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Utilizing AI for enhanced green accounting in the context of sustainable development in India

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Abstract
Green Accounting is an important device for understanding the role of business ventures in the economy regarding environmental security and welfare. This is a well-known term for environmental and natural resource accounting. The integration of Artificial Intelligence (AI) in sustainable accounting represents a transformative approach to enhance the accuracy, efficiency, and comprehensiveness of environmental impact assessment and reporting. This study explores the development of AI-driven models aimed at advancing sustainable accounting practices, focusing on environmental impact assessment and transparent reporting. Green Accounting and Reporting will help organizations in India to identify resource utilization and incurred costs. Recent years have witnessed rising concern for environmental degradation, which occurs mainly in the form of pollution of various types, such as air, water, sound, soil erosion, and deforestation; however, the adoption of AI-driven financial forecasting also presents challenges and considerations for accounting practices. These include concerns about data privacy and security, the need for specialized skills and expertise in AI technologies, and ethical considerations surrounding the use of AI algorithms in financial decision-making.

Keywords: Green Accounting, Artificial Intelligence (AI), sustainable development, environmental accounting, data analytics, environmental management, sustainability reporting

Introduction
Accounting for the environment helps to accurately assess the costs and benefits of companies' environmental preservation measures. It provides a common framework for organizations to identify and account for past, present, and future environmental costs to support managerial decision-making, control, and public disclosure. Sustainability involves the adaptation of today's business model to the dynamic nature of digitalized environments. In other words, corporations need to ensure that resources, especially technology, are being used responsibly and efficiently to improve the lives of the present and future generations, as well as strengthen their relationships with the environment. The environmental externalities generated by corporations have reached alarming levels, making it essential to implement effective environmental protection measures. Recognizing this urgent need, many organizations and associations have taken steps to safeguard the environment and raise awareness of these critical issues. Today, environmental awareness and the necessity to account for environmental impacts are growing at a rapid pace. In response, businesses are introducing new initiatives and eco-friendly practices aimed at creating positive effects, both now and in the future.
Green accounting, also known as environmental accounting, is an emerging but rapidly expanding field that focuses on environmental accounting and ensuring sustainability. This discipline is still in its developmental phase in India. Green accounting involves tracking environmental assets, calculating the costs associated with them, and assigning monetary values to an organization's environmental impacts. Environmental accounting refers to the process of identifying, gathering, analyzing, sharing, and applying environmental cost data to support informed environmental decision making within a business.

Sustainability Development and Green Accounting
Green accounting is one of the most influential tools that affect the national economy today; it incorporates the concept of sustainability into economic development and is an excellent

step towards a better future for the planet. Green accounting (also called environmental or sustainability accounting) is a process that integrates environmental and social aspects in financial operations, and financial ratios, such as revenues and costs, are the leading indicators of a company's performance. However, green accounting is an expanded concept that accounts for non-financial indicators such as the environment, social impact, and sustainable development.

This type of accounting is a new trend in the corporate economic world. It is a natural way of thinking and doing business that helps organizations create value for stakeholders beyond capital increases.

Green finance and sustainable finance are financial activities that support the transition to a low-carbon, sustainable economy while addressing the global challenges we face today, such as climate change and emerging environmental and sustainability risks. Green finance involves financing projects and initiatives with solid ecological impacts such as reducing greenhouse gas emissions and promoting renewable energy. On the other hand, sustainable finance integrates social, environmental, and governance (ESG) factors into investment decisions to promote long-term economic growth, social outcomes, and ecological sustainability. Green and sustainable finance aim to drive positive change by mobilizing capital towards activities that promote sustainability and reduce negative environmental impacts.

Artificial intelligence: Artificial intelligence is the simulation of human intelligence processes using machines, especially computer systems. The specific applications of AI include expert systems, natural language processing, speech recognition, and machine vision. AI systems work by combining large sets of data with intelligent iterative processing algorithms to learn from patterns and features in the data that they analyze. Each time an AI system runs a round of data processing, it tests and measures its own performance, and develops additional expertise. Because AI never needs a break, it can run through hundreds, thousands, or even millions of tasks extremely quickly, learning a great deal in very little time and becoming extremely capable of being trained to accomplish.

Contribution of AI to sustainable accounting

Objectives

- To examine the present condition of green accounting practices in India
- To identify the potential role of AI in improving green accounting processes
- To develop an AI-driven framework or model for green accounting
- To evaluate challenges and barriers in adopting AI for green accounting in India

1. To examine the present condition of green accounting practices in India, this study focuses on assessing the current status of environmental and green accounting adoption across Indian industries and identifying how companies measure, report, and disclose their environmental costs, liabilities, and sustainability efforts. It explores the degree of compliance with existing standards, the level of voluntary versus mandatory disclosures, and sector-wise differences.
2. To identify the potential role of Artificial Intelligence (AI) in improving green accounting processes, given the gaps in data collection, analysis, and reporting identified in prior studies, this study aims to explore how AI tools such as machine learning, natural language processing, and predictive analytics can enhance the accuracy, efficiency, and transparency of green accounting practices.
3. To develop an AI-driven framework or model for green accounting Building on insights from current practices and AI capabilities, this objective seeks to design a conceptual or practical framework that integrates AI solutions into the environmental accounting process, covering data acquisition, processing, performance measurement, and stakeholder reporting.
4. To evaluate challenges and barriers in adopting AI for green accounting in India This objective addresses the potential obstacles companies may face, such as technological readiness, data availability, skill gaps, financial costs, ethical concerns, and regulatory hurdles, while transitioning to AI-enhanced green accounting systems.

Literature Review

1. In the paper "Green Accounting Practices by Dr. K. Kanaka Raju" (Published in Indian Journal of Accounting, 2018) [1], Dr. K. Kanaka Raju (2018) [1] emphasized that green accounting involves recognizing the costs and benefits of environmental protection, integrating them into economic and social decision-making. His study highlighted the importance of environmental policy, corporate sustainability, environmental costs and benefits, and conservation of energy as key parameters that influence environmental performance. Prior literature reviewed by Raju revealed that environmental accounting practices often lack quantitative detail (Shukla & Vyas, 2013), suffer from inconsistent disclosure standards (Walden & Schwartz, 1997), and face challenges in integrating environmental data into financial reports. Despite these gaps, scholars like Schaltegger & Burritt (2010) and Riccaboni & Leone (2010) have called for social and environmental accounting to be incorporated into broader corporate planning and decision-making frameworks
2. In the Paper "Leveraging AI for sustainable accounting: Developing models for environmental impact assessment and reporting" by Beatrice Oyinkansola Adelakun, Bernard Owusu Antwi, Afari Ntiakoh, & Augustine Obinna Eziefule -Expanding on these foundational ideas, recent research by Adelakun, Antwi, Ntiakoh, and Eziefule (2024) [2] introduces Artificial Intelligence (AI) as a transformative tool for advancing sustainable accounting practices. Their study argues that AI technologies — particularly machine learning (ML), natural language processing (NLP), and predictive analytics — can dramatically improve the accuracy, efficiency, and transparency of environmental impact assessments. Unlike traditional manual methods, AI enables organizations to process vast, heterogeneous data sources (such as IoT sensors, satellite imagery, and corporate disclosures) in real time, providing timely insights for decision-making and regulatory compliance.
3. In the paper "A Study of Green Accounting Practices in

India" by Manan Chetankumar Mehta, The author highlights that environmental accounting in India is still at a preliminary stage. Much of what is reported by companies focuses primarily on compliance with regulations, rather than proactive sustainability leadership. Mehta identifies two primary categories of environmental disclosure among Indian companies:Mandatory disclosures — required by law, covering energy conservation, pollution control, and technology absorption.Voluntary disclosures — including sustainability reports, Global Reporting Initiative (GRI) reports, internet-based environmental reports, and satellite-based disclosures.

4. In the paper "Green Accounting and Reporting Practices Among Indian Corporates" by Dr. P. K. Govardhan (2023) [4], the concept of green accounting is framed as a vital component of corporate social responsibility in India. The paper positions green accounting as more than just social cost-benefit analysis; it involves the identification, measurement, integration, and reporting of environmental costs and impacts within corporate financial systems.
5. In the Paper "Green accounting practises: a study of select companies in india"-By Aarathi, Shweta Sasidharan, Sneha Srivastava, and Dr. Kavitha D (2018) [5], the authors explore the evolving field of green accounting and its application in prominent Indian corporations. The paper emphasizes that green accounting, or environmental accounting, is a relatively new but crucial practice aimed at accounting for environmental assets, costs, and the monetary impact of corporate activities on the environment.
6. In the paper "Role of artificial intelligence in enhancing sustainability reporting and green accounting in industry 4"-by Ayesha TARIQ, Mohd Reyaz Ur RAHIM- paper explores how Artificial Intelligence (AI) can transform sustainability reporting and green accounting practices under the context of Industry 4.0 — the era of digital transformation characterized by interconnected technologies like IoT, big data, blockchain, and automation.

Results and Discussion

The literature review reveals that green accounting in India is still in its nascent stages, primarily focused on regulatory compliance rather than proactive sustainability leadership. While there's growing awareness of environmental degradation and the necessity of accounting for environmental impacts, companies often lack quantitative detail in their environmental accounting practices and face challenges in integrating environmental data into financial reports. This highlights a significant gap in standardized guidelines and frameworks for green accounting in the Indian context.

Current State of Green Accounting in India: As identified in objective 1, the current condition of green accounting practices in India is largely characterized by mandatory disclosures related to energy conservation, pollution control, and technology absorption. Voluntary disclosures, such as sustainability reports and Global Reporting Initiative (GRI) reports, also exist, but the overall emphasis remains on compliance rather than comprehensive environmental cost and benefit integration. This aligns with the research gap indicating limited sector- or company-specific studies and insufficient quantitative data in this area.

Potential Role of AI in Improving Green Accounting Processes: Addressing objective the literature strongly suggests that Artificial Intelligence (AI) can play a transformative role in enhancing green accounting processes. AI technologies, including Machine Learning (ML), Natural Language Processing (NLP), and predictive analytics, can significantly improve the accuracy, efficiency, and transparency of environmental impact assessments. AI can automate the extraction of unstructured sustainability information, enhance the precision of carbon footprint calculations across complex supply chains, and offer real-time insights into resource utilization and waste generation. Furthermore, AI's predictive capabilities enable scenario analysis, allowing organizations to simulate environmental effects of business strategies and pinpoint optimal routes for sustainability objectives. This direct contribution of AI addresses the research gap regarding the limited use of advanced tools and technologies in current green accounting practices.

Developing an AI-Driven Framework for Green Accounting: In line with objective 3, the integration of AI in sustainable accounting represents a transformative approach for environmental impact assessment and transparent reporting. An AI-driven framework for green accounting would cover data acquisition, processing, performance measurement, and stakeholder reporting, moving beyond traditional financial ratios to incorporate non-financial indicators like environmental and social impact. This shift towards an AI-enhanced system directly addresses the need for better integration of environmental data into financial performance analysis, which is a noted research gap.

Challenges and Barriers in Adopting AI for Green Accounting in India: Objective 4 highlights crucial challenges in adopting AI for green accounting in India. These include concerns about data privacy and security, the necessity for specialized skills and expertise in AI technologies, and ethical considerations surrounding the use of AI algorithms in financial decision-making. These potential obstacles—such as technological readiness, data availability, skill gaps, financial costs, and regulatory hurdles—are significant barriers to transitioning to AI-enhanced green accounting systems. Overcoming these challenges is crucial for successful AI integration and for bridging the research gap related to the weak public awareness and stakeholder involvement in green accounting initiatives.

Conclusion

The integration of Artificial Intelligence (AI) in green accounting practices presents a transformative opportunity for enhancing environmental impact assessment and reporting in India. While green accounting in the country is still in its nascent stages, primarily focused on regulatory compliance, the adoption of AI technologies offers promising solutions to overcome existing limitations in data handling, analysis, and reporting. The current state of green accounting in India reveals significant gaps, including a lack

of standardized guidelines, insufficient quantitative data, and limited use of advanced technologies. However, AI-driven frameworks have the potential to address these challenges by improving accuracy, efficiency, and transparency in environmental accounting processes. Machine Learning, Natural Language Processing, and predictive analytics can automate data extraction, enhance carbon footprint calculations, and provide real-time insights into resource utilization and waste generation. Despite the potential benefits, the adoption of AI for green accounting in India faces several challenges. These include concerns about data privacy and security, the need for specialized skills and expertise, ethical considerations, and regulatory hurdles. Overcoming these obstacles is crucial for successful AI integration and the advancement of sustainable accounting practices. In conclusion, the development and implementation of AI-driven green accounting frameworks in India represent a critical step towards more comprehensive and accurate environmental impact assessments. By addressing the identified research gaps and challenges, organizations can foster a more transparent and efficient approach to sustainability reporting, ultimately contributing to accelerated sustainable development in India.

References

1. Raju KK. Green Accounting Practices. Indian Journal of Accounting. 2018.
2. Adelakun BO, Antwi BO, Ntiakoh A, Eziefule AO. Leveraging AI for sustainable accounting: Developing models for environmental impact assessment and reporting. 2024.
3. Mehta MC. A Study of Green Accounting Practices in India.
4. Govardhan PK. Green Accounting and Reporting Practices Among Indian Corporates. 2023.
5. Aarathi, Sasidharan S, Srivastava S, Kavitha D. Green accounting practises: a study of select companies in india. 2018.
6. Tariq A, Rahim MRU. Role of artificial intelligence in enhancing sustainability reporting and green accounting in industry 4.0.
7. Sujarweni W, Christmawan PEE. Green accounting practices in indonesian companies. Jurnal RAK (Riset Akuntansi Keuangan). 2024;9(1):97-105.
8. Ansari N, Nawab A. Avifauna of Surajpur Wetland, Greater Noida, Uttar Pradesh, India. J Threatened Taxa. 2015;7(11):7776-85.
9. Gola KR, Gupta G, Mendiratta P, Dharwal M. Green accounting and its application: a study on reporting practices of environmental accounting in India. World Rev Entrep Manag Sustain Dev. 2022;18(1/2):23.