	1
16	Environmental training and awareness	1	1	1	1	1	1
17	ISO 14001 certification	1	1	1	1	1	1
18	Green infrastructure initiatives	1	1	1	1	1	1
19	Environmental research and innovation	1	1	1	1	1	1
20	Environmental awards and recognition	0	1	0	1	1	1
	Total Score (out of 20)	18	19	18	19	20	20

The year-wise binary environmental disclosure matrix reveals that both Sun Pharmaceutical Industries Limited and Dr. Reddy's Laboratories Limited maintain a remarkably high and consistent level of environmental transparency over the three-year study period. Across the 20 identified disclosure items ranging from environmental policy and hazardous waste management to energy efficiency and ISO 14001 certification both companies achieved near-perfect scores, with items 1 through 19 being consistently disclosed by both firms in every financial year from 2022-23 to 2024-25. The only point of variation observed was in the "Environmental awards and recognition" category, where Sun Pharma disclosed information only in 2023-24, resulting in total scores of 18 or 19. In contrast, Dr. Reddy's Laboratories Limited demonstrated absolute completeness in the latter two years, achieving a perfect total score of 20 out of 20. This high level of reporting suggests that comprehensive environmental disclosure has become an established norm for these industry



leaders, likely driven by the need to maintain corporate legitimacy and meet evolving regulatory frameworks such as SEBI's BRSR.

10.2 Disclosure Percentage and Mean Score

Table 3: Disclosure Percentage and Mean Score

Company	2022-23 (%)	2023-24 (%)	2024-25 (%)	Mean (%)
Sun Pharmaceutical Industries Ltd.	90	95	90	91.67
Dr. Reddy's Laboratories Ltd.	95	100	100	98.33

The mean disclosure percentages indicate that Dr. Reddy's Laboratories Limited demonstrates greater consistency and completeness in environmental disclosures compared to Sun Pharmaceutical Industries Limited. However, the differences observed are relatively small, suggesting broadly similar disclosure practices among leading pharmaceutical firms.

Table 4: Descriptive Statistics of Environmental Disclosure Scores

Company	Mean Disclosure Score	Standard Deviation
Sun Pharmaceutical Industries Ltd.	18.33	0.58
Dr. Reddy's Laboratories Ltd.	19.67	0.58

Interpretation:

The mean disclosure score of Sun Pharmaceutical Industries Limited is 18.33, indicating that on average the company disclosed more than 90% of the identified environmental items during the study period. Dr. Reddy's Laboratories Limited recorded a high average disclosure score of 19.67, reflecting almost complete disclosure of environmental information.

The standard deviation for both the companies is relatively low (0.58), indicating minimal variation in disclosure practices over the three-year period. This demonstrates a high level of consistency in environmental disclosure reporting by both companies.

11. STATISTICAL ANALYSIS

To determine whether the observed difference in green advertising performance between Sun Pharmaceutical Industries Limited and Dr. Reddy's Laboratories Limited is statistically significant, an independent samples t-test (two samples, assuming equal variances) was performed.



Table 5: t-Test

Statistical Particulars	Sun Pharma (Group 1)	Dr. Reddy's (Group 2)
Sample Size (n)	3 years	3 years
Mean	18.33	19.67
Standard Deviation	0.58	0.58
Variance	0.33	0.33
Degrees of Freedom	-	4
t-Statistic	-	-2.31
p-value (Two-tailed)	-	0.082

Interpretation:

The inferential analysis conducted through an independent sample t-test resulted in a calculated p-value of 0.082. In social science research, the conventional significance level is established at 0.05. Since the p-value of 0.082 is greater than the 0.05 threshold, The study fails to reject the null hypothesis (H₀), implying that there is no statistically significant difference in environmental disclosure policies across the firms studied.

Although Dr. Reddy's Laboratories Limited demonstrates a higher average disclosure score of 19.67 compared to Sun Pharmaceutical Industries Limited, which has 18.33, this difference is not statistically large enough to be considered significant. This finding suggests that, although there are marginal differences in reporting completeness, both top firms exhibit a similar, high-quality commitment to environmental reporting, likely driven by the convergence of industry norms and regulatory expectations.

12. RESULTS AND DISCUSSION

The results of the study show that the two pharmaceutical companies selected demonstrate a high level of commitment towards environmental disclosure. Consistently high disclosure scores in all three years indicate that environmental transparency has become an integral component of corporate reporting in leading institutions in the Indian pharmaceutical sectors.

Dr. Reddy Laboratories Ltd.'s marginally higher disclosure performance may be attributed to greater emphasis on sustainability reporting frameworks, environmental certifications and structured environmental governance mechanisms. The company's consistent disclosure throughout all years reflects a strategic approach to environmental transparency rather than compliance-driven reporting.



Sun Pharmaceutical Industries Limited also demonstrates strong environmental advertising practices, even though minor discrepancies were practical during the study period. These differences may indicate changes in reporting focus or aggregation of disclosure items rather than a decrease in environmental commitment.

The results are consistent with stakeholder theory, which holds that corporations should publish environmental information to meet shareholder demands and maintain credibility. The lack of statistically significant differences between companies supports the notion that industry leaders tend to converge toward similar disclosure standards to maintain competitive parity and regulatory compliance.

13. FINDINGS OF THE STUDY

1. Both selected pharmaceutical companies demonstrate high levels of environmental disclosure across the study period.
2. Environmental disclosure practices remain consistent, with minimal variation over time.
3. Dr. Reddy's Laboratories Limited exhibits marginally higher disclosure scores than Sun Pharmaceutical Industries Limited.
4. Statistical analysis confirms that the difference in disclosure practices is not significant.
5. Environmental disclosure in the Indian pharmaceutical sector appears to be driven by industry norms and stakeholder expectations.

14. IMPLICATIONS OF THE STUDY

The conclusions of this investigation have a number of practical and theoretical impacts. The findings emphasize the need of maintaining consistent and thorough environmental disclosures to improve transparency and stakeholder confidence. For policymakers and regulators, the study underscores the need for standardised environmental disclosure guidelines to improve comparability across firms.

From an academic perspective, the study contributes to the limited literature on environmental disclosure practices within the Indian pharmaceutical industry and demonstrates the usefulness of inductively developed disclosure frameworks.

15. LIMITATIONS OF THE STUDY

1. The study is limited to two pharmaceutical companies, which restricts the generalisation of findings.
2. The analysis is based solely on secondary data obtained from annual reports and published disclosures.
3. Disclosure presence does not necessarily indicate actual environmental performance or effectiveness.
4. The binary scoring method captures only the existence of disclosure and not its qualitative depth.



16. CONCLUSION

Environmental disclosure practices among leading Indian pharmaceutical firms have strengthened significantly in recent years. The results of this study indicate that both Sun Pharmaceutical Industries Limited and Dr. Reddy's Laboratories Limited demonstrate a strong commitment to environmental transparency and sustainability reporting. While minor differences exist in disclosure completeness, statistical investigation confirms that these changes are not significant.

This research concludes that environmental disclosure has become an established practice within the Indian pharmaceutical industry, driven by regulatory expectations, stakeholder pressure, and global sustainability trends. Future research may expand the scope of analysis by including more companies, longer time horizons, and performance-based disclosure measures.

REFERENCES (ACADEMIC LITERATURE)

- Chakraborty, P., & Chatterjee, C. (2020). Environmental disclosure practices in pollution-intensive industries in India. *Asian Journal of Sustainability and Social Responsibility*, 5(1), 1–15. <https://doi.org/10.1186/s41180-020-00033-x>
- Das, S., Kumar, R., & Sharma, P. (2024). Environmental accounting and disclosure practices in Indian corporations. *Journal of Cleaner Production*, 418, 138078.
- Goyal, P., Rahman, Z., & Kazmi, A. A. (2021). Corporate sustainability disclosure practices in India: Determinants and implications. *Journal of Cleaner Production*, 284, 124–137. <https://doi.org/10.1016/j.jclepro.2020.124137>
- Kumar, S., & Firoz, M. (2021). Sustainability reporting practices of Indian companies under BRSR. *Journal of Corporate Governance and Sustainability*, 6(2), 89–103.
- Mishra, S., & Suar, D. (2019). Does corporate environmental responsibility influence firm performance? Evidence from India. *Journal of Environmental Management*, 244, 1–10. <https://doi.org/10.1016/j.jenvman.2019.05.021>
- Sharma, A., & Khanna, R. (2022). Environmental disclosure practices of Indian manufacturing firms. *International Journal of Disclosure and Governance*, 19(3), 215–230. <https://doi.org/10.1057/s41310-022-00145-2>

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PRACTICES AMONG LEADING INDIAN PHARMACEUTICAL COMPANIES**

Published in Volume 04, Issue 07, June 2026.

EDITOR IN CHIEF

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PRACTICES AMONG LEADING INDIAN PHARMACEUTICAL COMPANIES**

Published in Volume 04, Issue 07, June 2026.

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