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Green Accounting In Sustainable Business Strategies: An Empirical Study Of Environmentally Friendly Startups In Indonesia

Ela Widasari¹, Muhammad Hasyim Ashari², Umarudin Kurniawan³¹ Universitas La Tansa Mashiro, Indonesia² Sekolah Tinggi Ilmu Ekonomi Indocakti Malang, Indonesia³ Politeknik Negeri Lampung, Indonesia

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Corresponding Author:

Author Name*: Ela Widasari

Email*:

ela.widasari@unilam.ac.id

Abstract: *This study aims to explore the meaning and implementation of green accounting in sustainable business strategies for eco-friendly startups in Indonesia. Increasingly pressing environmental issues are driving businesses, including startups, to integrate sustainability principles into their operations. Green accounting serves as a strategic instrument that enables structured recording, measuring, and reporting of environmental impacts. Using a qualitative phenomenological approach, this study explores the subjective experiences of startups who have implemented green accounting in various cities such as Jakarta, Bandung, Yogyakarta, and Bali. Data were obtained through in-depth interviews, observation, and documentation, then analyzed using the Colaizzi model. The results show that green accounting is understood not only as a reporting tool, but also as a manifestation of ethical values and ecological responsibility. However, its implementation still faces constraints such as limited resources, technical literacy, and regulations that are not yet optimally supportive. Nevertheless, opportunities for strengthening are open through digital technology, ESG-based funding, and multi-stakeholder collaboration. These findings confirm that green accounting plays a crucial role in green business transformation, while contributing to public policy, sustainable entrepreneurial practices, and the development of a more environmentally responsible startup ecosystem.*

Keywords: *Green accounting, Sustainability, Startup*



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INTRODUCTION

In the past two decades, the issues of climate change, environmental degradation, and overexploitation of natural resources have raised the urgency of adopting sustainable development principles across various sectors, including the business sector. Businesses now face increasing pressure from civil society, investors, and policymakers to take responsibility for the environmental impacts of their activities. The concept of sustainability in business is no longer merely normative but has become a strategic imperative. In line with these demands, environmental accounting, also known as green accounting, has emerged as an approach that enables companies to measure and report their environmental impacts in a structured and transparent manner (Ratnamiasih et al., 2022).

Green accounting, in a strategic context, offers a framework for integrating environmental costs and benefits into managerial decision-making processes. This approach not only records expenditures for environmental compliance or waste management but also calculates the economic value of both positive and negative environmental impacts, including energy efficiency, carbon emission reduction, and ecosystem restoration (Sudarminto & Harto, 2023). Therefore, green accounting is not merely supplementary financial reporting but rather a crucial instrument in planning and implementing business strategies oriented toward long-term sustainability. This aligns with the triple bottom line paradigm (economic, social, and environmental) increasingly adopted in the global business world.

Amidst the transition to a green economy, Indonesia is demonstrating positive dynamics through the growth of environmentally-based startups that prioritize innovation in products and business models. These startups emerge in response to environmental challenges and new market opportunities. They offer sustainable solutions ranging from waste management technology and organic farming to renewable energy. The presence of eco-friendly startups reflects a shift in values among young entrepreneurs, who are

focused not only on profit but also on sustainability (Ye & Dela, 2023). However, the success of these startups in integrating green accounting principles into their business strategies has not been comprehensively studied.

Despite the encouraging growth of green startups in Indonesia, the challenges of implementing green accounting remain significant. Many startups still operate on a small scale with limited resources, making it difficult to allocate time and resources to implement an adequate environmental accounting system. Furthermore, the lack of nationally integrated environmental accounting standards has led to diverse implementations, both in terms of measurement and reporting methodologies. This indicates a need for empirical research that can explore actual practices in the field and identify obstacles and opportunities for implementing green accounting in the local startup context (Wahyuni et al., 2019; Dura & Suharsono, 2022).

Empirical studies on green accounting in green startups in Indonesia are becoming increasingly important to address the existing literature gap. Contextual, primary data-driven research can provide a deeper understanding of the dynamics of green accounting implementation, particularly in the startup sector, which is still in its infancy. This approach can provide insights into the extent to which sustainability aspects have been internalized in the organizational structure and culture of young businesses in Indonesia, and how accounting practices support this process. Understanding the integration of green accounting into startup business strategies can make a strategic contribution to public policy and the development of a green business ecosystem in Indonesia. The government, through regulations and fiscal incentives, can formulate policies that encourage environmental accountability while providing space for startups to grow within a sustainable framework (Riski et al., 2025). Furthermore, investors and other stakeholders can utilize information from green accounting practices as

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a basis for making socially and environmentally responsible investment decisions.

On the academic front, green accounting in the context of eco-friendly startups also offers ample theoretical and methodological opportunities. This research can examine the relevance and adaptability of green accounting concepts in a developing economy like Indonesia, and propose a more inclusive and applicable approach for small and medium-sized enterprises. Thus, this study has the potential to produce findings that not only enrich the literature but also provide practical insights and contribute to the needs of the business world.

Considering the complexity of environmental challenges and the dynamics of startups in Indonesia, research on green accounting in the sustainable business strategies of eco-friendly startups is crucial. This study is expected to not only capture the reality on the ground but also provide constructive recommendations for improving the quality of environmental reporting, sustainable strategic planning, and strengthening the competitiveness of green startups in the circular economy era. The results of this kind of research can form the foundation for establishing business practices that are not only profitable but also responsible for the sustainability of the planet and future generations.

METHOD

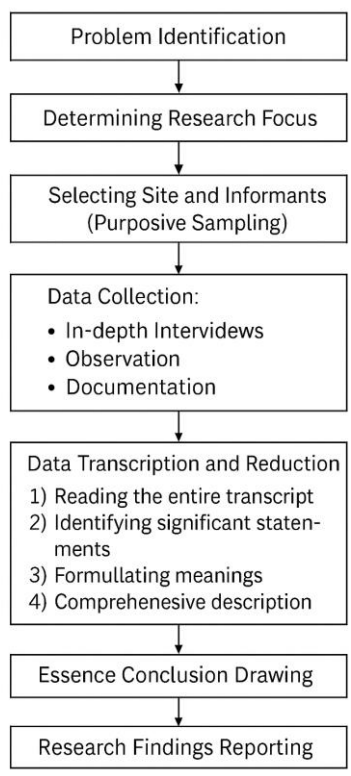
This study uses a qualitative approach with a phenomenological method to explore in-depth the experiences of environmentally friendly startups in Indonesia in implementing green accounting as part of a sustainable business strategy. Creswell (2013) states that a phenomenological approach is appropriate for understanding the meaning of individual life experiences regarding a particular phenomenon, which in this context is the practice of green accounting in sustainability-based startups.

The research locations focused on areas with green startup growth, such as Jakarta, Bandung, Yogyakarta, and Bali. Subjects were selected purposively with the following criteria:

(1) startups that have been operating for at least two years, (2) have a sustainability orientation, and (3) business actors directly involved in financial or operational planning.

Data collection techniques used in-depth semi-structured interviews, field observations, and documentation (financial reports, sustainability reports, and other supporting documents). All data were analyzed using Colaizzi's phenomenological model, which includes the process of identifying significant statements, formulating meanings, grouping themes, and compiling essential descriptions of participants' experiences. To ensure validity, source triangulation, member checking, and audit trails were used. Research ethics were maintained through informed consent, participant anonymity, and guaranteed data confidentiality. This research is expected to be able to explore the deeper meaning of green accounting practices in the sustainable business strategies of green startups in Indonesia.

RESEARCH FLOW DIAGRAM





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RESULTS AND DISCUSSION

1. Perception and Meaning of Green Accounting in Startup Business Practices

The perception and meaning of green accounting in the business practices of eco-friendly startups reflect subjective experiences rich in sustainability values. For startup founders and operators, green accounting is understood not only as a technique for recording environmental costs, but also as a form of moral and social responsibility to the ecosystem that supports the sustainability of their businesses. This perception stems from a deep ecological awareness, often influenced by personal experiences with environmental issues such as climate change, pollution, or environmental damage in their surroundings.

The motivation behind implementing green accounting does not solely stem from external forces such as regulatory or market demands, but rather is shaped by the intrinsic values of business actors (Latifah & Soewarno, 2023). In many cases, these values are embodied in the organization's identity and strategic direction, with environmental accounting positioned as a medium for realizing a broader vision of sustainability. This means that green accounting serves not only as a reporting tool but also as a philosophical representation of an ethical and sustainable business perspective.

However, positive perceptions of green accounting do not always translate into technical capacity to implement it comprehensively. Many startups admit they don't fully understand how to systematically measure, manage, and report environmental impacts. This gap highlights the need for technical literacy and mentoring in green accounting, so that established perceptions can develop into consistent and structured practices (Utomo et al., 2022).

Nevertheless, some startups have incorporated green accounting into their business communication strategies. They leverage environmental reporting to build trust with consumers, attract green investors, and strengthen brand reputation amidst increasingly environmentally conscious consumer trends.

Here, environmental accounting plays a dual role as a tool for measuring ecological performance and as a market differentiation strategy capable of providing competitive added value.

In the context of decision-making, information generated from green accounting practices is beginning to be used as a basis for designing more efficient and environmentally sound operational strategies. For example, data on emissions or waste management costs are used to evaluate project feasibility, select clean technologies, or identify business partners aligned with sustainability values (Gunawan et al., 2025). This practice indicates that green accounting has the potential to be integrated into strategic decision-making structures.

Furthermore, the perceptions formed contribute to the overall organizational culture of startups. For startups with a strong sustainability orientation, green accounting has become part of internal SOPs, work ethics, and even team performance evaluation criteria. Conversely, for those still in the early stages of understanding, green accounting remains symbolic and has not yet been internalized in the organization's daily activities (Ahmadin & Santono, 2025). This difference demonstrates that the internalization process occurs gradually, depending on the strength of values, leadership, and system support.

Externally, pressure from the market, community, and regulations has strengthened positive perceptions of the importance of environmental reporting. Amid growing global awareness of climate change, the existence of green accounting has become a crucial indicator of a startup's viability and acceptance within the broader business ecosystem (Dari & Sisdianto, 2024). When startups demonstrate environmental transparency and accountability, collaboration opportunities and access to funding increase.

Thus, the perception and interpretation of green accounting in startup practice is not merely a technical accounting issue, but a complex cognitive and social process. This interpretation is influenced by experiences, values, the organizational cultural context, and external dynamics that shape how startups



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position green accounting as part of their business identity, strategy, and legitimacy. Therefore, it is crucial for stakeholders to understand these perceptual dimensions as a foundation for developing policies, mentoring, or reporting systems that are more responsive to the real needs of green businesses.

2. Strategic Implementation of Green Accounting in Environmentally Friendly Startup Operations

The strategic implementation of green accounting in eco-friendly startups goes beyond simply recording environmental costs, but rather involves a comprehensive integration of sustainability principles and operational management. In the context of startups, which generally have limited resources, this approach demands high efficiency and adaptability to external environmental dynamics. Green accounting is used as a tool to facilitate decision-making based on accurate and relevant environmental data.

A concrete example of green accounting implementation can be seen in measuring carbon emissions generated by a startup's production processes or services. Several startups have integrated carbon footprint tracker software as part of their accounting information systems. This data is then used to determine mitigation measures such as energy source replacement, logistics efficiency, or supply chain adjustments. For example, startups in the sustainable logistics sector use emissions data to select low-carbon delivery routes and electric vehicle fleets (Celestin & Vanitha, 2020).

Furthermore, energy efficiency and waste management are other key indicators. Startups that implement green accounting tend to conduct regular energy audits and use the results to establish sustainability KPIs (Key Performance Indicators). Examples include the use of automatic sensors in cooling or lighting systems to reduce electricity consumption, as well as the implementation of circular economy principles in production waste, such as recycling organic waste into valuable by-products.

From a record-keeping perspective, green accounting allows startups to record environmental costs (environmental cost accounting), including prevention costs, remediation costs, compensation costs, and social costs. This creates transparency in financial reports and makes it easier for investors and stakeholders to assess a startup's sustainability commitment (Huang et al., 2020). Some startups also prepare Environmental Profit & Loss (EP&L) reports, which present an estimated environmental impact in monetary terms, as a basis for strategic decision-making.

Integration into business strategy is achieved through a triple bottom line approach (people, planet, profit), where success is measured not only by financial gains but also by social and environmental impact. Startups that adopt this approach typically innovate environmentally friendly products, such as those made from recycled materials, biodegradable products, or those with low-emission production processes (Foradori, 2023). Green technologies, such as the use of IoT for energy monitoring or blockchain for sustainable supply chain tracking, are also part of this strategy.

This strategic implementation must also consider startup limitations, such as limited capital, a lack of environmental expertise, or market pressures. Therefore, adaptations are made by establishing partnerships with NGOs, research institutions, or through incubation at institutions focused on green innovation. In some cases, startups utilize fiscal incentives and government regulations, such as tax deductions for green investments, as a financing strategy for implementing green accounting. Furthermore, systemic challenges such as the lack of standardized environmental accounting standards, minimal market awareness, and internal resistance also pose serious obstacles. To overcome these challenges, startups need to build a sustainability-based organizational culture supported by visionary leadership and ongoing employee training (Aristiyanti & Sisdianto, 2024). This strengthens the role of green accounting beyond simply a recording tool and as part of strategic environmental management.



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As stated by Schaltegger and Burritt (2018), green accounting in the context of small and medium-sized businesses should be seen as a "strategic connector" between environmental performance and economic decisions. Therefore, field practice shows that startups that successfully integrate green accounting into their daily operations tend to have higher competitiveness, stronger investor confidence, and a more stable market position in the green economy era.

3. Obstacles and Opportunities for Strengthening Green Accounting in the Indonesian Startup Ecosystem

The implementation of green accounting in the Indonesian startup ecosystem still faces various challenges, particularly internally. One significant obstacle is the limited human resources with specialized knowledge and expertise in environmental accounting. Many startups are still focused on product development and market expansion, so environmental impact reporting is not a priority. The lack of specialized training or competent professionals makes green accounting merely a catchphrase that cannot be fully operationalized.

Furthermore, budget constraints are a major barrier for startups implementing a comprehensive environmental reporting system. In the early stages, most startups must allocate funds for survival activities such as marketing, product development, and basic operations. Green accounting practices, which require specialized measurement tools, training, and technology, are considered an additional burden that does not directly benefit revenue (Fahreza et al., 2024). Therefore, startups tend to prioritize sustainability reporting as a secondary priority.

Externally, regulatory ambiguity also acts as a hindering factor. Indonesian regulations regarding environmental accounting remain normative and do not yet establish specific technical standards or reporting frameworks for the startup sector (Sudaryana et al., 2025). As a result, many startups struggle to identify relevant environmental parameters for reporting.

Without strong and targeted regulatory support, green accounting implementation will tend to be sporadic and unstandardized, often becoming little more than a formality.

Market and public awareness of green business practices is also still developing slowly. Although sustainability trends are gaining traction, most consumers in Indonesia still prioritize price and product functionality over environmental impact. This situation has led to low market demand for green accounting (Wigayha et al., 2025). Similarly, investors, particularly in the startup sector, tend to focus on growth potential and valuation, rather than environmental impact reporting (Nugrhanto et al., 2025).

Nevertheless, opportunities to strengthen green accounting remain wide open through synergy between businesses and various actors within the startup ecosystem. Currently, funding programs from ESG-based venture capitalists, green startup incubators, and support from ministries such as the Ministry of Industry and the Ministry of Environment and Forestry (KLHK) are emerging. These initiatives are opening new opportunities for startups to view green accounting not merely as an obligation but as part of a competitive differentiation and value-added strategy.

This strengthening can be expanded through multi-stakeholder collaboration involving government, industry players, research institutions, and civil society. This collaboration can focus on developing environmental reporting standards tailored to startup characteristics, developing technical guidelines, and providing integrated learning platforms. The principle of co-creation is a strategic approach to combining diverse perspectives and resources to create a reporting system that is adaptive and easily accessible to young entrepreneurs (Firdaus & Anisa, 2025).

Furthermore, the use of digital technology offers significant breakthroughs to support the implementation of green accounting. Digital systems such as cloud-based accounting software, emissions monitoring applications, and AI-based analytics can be used to simplify real-time environmental impact reporting. In addition to

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reducing administrative burdens, technology also opens up opportunities for engaging and communicative environmental data visualizations for external stakeholders.

To ensure the sustainability of this transformation, more strategic policy interventions are needed, including providing fiscal incentives for startups that adopt environmental reporting and integrating green accounting into higher education curricula and vocational training. With a collaborative approach, regulatory support, and the use of technology, strengthening green accounting in Indonesian startups will not just be a topic but can be realized as a foundation for more inclusive and sustainable green economic growth.

CONCLUSIONS

The perception, strategic implementation, and obstacles and opportunities for green accounting in the business practices of environmentally friendly startups in Indonesia demonstrate that green accounting is not merely an accounting technique but a reflection of sustainability values embedded in the consciousness of business actors. The meaning of green accounting is rooted in ethical and social incentives that lead to comprehensive ecological responsibility. In practice, green accounting becomes an integral part of operational strategies and decision-making based on environmental data. Startups that successfully integrate these principles demonstrate increased efficiency, competitiveness, and market legitimacy. However, limited human, technical, and budgetary resources are major obstacles to comprehensive implementation. Regulatory ambiguity and low market awareness also slow the systemic internalization of green accounting. Nevertheless, opportunities for strengthening are open through external support such as ESG funding, green incubators, and cross-sector collaboration. Digital technology is a crucial catalyst in simplifying reporting and increasing stakeholder engagement. Therefore, a strategic approach involving affirmative policies, education, and digitalization is

urgently needed to strengthen the green accounting ecosystem among startups. Ultimately, green accounting has the potential to become a key instrument in realizing a more inclusive, strategic, and sustainable green business transformation.

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