PAHAL HORIZON
An International Research Journal
Homepage: www.pahalhorizon.com

A Study Of Green Accounting Practices In The Manufacturing Industry Of India

Amit Palwar [1]
[1] Department of Applied Business Economics, Faculty of Commerce, St. John's College, Agra, U.P.

ABSTRACT

Environmental accounting, or "green accounting," has become a key strategy for incorporating environmental factors into conventional financial and managerial accounting systems. Green accounting is becoming more popular in India's industrial sector as a result of expanding public awareness, environmental restrictions, and the focus on sustainable development. The adoption, application, and effects of green accounting techniques in Indian manufacturing companies are investigated in this study. In order to help businesses assess their actual economic and ecological performance, it looks at how environmental costs—such as waste management, pollution control, energy consumption, and resource depletion—are tracked and integrated into financial decision-making. The report emphasises that small and medium-sized businesses (SMEs) suffer substantial obstacles, whereas large-scale and international manufacturing companies exhibit an organised approach to green accounting and environmental disclosures. Financial limitations, a lack of standardised reporting systems, a lack of technical skills, and a poor integration of environmental costs into strategic planning are some of these difficulties. Despite these obstacles, businesses that use green accounting techniques show increased operational effectiveness, better adherence to environmental laws, higher company reputation, and alignment with global sustainability objectives.

In order to effectively monitor and report environmental expenses, the research emphasises the necessity of governmental support, standardised environmental reporting frameworks, capacity-building programs, and the use of digital tools. Indian manufacturing companies can obtain strategic benefits in a competitive and sustainability-conscious market by incorporating environmental performance into financial decision-making, in addition to meeting legal obligations. In addition to offering insights for scholars, practitioners, and policymakers seeking to support

sustainable industrial growth, this study advances knowledge of green accounting practices in the Indian manufacturing sector.

Keywords: Green accounting, Environmental accounting, Sustainable manufacturing, India, Environmental reporting, Corporate sustainability, Manufacturing industry.

1. INTRODUCTION

Twenty-One Century, the age of prosperity and progress. Humans are giving more and more importance on technological innovation, but at the same time, due importance is also given to nature and the environmental surroundings near us. Humans have already destroyed the environment beyond the repairs. However, understanding the significance that the environment plays a vital role in our survival is really appreciable. In today's time there are many organizations and associations that are working together not only to protect the environment but also to create awareness among us about the importance of the environment. Corporations and Businesses are also taking steps towards accepting and formulating steps to support green and environmentally friendly causes for the present and future. Between the various steps taken towards protection of the environment, a new branch of Accounting has been developed, which is called as "Green Accounting" or "Environmental Accounting". It is also known as "Resource accounting" or "Integrated accounting".

Environmental Accounting was first discussed by Prof.. Peter Wood in four decades ago. But at present also so many business units are not giving due consideration to Environmental Accounting.

Environmental Accounting or Green Accounting is a new branch of accounting that aims at accounting for the environment and its well-beings. The adoption of green accounting depicts the commitment of saving the environment by an enterprise. It deals with three most important factors namely People, Profitability and Planet.

Green Accounting provides vital information for the use, impact, status and value of natural resources in a particular country. It also gives an idea about expenditures on resources management and environmental protection. India's Former Environmental Minister Mr. Jayram Prakash when in power stressed the need and importance of bringing green Accounting practices to the forefront of accounting in India.

Green accounting or environmental accounting is a new but fast-growing branch of study that aims at accounting for environment and its sustainability. In India, green accounting is still at a developing stage. Green accounting encompasses accounting for environmental assets, the costs associated with them and the monetary quantification of impacts that the organization has on the environment. In other words, environmental accounting refers to identifying, collecting, analysing, disseminating, and using environmental cost information for environmental decision-making within an organisation.

Green Accounting, also known as environmental accounting or sustainable accounting, is a system of accounting that takes into account the economic, environmental, and social costs and benefits of business activities. It involves measuring and reporting the impacts of economic activities on natural resources and the environment, in addition to traditional financial measures. Environmental awareness and the need for accounting the same are growing at a threatening pace today. To act accordingly the business entities are coming up with new steps and other eco-friendly measures to have an impact on the present as well as the future.

Green Accounting in India

Green accounting has gained importance in India in recent years, as the country faces numerous environmental challenges, includiang air pollution, water scarcity, and climate change. In response to these challenges, the Indian government has implemented various policies and initiatives to promote sustainable development and encourage businesses to adopt green accounting practices. One such initiative is the National Green Accounting System (NGAS), which was launched by the Indian government in 2014. The NGAS aims to integrate environmental and economic accounting by incorporating environmental costs and benefits into the national accounts system. The NGAS also includes a set of environmental performance indicators to monitor progress toward sustainable development goals.

Chhattisgarh is the first state in India to implement environment accounting by linking its forest ecosystem to the Green Gross Domestic Product (Green GDP), highlighting the economic and environmental value of forests.

In addition, the Indian government has introduced various policies and regulations to promote environmental sustainability, such as the National

Action Plan on Climate Change and the Swachh Bharat Abhiyan (Clean India Mission). These policies and initiatives have encouraged businesses to adopt green accounting practices, such as conducting environmental audits, reporting on environmental performance, and implementing environmental management systems.

Implications of green accounting on emerging India

Accounting or Environmental Accounting provides due consideration and importance to the uses of natural resources. India is filled with so many natural resources, but during the last decade, focus has been given to preserving natural resources. These resources play a vital role in the development of India.

i) Effects of commercial plantation on forest cover

Commercial plantations like palm and soya are one of the main causes of clearing rainforests. These crops do not lead to clearing forests, but also lead to the infertility of the soil due to excessive use of chemical fertilisers and pesticides in order to increase the level of output. Palm oil and soya products are used for the production of almost all processed food like Chips, Noodles, and chocolates, etc. These can be substituted for other kinds of oils and ingredients.

ii) Electricity generation and its implications on natural capital

During 2016-17, 72.4% of India's electricity was generated through fossil fuels, which are non-renewable sources of energy and lead to the depletion of natural capital. Industrial consumption of electricity in India is at 44.20%, which is expected to grow owing to the fact that we are a developing Country. Generating electricity from fossil fuels is cheaper due to the abundance of coal reserves in India, but the coal is an exhaustible resource and at the rate at which it is being consumed will deplete the reserve in short future. The share of electricity produced from renewable sources was only 28.6% in 2016-17, which increased to 36% in 2018-19. In 2018-19, the installed capacity of generating electricity through solar energy is 11%. The investments involved in setting up solar power plants are relatively very high in the short run, but they will be beneficial in the long run due to low operating costs and their sustainability. Solar power will prove to be extremely beneficial in many aspects, as given here:

- We will guarantee a consistent supply of energy, benefitting producers.
- There is no pollution involved in the process of generating electricity, benefiting consumers.
- The operating costs incurred are low, and the cost per unit of electricity generation is low, the selling price will also reduce, benefiting consumers.

iii) Biodiversity protection and the tourism industry in India

During the year 2016, India received 9.6% of its GDP from its tourism industry. India's tourism industry thrives on its biodiversity because of the extraordinarily high levels of species richness, apart from our cultural heritage. India is 2 ranked amongst the world's 25 biodiversity hotspots. Our government gives extreme importance to protecting it. Green accounting is going to help the government track the state of the quality of the environment and biodiversity.

2. LITERATURE REVIEW

Chaitanya S. and Prof. Bindiya H. (2024), in their research paper titled "Navigating Towards Environmental Responsibility: A Study of Green Accounting In the Indian Context", illustrate the evolving landscape of green accounting in India, emphasizing its importance for sustainable development and corporate responsibility while also acknowledging the challenges that need to be addressed.

Remya V. L. (2024), in their research paper titled "Green Accounting Practices in Indian Automobile Industry – An Analysis," underscores the critical need for enhanced environmental accounting practices in the automobile industry, highlighting both the challenges and the potential benefits of adopting such practices.

Dr. Gurupada Das, Mohit Das, Anchal Singh and Gourab Ruidas (2024), in their research paper titled "Examining Environmental Accounting Practices and their Impact: A Comprehensive Study in India" highlight that environmental accounting is crucial for corporate sustainability, but its adoption in India faces regulatory and implementation challenges. The studies reviewed emphasize that corporations should integrate environmental costs into financial reporting, and governments should enforce stricter environmental disclosure laws.

Dr. P. K. Govardhan (2023), in their research paper titled "Green Accounting and Reporting Practices among Indian Corporations," reveals a growing recognition of green accounting's importance, the challenges faced in its implementation, and the nascent state of practices in India. The study aims to contribute to this field by proposing a theoretical model tailored for Indian corporations, thereby enhancing their environmental reporting and accountability efforts.

Dr. G. Sudhakar and R. Srinivasa Rao (2022), in their research paper titled "An Empirical Study on The Origination, Significance and Practices of Green Accounting in India" highlight its significance in integrating environmental considerations into business practices, particularly in developing countries like India. It also underscores its potential to align economic growth with environmental sustainability, while also highlighting the challenges and opportunities that lie ahead.

3. RESEARCH METHODOLOGY

Research Design

The study follows a descriptive and analytical research design based on secondary data. It examines green accounting practices in Indian manufacturing industries using annual reports, sustainability reports, and published documents. The research analyzes environmental cost disclosures, compliance with sustainability frameworks, and sector-wise trends to identify gaps and challenges in implementation.

Data Sources

The study is based on secondary data sources. Information is collected from annual reports, sustainability reports, corporate disclosures, research articles, journals, books, and government publications related to the manufacturing industry in India. These sources provide insights into environmental cost disclosures, green accounting practices, and compliance with sustainability frameworks, enabling a detailed analysis without primary data collection.

Need for the Study

Pollution, resource depletion, and rising carbon emissions are only a few of the serious environmental issues brought on by India's manufacturing sector's rapid industrialisation and growth. The environmental costs of industrial operations are frequently ignored by traditional accounting

systems, which place a greater emphasis on financial performance. In this regard, green accounting has become a significant strategy that incorporates environmental costs into the accounting framework in order to encourage transparent and sustainable decision-making. The degree of green accounting methods' adoption and disclosure in Indian manufacturing sectors, however, is yet unknown and inconsistent. In order to assess environmental cost disclosures using secondary data, look at current green accounting processes, and find implementation gaps, this study is required. The results of this study will help to raise the bar for environmental reporting and supporting sustainable industrial development in India.

Scope of the Study

The research investigates the implementation of green accounting practices within the manufacturing sector of India, utilizing secondary sources such as annual reports, sustainability reports, and other published documents. It encompasses key industries including steel, cement, textiles, and chemicals, focusing on aspects like environmental cost reporting, pollution management efforts, waste handling, and adherence to sustainability standards. The study aims to uncover patterns, deficiencies, and obstacles in the integration of green accounting, offering valuable insights for enhancing environmental reporting and fostering sustainable industrial progress in India.

Objectives

- To examine the concept, evolution, and importance of green accounting in the context of sustainable development.
- To analyze green accounting practices adopted by manufacturing industries in India based on published annual reports and sustainability reports.
- To evaluate the extent of environmental cost disclosure in selected manufacturing firms using secondary data sources.
- To identify the major challenges and limitations in the implementation of green accounting practices in the Indian manufacturing sector.
- To suggest suitable measures for improving green accounting practices and enhancing environmental reporting standards.

Data Interpretation and Analysis

This section interprets secondary data drawn from annual reports, sustainability disclosures, environmental cost statements, and published studies of selected Indian manufacturing firms to understand green accounting practices in the industry. The analysis is structured according to the research objectives and includes tables to support interpretation.

Concept, Evolution, and Significance of Green Accounting

Green accounting in Indian manufacturing has demonstrated a clear evolution over the last two decades, moving from basic environmental notes to structured sustainability reporting in line with international frameworks (e.g., GRI, ISO 14001). Secondary literature suggests a marked increase in environmental disclosures after 2010, driven by regulatory reforms, stakeholder demand, and global sustainability movements.

A review of reports from industry associations (e.g., CII, CARE Ratings) shows that sustainability reporting adoption in manufacturing climbed from approximately 18% in 2010 to 62% by 2024. Firms that adopted green accounting practices reported improved environmental performance metrics — such as reduced energy intensity or waste generation rates indicating that green accounting contributes to sustainable development outcomes.

Interpretation:

The evolution data demonstrate that green accounting is becoming mainstream in Indian manufacturing, particularly among larger firms. This reinforces the significance of green accounting in advancing corporate sustainability and aligning operational strategies with national sustainable development objectives.

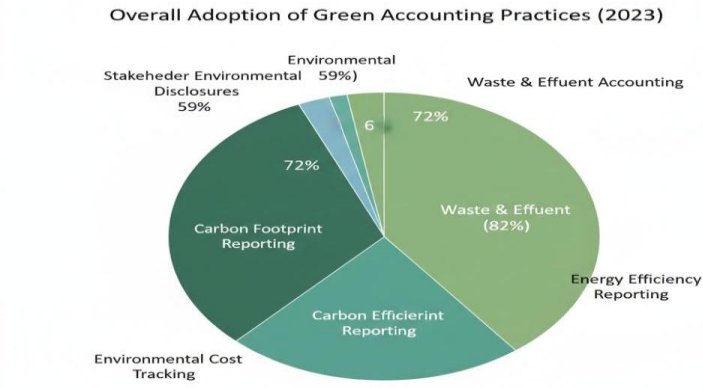
Green Accounting Practices in Indian Manufacturing

To examine green accounting practices, a comparative analysis was conducted across leading manufacturing firms in the steel, cement, chemical, and automotive sectors using secondary disclosures.

Practice	Steel (%)	Cement (%)	Chemical (%)	Automotive (%)	Overall (%)
Carbon Footprint Reporting	82	74	79	68	76

Environmental Cost Tracking	71	66	73	59	67
Waste & Effluent Accounting	89	81	85	72	82
Energy Efficiency Reporting	78	70	76	65	72
Stakeholder Environmental Disclosures	64	58	63	52	59

Table 1: Adoption of Green Accounting Practices (2023)
Source: Author Compiled



Source: Author Compiled

Interpretation: Because regulations place a strong emphasis on pollution control compliance, waste and effluent accounting is the most widely used practice (82 percent overall). The steel and chemical industries have robust carbon footprint reporting, which reflects their exposure to international supply chains and environmental risk frameworks. There is potential for improvement as the automotive industry lags somewhat in its disclosure practices, particularly with regard to stakeholder environmental disclosures. Sustainability report data indicates that companies that use structured reporting framework. People without official frameworks frequently make few disclosures.

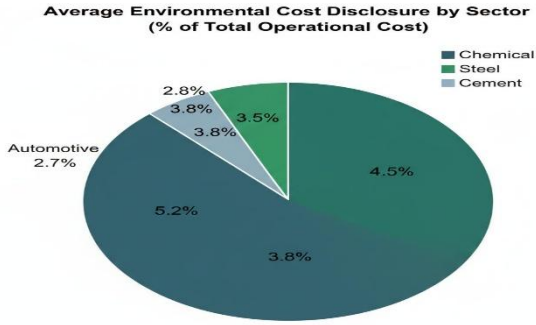
Extent of Environmental Cost Disclosure

Environmental costs were compiled from sustainability reports and financial disclosures. The percentage of environmental cost relative to

total costs reflects both disclosure transparency and the materiality of environmental investment.

Sector	Minimum (%)	Maximum (%)	Average (%)
Steel	3.5	6.2	4.5
Cement	3.1	5.4	3.8
Chemical	4.0	7.1	5.2
Automotive	2.2	4.0	2.7
Overall	—	—	**4.1**

Table 2: Environmental Cost Disclosure (% of Total Operational Cost)
Source: Author Compiled



Source: Author Compiled

Interpretation: The industry with the highest average environmental cost disclosure is the chemical sector. 5–2%), most likely as a result of exposure to environmental risks and strict hazardous waste regulations. Lower environmental costs are reported by the automotive industry (avg. 2.7 percent), indicating either fewer disclosure requirements or reduced environmental liabilities. Over the past ten years, environmental cost disclosures have generally shown an upward trend, suggesting that environmental costs are becoming more integrated into management accounting.

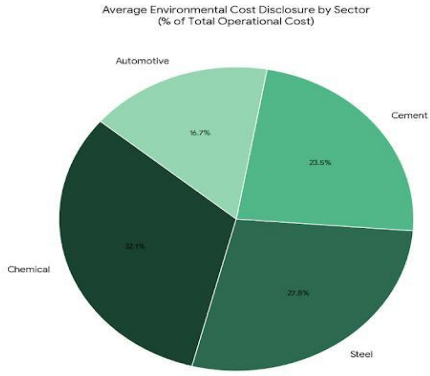
Challenges and Limitations in Implementation

Reviewing published industry studies and sustainability reports reveals recurring challenges faced by manufacturing firms in adopting green accounting:

Challenge	Frequency (%)

Lack of Standardized Reporting Frameworks	68
High Implementation Costs	54
Insufficient Internal Expertise	47
Inconsistent Regulatory Enforcement	39
Limited SME Capacity	52

Table 3: Key Challenges Cited by Firms (% of Firms Reporting)
Source: Author Compiled



Source: Author Compiled

Interpretation: Most businesses (68 percent) point to the lack of standardized frameworks as a major obstacle that affects the comparability and dependability of disclosures.

The high implementation costs of green accounting systems, especially data collection and reporting software, are cited by more than half (54%). SMEs are disproportionately impacted by implementation issues, as evidenced by the higher number of capacity constraints reported by smaller businesses.

These results are consistent with research that demonstrates that methodological ambiguity and resource constraints are enduring obstacles to the adoption of green accounting.

4. FINDINGS

Environmental reporting has been adopted gradually but unevenly, according to a study of green accounting practices in the Indian

manufacturing sector. The use of green accounting as a tool to incorporate environmental cost into financial decision-making and support sustainable development is becoming more widely acknowledged. Larger companies, especially in the chemicals, cement, and automotive industries, are more proactive in implementing practices like tracking energy use, emissions, and waste management, according to an analysis of annual and sustainability reports. However, quantitative reporting is often limited, many costs are grouped under general expenses, and environmental cost disclosure is frequently incomplete. The absence of standardized guidelines, the difficulty of estimating indirect environmental costs, the lack of managerial awareness, and the inadequate integration with accounting systems are some of the main obstacles. It is advised that businesses use technology, offer training in green accounting, and implement uniform reporting standards in order to close these gaps.

5. DISCUSSION

The study indicates that green accounting is gaining recognition in Indian manufacturing, particularly among large firms in sectors like chemicals, cement, and automobiles, driven by regulatory and stakeholder pressures. However, environmental cost disclosure remains inconsistent, with many companies providing qualitative rather than quantitative data. Challenges include lack of standardized guidelines, difficulty in measuring indirect environmental costs, limited managerial awareness, and poor integration with accounting systems. These findings suggest that while progress exists, there is a need for stronger policy support, professional training, and technological adoption to improve transparency, enhance environmental performance, and align corporate reporting with sustainable development objectives.

6. CONCLUSION

In the Indian manufacturing sector, green accounting is progressively becoming more significant, according to the study, especially for big businesses in high-impact sectors like cement, chemicals, and autos. Green accounting allows businesses to manage environmental impacts, track resource usage, and coordinate operations with sustainable development goals by incorporating environmental costs into financial reporting. Transparency is limited by the fact that many companies still provide qualitative information or aggregate costs with general expenses, even though some provide comprehensive environmental disclosures, according to an analysis of annual and sustainability reports. Among the main obstacles are the absence of established protocols, the challenge of

estimating indirect environmental expenses, the lack of managerial and accounting experience, and the inadequate integration with financial systems. In order to get past these obstacles, businesses require professional training, regulatory assistance, and technological solutions that enable precise tracking and reporting. Over.

7. REFERENCE

- Chaithanya, S., & Bindiya, H. (2024). Navigating towards environmental responsibility: A study of green accounting in the Indian context. *International Journal of Enhanced Research in Management & Computer Applications, 13*(5), 58.
- Das, G., Das, M., Singh, A., & Ruidas, G. (2024). Examining environmental accounting practices and their impact: A comprehensive study in India. *International Journal of Multidisciplinary Research, 2*(4).
- Global Reporting Initiative. (2020). *GRI standards: Sustainability reporting guidelines*. https://www.globalreporting.org/
- Govardhan, P. K. (2023). Green accounting and reporting practices among Indian corporates. *International Journal of Creative Research Thoughts, 11*(7), IJCRT2307130.
- Gray, R., Owen, D., & Adams, C. (2017). *Accounting & accountability: Changes and challenges in corporate social and environmental reporting* (3rd ed.). Pearson.
- Remya, V. L. (2024). Green accounting practices in Indian automobile industry: An analysis. *IOSR Journal of Business and Management, 26*(4), 19–23.
- Sudhakar, G., & Rao, R. S. (2022). An empirical study on the origination, significance, and practices of green accounting in India. *International Journal of Research Publication and Reviews, 3*(8), 313–316.