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Strategic Role of Green Accounting in the Digital Era: A Systematic Review of Its Impact on ESG Disclosure and Investment Decisions

Reyinhard Sinaga, Willman Sihotang, Iskandar Muda, Erlina
Department of Accounting, Universitas Sumatera Utara, Medan Campus, Sumatera, Indonesia

Accounting's emphasis has changed from standard financial reporting to sustainability reporting that takes environmental factors into account as a result of the sustainable development paradigm's evolution. In order to facilitate the incorporation of environmental data into the ESG (Environmental, Social, and Governance) reporting framework, green accounting has become a popular strategic approach. A comprehensive evaluation of recent research on the effects of green accounting on the quality of ESG disclosure, risk perception, and investment decision-making, as well as the use of digital technology in corporate operations, is the goal of this study. By analyzing 74 Scopus-indexed articles published between 2021 and 2024, this study finds that the integration of green accounting enhances the transparency and accountability of environmental reporting, influences firm valuation, and serves as a credibility signal to the market. Furthermore, the adoption of technologies such as AI, blockchain, and big data has proven to improve the accuracy and effectiveness of green accounting practices, although technical and resource-related challenges remain, particularly in developing countries and the SME sector. This study makes both theoretical and practical contributions to support more sustainable decision-making and proposes a future research agenda that position green accounting as a strategic instrument within the green economy.

Keywords: green accounting, environmental accounting, sustainability accounting, ESG performance.

Introduction

The global paradigm shift toward sustainable development has exerted significant pressure on the business sector to not only pursue profitability but also to demonstrate a strong commitment to environmental and social responsibility. Accounting as a discipline has also undergone a transformation—from its traditional focus on financial transaction reporting to a broader engagement with sustainability issues. One of the key developments within this transformation is green accounting, which emphasizes the measurement, disclosure, and management of the environmental impacts associated with corporate economic activities (Latifah & Soewarno, 2023; Wiredu et al., 2023).

Reyinhard Sinaga, Master, SE, Master of Accounting, Faculty Economic and Business, Universitas Sumatera Utara, Medan, Indonesia.
Willman Sihotang, Master, SE, Master of Accounting, Faculty Economic and Business, Universitas Sumatera Utara, Medan, Indonesia.
Iskandar Muda, Dr., Prof., Department of Accounting, Universitas Sumatera Utara, Medan, Indonesia.
Erlina, Ph.D., Prof., Department of Accounting, Universitas Sumatera Utara, Medan, Indonesia.

As the world becomes more aware of the climate problem and the urgency of achieving the Sustainable Development Goals (SDGs) of the UN, the importance of green accounting has increased dramatically (Oppon et al., 2023; Nakpodia et al., 2024). From a functional standpoint, green accounting is essential to the creation of thorough Environmental, Social, and Governance (ESG) disclosures (Kazemi et al., 2023; Citterio, 2024). In addition to improving organizational accountability and transparency, high-quality ESG reporting influences investor sentiment and has a significant effect on the market value of companies (Adams et al., 2023; Zhang et al., 2023).

A number of obstacles still stand in the way of green accounting's incorporation into the Environmental, Social, and Governance (ESG) framework, despite its crucial importance. Sustainability disclosures are susceptible to inconsistency due to a number of factors, including the absence of regulated reporting procedures, the ubiquity of greenwashing, and the discrepancy between intention and implementation (Birindelli et al., 2024; Bingler et al., 2024, Rutskiy, et al., 2024). Thus, basic issues about how incorporating green accounting might actually improve the caliber of ESG disclosures and impact company value in the marketplace emerge..

In the realm of investment decision-making, the availability of reliable and decision-useful green accounting information is gaining critical importance. Both institutional and individual investors are increasingly factoring Environmental, Social, and Governance (ESG) aspects—especially environmental performance—into their risk evaluations and assessments of corporate viability (Roger, 2024; Mazzarano et al., 2021; Alduais, 2023). Robust sustainability reporting is widely regarded as a mechanism to mitigate information asymmetry, build investor trust, and reduce capital costs (Gao et al., 2021; de Moraes et al., 2023). Despite this, the specific impact of green accounting disclosures on investor risk perception and decision-making remains insufficiently examined, particularly when considering variations across industries and regulatory environments.

At the same time, new opportunities for changing green accounting systems are being made possible by digital innovation. The accuracy, dependability, and timeliness of environmental data management and disclosure procedures could be greatly enhanced by emerging technologies like big data analytics, blockchain, artificial intelligence, and deep learning (Thomas et al., 2024; Alotaibi et al., 2024; Bingler et al., 2024). The incorporation of these technologies into green accounting frameworks is currently underrepresented in academic debate, nevertheless, particularly when it comes to technological constraints, issues with data quality, and the wider ethical implications of their use.

Given the urgency of sustainability issues, the rising expectations of stakeholders, and rapid technological advancements, a systematic literature review is critically needed to understand how green accounting can be optimally integrated into the ESG reporting framework and support sustainable decision-making. Therefore, this Systematic Literature Review aims to address the following three key research questions:

1. How does the integration of green accounting into the ESG reporting framework influence disclosure quality and corporate valuation?

2. To what extent does green accounting disclosure affect investor decision-making and perceived corporate risk?

3. What role does digital technology play in enhancing the effectiveness and accuracy of green accounting practices?

This research aims to synthesize the expanding landscape of scholarly work on Green Accounting. Through this Systematic Literature Review (SLR), we intend to make both theoretical and empirical contributions by systematically identifying, assessing, and integrating prior studies, thereby offering a thorough and cohesive

overview of the existing literature. In doing so, this review enhances the current academic discourse and establishes a solid foundation for guiding future investigations in this domain.

The structure of this SLR is organized as follows: The Literature Review section elaborates on the definition of green accounting, the underlying theoretical perspectives, its impact on organizational performance, and the practical aspects of its implementation. The Methodology section details the research approach and procedures employed in the review. The Findings and Discussion section presents the main results and analytical insights drawn from the literature. The concluding section outlines the key takeaways, discusses limitations, and includes a comprehensive list of references.

Literature Review

Green Accounting Concept

Green accounting—frequently referred to as environmental accounting—constitutes an evolution of conventional accounting practices, designed to embed environmental considerations into financial reporting frameworks and strategic business decisions (Saeed et al., 2024; Latifah & Soewarno, 2023). This approach involves systematically identifying, quantifying, documenting, and disclosing the environmental costs and benefits linked to organizational operations, such as those arising from carbon emissions, resource consumption, and waste management activities (Rusu et al., 2024; Brabete et al., 2024).

Green accounting also serves as a critical foundation for ESG (Environmental, Social, and Governance) sustainability reporting, with the environmental (E) dimension taking center stage (Alfianda et al., 2024, Wan et al., 2023; Nazari & Poursoleyman, 2024). However, challenges such as greenwashing, measurement uncertainty, and the lack of harmonized global standards continue to hinder its overall effectiveness (Letiche & Boucaud, 2024; Bingler et al., 2024).

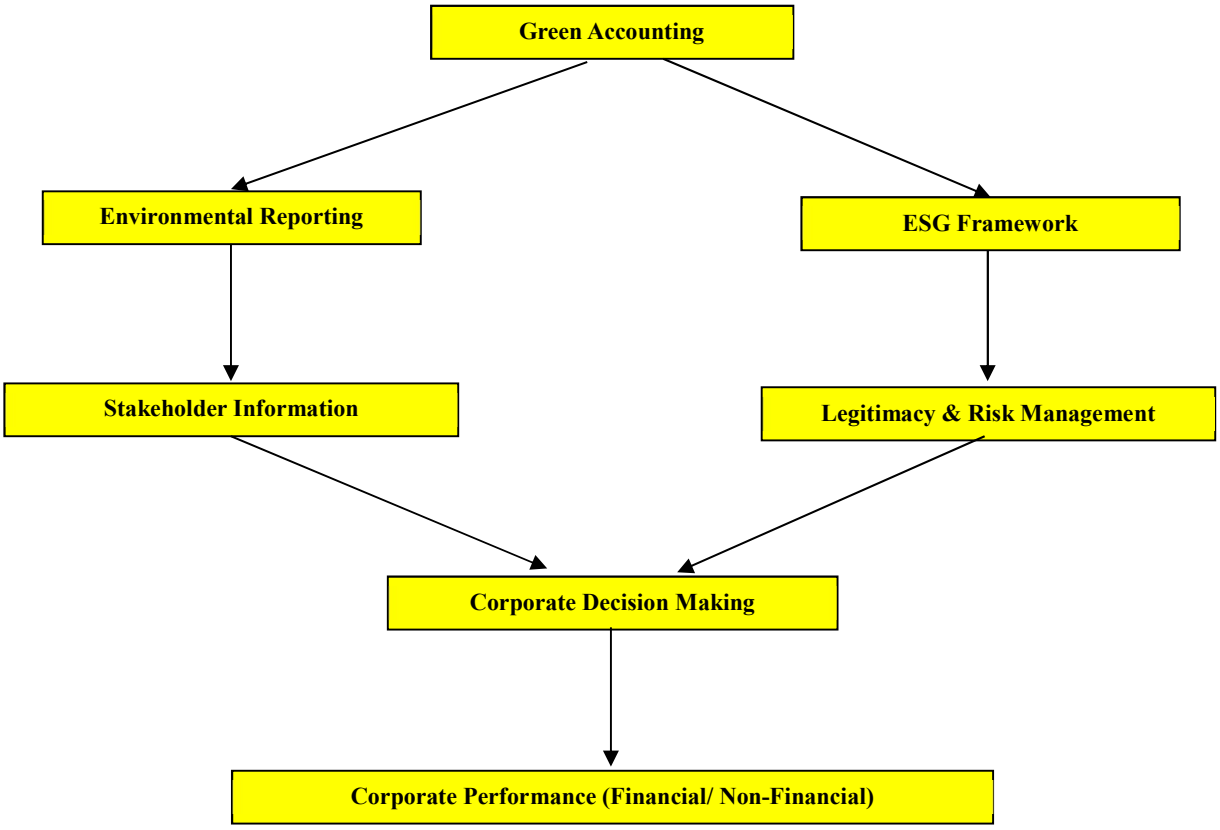

Figure 1. Visual Model of Green Accounting Consept.

Theoretical Framework Underlying Green Accounting Research

Research on green accounting consistently draws upon various theoretical frameworks to explain corporate motivations for adopting and disclosing environmentally responsible practices:

1. Legitimacy Theory: In light of mounting public pressure over ecological challenges, it is suggested that businesses reveal environmental information in order to acquire and preserve social legitimacy (Kazemi et al., 2023; Su et al., 2024).

2. Stakeholder Theory: Makes the case that environmental disclosures fulfil the demands of numerous stakeholders who are becoming more conscious of issues pertaining to ESG (de Moraes et al., 2023; Hasan et al., 2022).

3. Signaling Theory: This theory suggests that companies with excellent environmental performance utilize green accounting disclosures to communicate with the market in a positive way, which lowers the cost of capital and information asymmetry (Darsono et al., 2025; Alduais, 2023). Agency Theory: Posits that environmental disclosures help mitigate agency conflicts between managers and owners by enhancing transparency and accountability (Soeprajitno et al., 2024).

4. Institutional Theory: Highlights the influence of normative, mimetic, and coercive pressures in driving convergence in green accounting practices across firms and industries (Alnor, 2024; Latif et al., 2023).

Table 1

Summary of Theory and Its Application

Theory	Key Principles	Implementation in Green Accounting
Legitimacy Theory	Companies seek to legitimize their existence in the eyes of the public.	Disclosure of environmental information to meet social expectations and obtain a "license to operate"
Stakeholder Theory	Companies are responsible to all stakeholders, not just shareholders.	Green accounting as a response to pressure from employees, customers, investors, regulators and society
Signal Theory	Information is used as a signal to reduce information asymmetry.	High-quality ESG disclosure signals a company's commitment to sustainability and low risk.
Agency Theory	Reducing conflict between management (agent) and owner (principal)	Transparency in environmental disclosure limits opportunistic practices and increases investor confidence.
Institutional Theory	Companies adapt due to external pressures (coercive, mimetic, normative)	Adoption of green accounting standards due to the influence of regulations, global standards and dominant industry practices

Green Accounting Contribution to Company Performance

Green accounting has been shown to make significant contributions to corporate performance, encompassing both financial and non-financial dimensions:

1. Operational Efficiency Improvement: By tracking energy use and waste, firms can identify inefficiencies, reduce operational costs, and drive innovation (Latifah & Soewarno, 2023; Cho et al., 2024).

2. Reputation and Competitive Advantage: Companies with strong environmental disclosures tend to enjoy enhanced reputations and attract more customers and investors (Ullah et al., 2022; Firmansyah et al., 2023).

3. Investor Appeal and Access to Capital: Transparency in environmental reporting reduces perceived risk and appeals to socially responsible investors, thereby enhancing firm value (Nazari & Poursoleyman, 2024; Roger, 2024).

4. Risk Management and Long-Term Resilience: Green accounting enables firms to more effectively manage both transition and physical risks associated with climate change (Dikau & Volz, 2021).

5. Influence on Earnings Management: In certain contexts, green accounting practices can serve as a control mechanism against unethical earnings management behavior (Soeprajitno et al., 2024).

Implementation of Green Accounting Practices in Various Contexts

The implementation of green accounting exhibits significant variation depending on country context, industry sector, and firm size:

1. Developing vs. Developed Countries: Developing countries face implementation challenges such as limited capacity and resource constraints, while developed countries are primarily driven by stringent regulations and strong public pressure (Wiredu et al., 2023; Saptono et al., 2023).

2. Industry Sectors: Compared to the service sector, high-impact and highly polluting businesses are typically under higher pressure to implement green accounting methods (Rashed et al., 2022; Papafloratos et al., 2023).

3. Big Businesses vs. SMEs: Small and medium-sized businesses (SMEs) have the ability to implement sustainable innovations on a smaller scale, but they frequently face financial and knowledge constraints (Setyaningsih et al., 2024).

4. Digital Technology's Role: According to Wan et al. (2023) and Witzel & Bhargava (2023), technologies like artificial intelligence (AI), blockchain, and big data analytics are essential for improving the effectiveness of environmental data collection and reporting.

Research Methodology

This study does not define specific hypotheses since it uses a Systematic Literature Review (SLR) approach instead of primary empirical investigation. In order to methodically integrate previous research and extract useful insights that can significantly enhance the field of green accounting study, it instead employs a question-oriented paradigm.

To fulfill its research aims, this study applies the SLR methodology, which involves a structured and, in part, automated research protocol focused on critically examining and synthesizing the body of existing literature. This approach enables the development of a comprehensive overview, identification of key research themes, uncovering of knowledge gaps, and formulation of future research directions (Elda Du Toit, 2024).

The data for this study were retrieved from the Scopus citation database, using the keywords "green accounting," "environmental accounting," "sustainability accounting," "ESG performance," and "sustainability performance." The inclusion criteria were limited to articles published between 2021 and 2024.

Inclusion and Exclusion Criteria for data studies

The Systematic Literature Review (SLR) methodology is grounded in prior studies. Therefore, the selection of previous research as data sources must adhere to specific criteria. This is essential to ensure that the scope of the study remains focused and does not deviate from the defined research problem or from issues relevant to the phenomenon under investigation. This SLR aims to examine the extent to which green accounting disclosure influences firm performance. In line with this research objective, the studies selected as data sources for the review must meet the following inclusion and exclusion criteria:

Table 2

Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Published 2021-2024	Outside Time Period
Available data	No ISSN
International Papers, Journals or Articles indexed by Scopus	No Scopus Index
International Papers, Journals or Articles with Ranking in Scimago	Not written in English
Use/Connect with Green Accounting	Not Related to this SLR Topic
Available in Full Text	Not Available in Full Text

Search Strategy

The article search was conducted using both automated and manual methods. The automated search employed the following keywords or terms: ("green accounting" OR "environmental accounting" OR "sustainability accounting") AND ("ESG performance" OR "environmental social governance" OR "sustainability performance"). The search was performed online across selected academic journal databases, including ScienceDirect, Emerald Insight, Springer Link, ResearchGate, Taylor & Francis, JSTOR, and PROQUEST. Subsequently, a manual search was conducted by reviewing references from earlier years through Google Scholar and other reputable international journal websites.

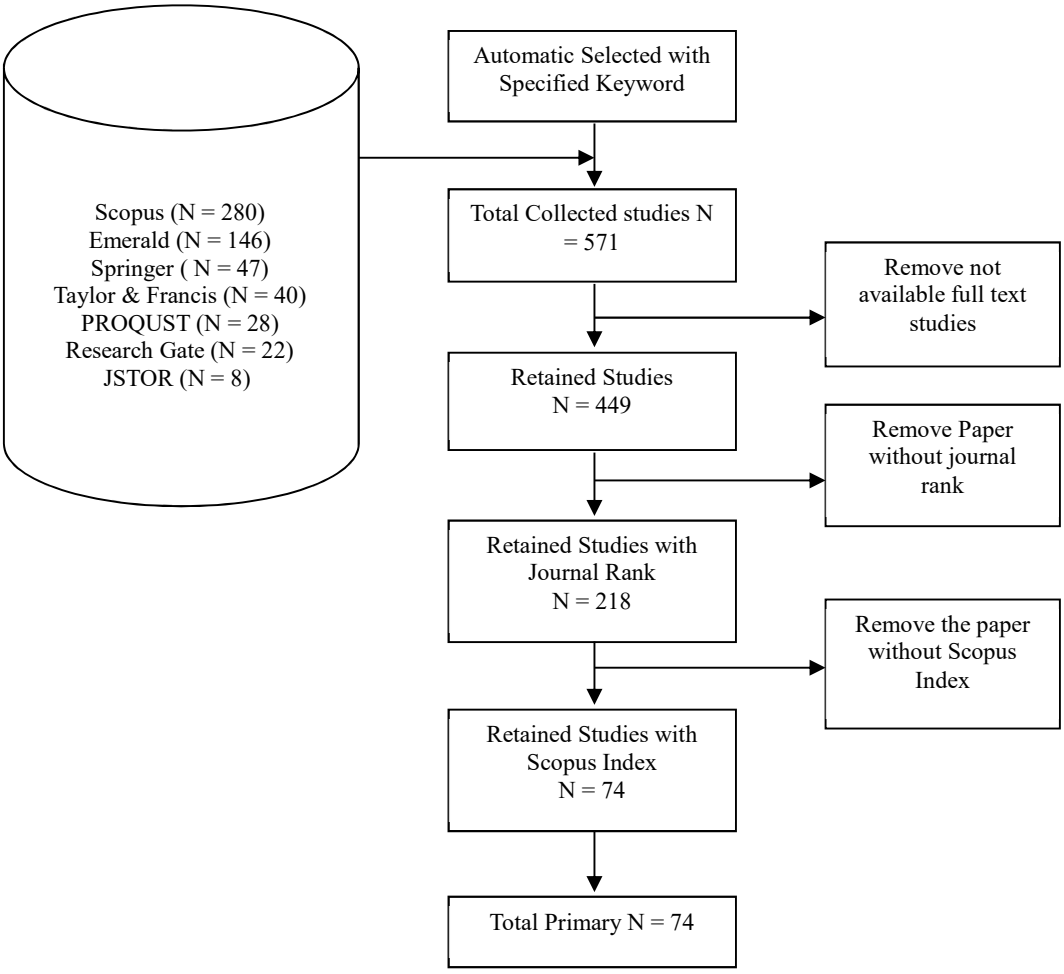

Figure 2. Search Strategy with Study Selection Procedures.

Data Selection Process

Following the completion of the data search process, a total of 571 articles were initially identified as potentially relevant to this Systematic Literature Review (SLR). Of these, 449 articles were available in full-text format, while the remaining 122 could not be used due to the lack of full-text access. Based on the inclusion criteria, 231 articles were excluded for not being published in journals ranked by Scimago. As a result, 218 articles remained with valid journal rankings. Subsequently, 144 articles were excluded for not being indexed in Scopus, leaving 74 articles that fully met the criteria and were deemed eligible for inclusion in this SLR.

Penilaian Kualitas

Evaluating the 74 chosen articles' overall quality is the goal of the quality evaluation procedure. Each of the following quality assessment (QA) requirements had to be met in order for the evaluation to be carried out:

QA1: Does the article's theme pertain to the topic of this systematic literature review?

QA2: Does the article explain the methods used to acquire the data?

QA3: Have all pertinent variables been correctly identified in the article?

QA4: Does the essay go over the resource requirements needed to gain a long-term competitive edge?

QA5: Is it feasible to achieve sustainable competitive advantage, according to the article?

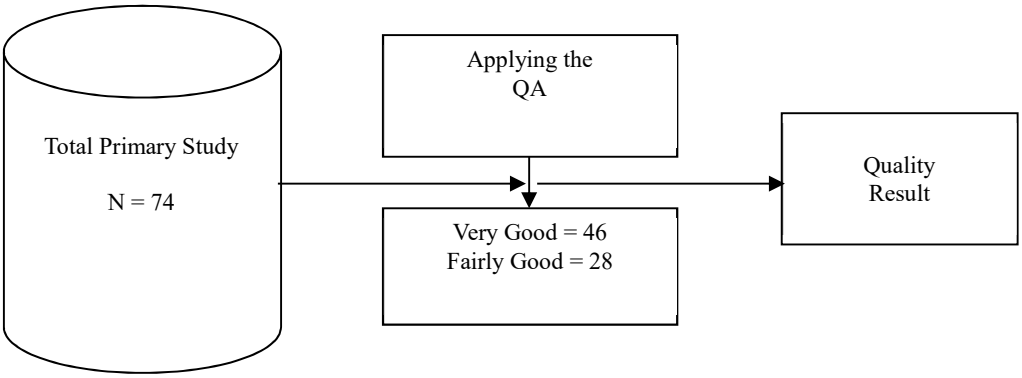

Figure 3. Quality Assessment Process.

The findings show that 74 articles were judged appropriate for the evaluation based on the quality assessment criteria. Of these, 28 articles were deemed to be of fairly good quality, and 46 articles were categorized as being of very good quality.

Extraction and Synthesis for SLR Data

All 74 publications that were identified as prospective sources of data for this systematic literature review were examined in their entirety in order to complete the extraction and synthesis process. In order to represent different categories, including year, author(s), nation, theoretical framework, title, methodology, findings, indexation, and an additional remarks column, columns representing these categories were built using Microsoft Excel's mapping approach. The authors used the notes column as a means of communicating their opinions about the suitability and relevance of each article's content with respect to the goals of this systematic review.

Findings and Discussion

Integration of Green Accounting into ESG Reporting Framework: Impact on Disclosure Quality and Corporate Assessment

It has been repeatedly demonstrated that the quality of sustainability disclosure is improved when green accounting is incorporated into the ESG reporting framework. The 'Environmental' part of ESG is strengthened by green accounting, which offers quantifiable measures of waste management, carbon emissions, and energy use. Research has indicated that reporting based on green accounting enhances the data's transparency, dependability, and relevance (Kazemi et al., 2023; Sun et al., 2024).

Standardization still faces several obstacles, nevertheless, especially given the variety of international reporting practices (Letiche & Boucaud, 2024). Thus, it is thought to be essential to harmonize standards like the GRI and the GHG Protocol (Latif et al., 2023; Kasperzak et al., 2023). However, this integration also affects the value of the company: better disclosure is linked to a better reputation in the market, a cheaper cost of capital, and a higher stock price (Chen et al., 2023; Adams et al., 2023; Firmansyah et al., 2023).

However, the issue of greenwashing is still a major worry. False or deceptive disclosures have the potential to damage a company's reputation and, eventually, its worth (Birindelli et al., 2024; Bingler et al., 2024). Consequently, it is now urgently necessary to make integrated and verified green accounting disclosures (Du Toit, 2024).

To What Extent Does Green Accounting Disclosure Affect Investor Decision Making and Perceived Corporate Risk

Green accounting disclosure plays a strategic role in shaping investment decisions and risk perceptions. Within the framework of signaling theory, high-quality disclosures serve as signals of managerial competence and long-term risk mitigation (Alduais, 2023; Cherkasova & Nenuzhenko, 2022). Investors rely on such data to assess a company's exposure to transition, physical, and reputational risks (Gao et al., 2021; Mazzarano et al., 2021).

Research also indicates that transparency on environmental issues can strengthen relationships with financial analysts and rating agencies, broaden analytical coverage, and improve market recommendations (Nazari & Poursoleyman, 2024). However, the quality of disclosure is a critical determinant. Poor or ambiguous disclosures tend to exacerbate information asymmetry and elevate perceived risk (Oppon et al., 2023; Soeprajitno et al., 2024).

Conversely, credible disclosures can reduce the cost of capital and facilitate access to financing (Darsono et al., 2025; Liu et al., 2022). Thus, green accounting disclosure functions not only as an external communication tool but also as an internal risk mitigation instrument.

The Role of Digital Technology in Improving the Effectiveness and Accuracy of Green Accounting Practices

Digital technologies play a crucial role in enhancing the effectiveness and accuracy of green accounting practices. IoT sensors enable real-time environmental data collection, while AI and big data analytics enhance analytical capabilities by detecting anomalies, predicting trends, and identifying critical environmental areas (Citterio, 2024; Wang et al., 2023).

Moreover, blockchain technology offers high data integrity through immutable record-keeping systems, which is essential for preventing greenwashing and fostering stakeholder trust (Chen et al., 2023; Alotaibi et al., 2024). Interactive dashboard-based visualizations also expand the accessibility and comprehension of ESG data among diverse stakeholders (Sun et al., 2024).

However, the adoption of such technologies requires significant investment and technical expertise, which remains unevenly distributed, particularly among SMEs (Setyaningsih et al., 2024). Data interoperability and information security challenges must also be addressed. Nonetheless, the direction of the literature indicates that the integration of digital technologies is becoming a prerequisite for an effective and credible future of green accounting (Witzel & Bhargava, 2023; Thomas et al., 2024).

Conclusion

This study conducts a Systematic Literature Review (SLR) to evaluate the roles, challenges, and opportunities of green accounting practices in supporting ESG reporting and sustainable decision-making. Based on an analysis of 74 Scopus-indexed articles published between 2021 and 2024, several key findings emerge that contribute significantly to both the literature and practice of sustainability accounting.

First, the integration of green accounting within the ESG framework has been shown to enhance the quality of environmental disclosure. However, its effectiveness is largely dependent on the presence of standardized reporting frameworks and the entity's ability to avoid greenwashing practices. These findings underscore the importance of regulatory harmonization and disclosure verification mechanisms to strengthen the credibility of

sustainability information.

Second, green accounting disclosures exert a substantial influence on risk perception and investment decision-making. Reliable and transparent data not only serve as positive market signals but also reduce information asymmetry and the cost of capital. In this context, the quality of disclosure becomes a key differentiator between firms that successfully leverage ESG as a value-driven strategy and those that merely fulfill normative compliance.

Third, digital technologies such as AI, IoT, and blockchain play a transformative role in green accounting practices. These technologies enhance the effectiveness of environmental monitoring, data validity, and transparency of reporting. While adoption challenges persist—particularly among SMEs—the literature indicates that digitalization represents an inevitable direction for the future of green accounting.

Overall, this research shows that green accounting is a strategic managerial approach to increasing business sustainability, bolstering stakeholder participation, and establishing credibility rather than just being a technical reporting tool. Therefore, in light of the worldwide movement toward a green economy and sustainable development, this study offers both theoretical and practical insights to reaffirm the importance of green accounting.

Limitations & Further Research

A literature-based methodology was used to perform this Systematic Literature Review (SLR). The information gathered includes summarized results from earlier research, however we made an effort to provide evidence that was supported by solid evidence. This SLR has limits, much like any other research, such as its reliance on secondary sources and difficulties in data processing and analysis. As a result, even if the approach used here was in line with previous research, some of the findings could need to be improved.

In order to obtain more reliable results, it is advised that future study address the limitations associated with data management and source selection in SLRs. Examples of this include using primary data sources and more thorough data analysis methodologies. Future research may also look into adding other factors to improve our understanding of green accounting methods in a variety of industries, such as talks about sustainable competitive advantage.

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