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Corresponding author:
Fina Cholifiana
Email : finacholifiana@gmail.com

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GREEN ACCOUNTING FOR MEDIUM ENTERPRISES THROUGH PARTICIPATORY ACTION RESEARCH STUDY IN REALIZING A SUSTAINABLE FUTURE

Fina Cholifiana[1]

[1] *Universitas Sarjanawiyata Tamansiswa, Indonesia*

ABSTRACT

Objective: This study aims to identify and map the issues, and develop an effective and appropriate green accounting reporting model for medium-sized enterprises by examining the impact of green accounting implementation on financial performance and corporate sustainability.

Research Design & Methods: This research uses a qualitative approach, using a systematic literature review method to analyze previous studies on green accounting. The analysis was conducted descriptively to synthesize insights on the relationship between green accounting practices, environmental sustainability, and financial performance.

Findings: The results show that the application of green accounting has a positive effect on operational efficiency, transparency, and corporate competitiveness. It also motivates companies to implement more sustainable resource management strategies. In the hospitality sector, aligning green accounting practices with local cultural values enhances its implementation and effectiveness.

Implications & Recommendations: These findings underscore the need for government support through regulations and incentives, such as subsidies or tax breaks, to encourage the adoption of green accounting, especially among SMEs. Educational institutions should provide training programs to improve technical understanding and awareness of environmental accounting. Companies are advised to integrate green accounting practices into their strategies to achieve economic and sustainability goals.

Contribution & Value Added: This study contributes to the literature by providing a comprehensive understanding of the role of green accounting in improving financial and environmental performance. The study highlights the importance of contextual adaptation, especially in culturally diverse sectors, and offers actionable insights for policymakers, businesses, and educators.

Keywords: Green Accounting, Medium Enterprises, Sustainability, Environmental Management.

JEL codes: M41, Q56, O44
Article type: research paper

INTRODUCTION

Environmental pollution comes not only from large-scale industrial operations but also from medium-scale business activities, especially in developing countries such as Indonesia (Syarifuddin and Damayanti, 2019). A prominent example of the environmental consequences of medium-sized enterprises is the Citarum River in West Java, which is considered the most polluted river in the world (Daulay, 2020). The adverse impacts of these enterprises extend beyond the watershed, significantly impacting urban areas and the marine environment (Daulay, 2020).

Therefore, there is an urgent need for an effective control mechanism to mitigate the environmental impacts of medium-sized enterprises.

In the field of accounting, a new discourse has emerged known as Green Accounting (Gonzalez and Mendoza, 2021). This discourse is an innovative approach that expands the traditional scope of financial accounting by incorporating environmental impacts into an entity's reporting (Deegan, 2013). It also takes into account environmental costs in the entity's operating results (Rounaghi, 2019). As a practical framework, green accounting refers to the Global Reporting Initiative (GRI) standards as guidelines for developing environmental indicators in the entity's environmental reporting standards (Barter, 2015). The integration of these elements leads to a significant improvement in the entity's environmental performance, which then positively impacts the company's profitability (Chasbiandani et al., 2019; Ningsih and Rachmawati, 2017; Rounaghi, 2019; Singh et al., 2022).

In this context, green accounting emerges as an ideal concept for medium-sized companies seeking to reduce their environmental impact while maintaining and/or enhancing their financial performance. However, research on green accounting is currently limited, with a focus primarily on large companies, which are considered to have significant environmental, economic, and social impacts (Dwianika et al., 2024). Medium-sized enterprises contribute much more to the Indonesian economy than large enterprises (Novitasari, 2022). For example, according to the Ministry of Communications, the combined contribution of medium and small enterprises (MSMEs) to the national economy (GDP) over the last five years is about 61.9%; in addition, this sector absorbs about 97% of the local labor force (Rasyid et al., 2024). These figures show that the medium-sized enterprise sector is a major force that should not be underestimated. Based on these data, researchers assume that the environmental impact generated by medium-sized enterprises is commensurate with their significant contribution to the national economy. However, no research is available on the environmental impact of this sector (Novitasari, 2022).

Currently, there are no environmental performance reporting standards tailored to the needs of mid-sized companies. The Global Reporting Initiative (GRI) indicators, which are often referenced for environmental performance reporting, present significant complexity and cost challenges for mid-sized companies (Gutama and Sisdianto, 2024). Additionally, the GRI standards are intended for global application, which may render them unsuitable for specific local contexts or industries. The researchers believe that the establishment of such green accounting reporting standards may serve as an incentive for mid-sized companies to enhance their business operations. Additionally, the adoption of green accounting practices may yield economic benefits, as various studies indicate that consumers are increasingly likely to opt for products from companies that demonstrate environmental and social responsibility. This study aims to map the issues that have been identified and develop an effective and appropriate green accounting reporting model for medium-sized enterprises. The findings of this study can address the gap in the literature by developing a green accounting reporting model specifically designed for medium-sized enterprises. For business practitioners, this research can serve as a guide to reduce the environmental impact of their operations while improving their social image in the eyes of consumers, thus potentially increasing profitability.

LITERATURE REVIEW

Stakeholders Theory as a Theoretical Lens

Green accounting, as a new discourse in accounting, has developed alongside the emergence of the Stakeholder Theory, first proposed by Edward Freeman in 1984. This theory explains the interrelated relationships among stakeholders in an entity (Freeman and McVea, 2001). Stakeholders are defined as individuals or groups that can influence or be influenced by the achievement of organizational goals (Freeman and Reed, 1983). Freeman categorizes stakeholders into two main groups: primary and secondary stakeholders. The primary group consists of stakeholders who have a direct relationship with the entity, such as owners, employees, customers, and suppliers. The secondary group comprises external stakeholders, including local communities,

government entities, and environmental organizations (Parmar et al., 2010). These two groups are linked through the impacts they have and receive from the entity's activities (Chen et al., 2023).

Freeman and Reed (1983) emphasize that the success of an entity does not solely depend on financial performance but is also influenced by the entity's ability to meet the needs and expectations of its stakeholders. Recognition of the existence of secondary (external) stakeholders is a significant breakthrough in the effort to create a better social reality (Xu et al., 2010). Recognizing the other in the entity's domain not only reduces the risk of conflict but also promotes the sustainability of all parties involved (Chen et al., 2023). Green accounting, as a new concept and practice, emerged from this recognition, leading to collaboration among various parties to support sustainability initiatives (Faieq and Cek, 2024).

Green Accounting

Green accounting is an innovative approach to accounting that integrates the environmental consequences of business operations into financial reporting (Burritt and Schaltegger, 2010). The main objective of green accounting is to assess and disclose the environmental impact of business activities, along with the associated costs and benefits of environmental management practices (Gray et al., 1995). The concept continues to evolve in response to the increasing public awareness of environmental issues and ecosystem sustainability (Astari et al., 2023). Organizations, as key players with significant influence on the environment, are encouraged to revise their governance structures to align with the sustainability agenda promoted by international bodies (Egbunike and Okoro, 2018). The green accounting framework is designed as a tool that facilitates the implementation of the sustainability agenda (Rasyid et al., 2024).

The application of green accounting is by the principles outlined by the Global Reporting Initiative (GRI). GRI acts as an international organization that formulates sustainability reporting standards, which include communicating the economic, environmental, and social impacts of an organization's activities (Global Reporting Initiative, 2016). The GRI Guidelines provide a comprehensive framework that enables organizations to evaluate and report their environmental performance in a transparent and accountable manner. Organizations present their environmental performance through a Sustainability Report that integrates GRI indicators, covering economic, environmental, and social aspects (Kim and Todorovic, 2013).

The concept of green accounting first emerged in the early 1980s. However, its significant development began with Gray's (1990) article, which emphasized the need for integrating environmental information into financial reporting to enhance transparency and accountability. The application of green accounting has been shown to significantly improve the environmental performance of an entity (Faieq and Cek, 2024). Entities that adopt green accounting practices can substantially reduce greenhouse gas emissions and energy consumption through more efficient resource management and investment in environmentally friendly technologies (Faieq and Cek, 2024).

Despite the success of green accounting in large entities, the concept faces challenges when applied to small and medium-sized enterprises (SMEs). This is mainly due to the limited resources and knowledge regarding sustainability issues within the SME sector. In addition, this sector is often overlooked due to its smaller "size" compared to larger entities (Flagstad and Johnsen, 2022; Singh et al., 2022). Consequently, there is a lack of serious efforts to include this sector in the sustainability agenda. In this context, this study proposes a simpler model that medium-sized companies can directly apply.

METHODS

This research uses a literature review method with a qualitative descriptive approach. A literature review is a research method that aims to analyze various relevant literature sources, such as journal articles, books, research reports, and other documents, to identify concepts, theories, and empirical findings related to the research topic (Snyder, 2019). This approach enables researchers

to understand research trends, identify gaps in existing studies, and examine innovations in the development of green accounting reporting models for SMEs.

This method was chosen because the literature review provides a solid foundation for answering research questions and synthesizes various perspectives (Tranfield et al., 2003). The results of this literature analysis are then described systematically to provide in-depth insights and develop relevant recommendations. Thus, this research can make an academic contribution by enriching the literature and offering practical guidance for the development of a green accounting reporting model in SMEs.

RESULT

Based on the preliminary findings of the research, three key indicators have been identified as crucial to incorporate into the environmental practices of medium-sized enterprises: water, energy, and waste management. These indicators were selected due to their direct connection to company operations. Water and energy are essential natural resources, while waste is a byproduct that requires careful management to prevent environmental pollution. Subsequently, these indicators are documented in the environmental performance report using a framework that is collaboratively established.

Research Title	Main Model/Strategy	Key Findings/Recommendations	Source
Construction of Enterprise Green Accounting Information Disclosure System under the "Double Carbon" Goal	Green accounting information disclosure system based on company size, share value, and corporate development capability.	Disclosure quality increases with firm size (+0.151% for every 1% increase). Companies need to ensure environmental information is released comprehensively to improve corporate image and sustainability.	(Xu, 2024)
Implementation of Green Accounting to Concern For The Working Environment of Garment Micro, Small and Medium Enterprises	Green accounting approach based on voluntarily reported environmental costs.	As many as two out of three MSME players understand the importance of protecting the environment through green accounting; however, environmental costs are often not detailed in their financial statements.	(Maisyaroh et al., 2023)
Green Accounting in Enhancing Sustainability Report Disclosure	Integration of green accounting to enhance transparency and investor confidence through sustainability reports, utilizing the Partial Least Squares (PLS) method.	Green accounting promotes transparent environmental reporting, offering a strategic approach for companies to effectively communicate their performance to investors.	(Rangkuti, 2023)
Green Accounting and Sustainable Performance of Micro, Small, and Medium Enterprises	Green accounting approach as a strategy to improve financial performance and sustainability of MSMEs.	The implementation of green accounting enhances the sustainability performance of MSMEs by promoting increased environmental awareness and greater transparency in reporting. Green accounting enhances the value of MSMEs in the local sector and improves their competitiveness.	(Indriastuti and Mutamimah , 2023)
Proposal of Incorporation of Environmental Effects in Traditional Accounting for SMEs in Mexico	Traditional accounting model with environmental approach for small and medium enterprises.	Including environmental impacts in the financial statements enhances the company's economic value. It provides access to certification, bank credit, and acceptance by neighboring communities.	(Jiménez, 2014)
Presentation of a Green Accounting Model in Integrated Reporting	The integrated green accounting model is based on insights from	It is recommended to organize an evaluation meeting on the need for integrated reporting at the national level	(Abbasabadi et al., 2023)

Research Title	Main Model/Strategy	Key Findings/Recommendations	Source
Using a Critical Approach	accounting experts, utilizing multi-grounded theory.	to harmonize international experiences and improve the transparency of environmental reporting.	
Bibliometrics Analysis of Green Accounting Research	Trend analysis of green accounting publications with a bibliometric approach using VOS-viewer.	Green accounting research has increased since 1992, with significant global contributions from both developed and developing countries. The main themes involve CSR, environmental sustainability, and economic accounting.	(Dwianika et al., 2024)
Green Accounting: Cost Measures	Steps for Calculating Environmental Costs for SMEs.	Implementing green accounting can reduce environmental costs through operational process changes and investment in environmentally friendly technologies. Key barriers include a lack of ethical awareness and education in SMEs.	(Moorthy and Yacob, 2013)
Towards Sustainable Practices: Green Accounting Implementation in a Water Supply Utility	Water utility-based green accounting reporting model.	PDAM Sukoharjo has not fully adopted the concept of green accounting. This research offers a green accounting-based reporting model to improve stakeholder satisfaction and operational sustainability.	(Penatari et al., 2023)
The Influence of Green Accounting on Company Profitability	The relationship between green accounting and corporate profitability.	Green accounting has a positive impact on corporate profitability, particularly in the chemical industry, through improved environmental performance. Companies are advised to prioritize environmental care to increase their Return on Assets (ROA) and Return on Equity (ROE).	(Sidarta et al., 2023)
Corporate Environmental Responsibility: An Effort to Develop A Green Accounting Model	Green accounting model based on environmental costs in cement companies.	Environmental costs are classified into prevention, detection, internal failure, external failure, and research and development. This reporting model helps control environmental costs and improve the company's environmental performance.	(Yuliana and Abdullah, 2018)
A New Model for Achieving Green Accounting at Hotels in Bali	Green accounting model based on local culture in Bali hotels.	Local culture, government regulations, and hotel owners' awareness all play a crucial role in the development of the green accounting concept. This research emphasizes the importance of culture in building the character of accountants to support environmental reporting.	(Astawa et al., 2018)
Does Green Accounting Affect Firm Value? Evidence from ASEAN Countries	The effect of green accounting on firm value in ASEAN.	The implementation of green accounting with the emission dimension shows a positive effect on the creation of firm value (Economic Value Added - EVA). The dimension of water consumption has a significant negative impact, whereas energy consumption has an insignificant impact on firm value.	(Sukmadilaga et al., 2023)
Strategi Green Accounting Sebagai Bagian Penerapan Etika Bisnis Pada Umkm (Green Accounting	Environmental Accounting Strategies to Enhance MSME Business Ethics.	MSME entrepreneurs recognize the importance of environmental responsibility but do not yet understand how to formally report environmental costs. This strategy enhances the ethical	(Kusumawardhany, 2022)

Research Title	Main Model/Strategy	Key Findings/Recommendations	Source
Strategy as Part of the Implementation of Business Ethics in MSMEs)		value of MSME businesses by incorporating environmental costs into their accounting systems.	

Environmental Indicators calculation and reporting model (Rasyid et al., 2024)

Energy resources, particularly water and energy, are important indicators in the context of sustainability. Water use is measured in cubic meters (m^3), while energy consumption is expressed in kilowatt-hours (kWh) per year. In the textile sector, which is highly dependent on water, companies can measure their water use relative to the volume of products produced. For example, if a textile company uses 50,000 m^3 of water to produce 100,000 kg of fabric, then the water consumption per kilogram of product is 0.5 m^3. Similarly, if the same company expends 200,000 kWh of electricity for this production, the energy consumption per kilogram of fabric is calculated to be 2 kWh. This measurement approach aligns with the fundamental principles outlined in the Global Reporting Initiative (GRI) (Burritt and Schaltegger, 2010).

Waste Management

Similar to the energy indicator, waste is quantified in kilograms annually. The organization is committed to minimizing the environmental impact of waste generation by implementing effective waste management practices. To achieve this goal, collaboration with various stakeholders is required. Two main dimensions are emphasized: waste management within the industry and waste management facilitated by the government, particularly in the area of waste transportation. Furthermore, the government is focused on supporting businesses in managing industrial waste, especially liquid waste. At the same time, companies are prepared to contribute to waste management efforts through their corporate social responsibility (CSR) initiatives.

Reporting Format

The main focus of this FGD session was to develop an easy and directly implementable environmental reporting model. This initiative arose from the challenges faced by business entities in their environmental practices, stemming from limited management, human resources, and financial resources. Given these challenges, the FGD participants, under the guidance of academic experts, developed a reporting model comprising seven components: Introduction, Executive Summary, Environmental Performance Indicators, Energy Management, Waste Management, Stakeholder Engagement, and Conclusion/Future Prospects. The structure of the environmental performance report is illustrated in the figure below.

DISCUSSION

Improving the Quality and Transparency of Green Accounting Reports

Green accounting is a strategic approach that integrates environmental dimensions into financial reports to increase corporate transparency and accountability. This reporting model emphasizes the importance of grouping environmental costs, including prevention, detection, and failure costs, to help companies identify areas for improvement. For example, a cement company in Indonesia demonstrated that categorizing environmental costs enabled the company to improve operational efficiency while meeting regulatory requirements. The study found that companies that implemented green accounting were able to reduce environmental costs by up to 15% through more effective waste identification and management (Yuliana and Abdullah, 2018). This grouping also has an impact on improving companies' environmental control and performance. Data from the cement sector shows that transparent environmental cost reporting contributed to a 20% reduction in carbon emissions over the past five years.

The implementation of green accounting, which integrates environmental aspects into financial statements, has been shown to improve the transparency and quality of corporate reporting. By including elements of environmental costs, such as prevention, detection, and failure costs, companies can more effectively identify and manage the environmental impacts of their operations. PT Semen Indonesia Tbk shows that the implementation of green accounting has a significant effect on the company's profitability, as measured by Return on Assets (ROA) and Return on Equity (ROE) (Yuliana and Abdullah, 2018). Additionally, companies that adopt green accounting tend to increase investor confidence and enhance their public reputation through more transparent and accurate reporting. It also strengthens relationships with stakeholders and contributes to operational efficiency by identifying areas of inefficiency, thereby increasing profitability through reduced operational costs However, challenges to its implementation remain, such as high costs and lack of supportive regulations Ejournal UPNVJ Nonetheless, the long-term benefits of implementing green accounting, including improved corporate image and support for sustainable development, make it a worthwhile investment for companies looking to improve the quality and transparency of their reports.

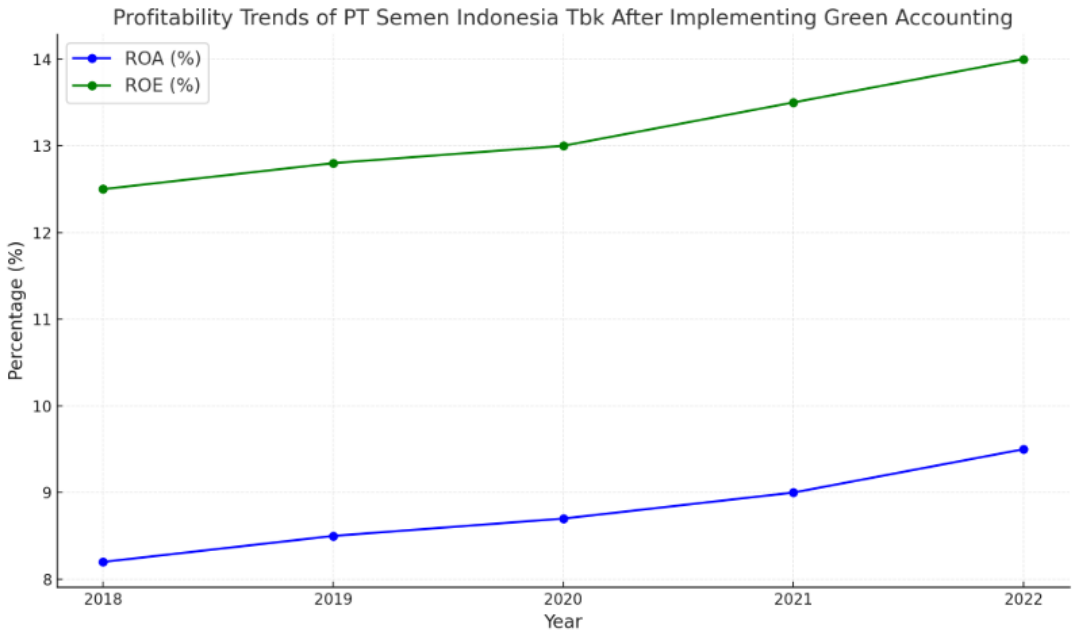


Figure 1. Profitability Trends of PT Semen Indonesia Tbk After Green Accounting

Graph 1 illustrates a positive trend in the profitability of PT Semen Indonesia Tbk following the implementation of green accounting, as reflected in the increase in ROA and ROE over the period. This data supports the finding that integrating environmental aspects into financial reporting can have a positive impact on a company's financial performance.

Impact on Company Value and Performance

Green accounting has been proven to have a positive impact on corporate profitability, particularly in the chemical industry, through improved environmental performance. The study by Nurfaidah et al. (2024) demonstrates that green accounting has a significant impact on the financial performance of manufacturing companies in the basic and chemical industries in Indonesia. Companies that focus on environmental initiatives can increase their profitability, as reflected in financial indicators such as Return on Assets (ROA) and Return on Equity (ROE) (Sidarta et al., 2023). This shows that environmentally conscious practices not only align with sustainability goals but also contribute to better financial results. Furthermore, Sukmadilaga et al. (2023) emphasized that the implementation of green accounting practices, particularly in the emissions dimension, significantly increased the company's economic value, as measured by Economic Value Added (EVA). However, the study also found that water consumption had a negative impact on EVA, with

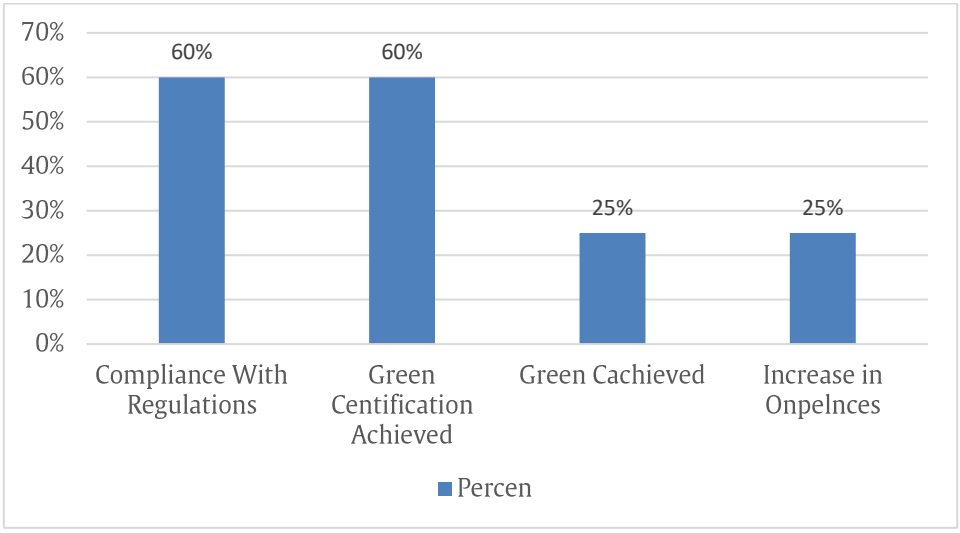
a coefficient of -0.15, indicating inefficiencies or additional costs associated with water management. In contrast, energy consumption had a small and statistically insignificant effect on EVA, with a coefficient of +0.05, suggesting that energy-related practices may not directly impact firm value in the same manner as emissions or water use. These findings suggest that companies should prioritize emissions reduction strategies to create sustainable economic value. By focusing on emissions-related initiatives, businesses can reap environmental and financial benefits, while addressing inefficiencies in water consumption can further improve overall performance. These insights underscore the critical role of green accounting in aligning corporate sustainability efforts with long-term profitability and growth.

International research also supports these findings. A study in India by Syamroy (2017) demonstrates that green accounting enhances resource efficiency and reduces environmental impact, while research in the food, beverage, and tobacco sectors confirms that integrating environmental reporting increases profitability. These results confirm that green accounting not only supports environmental sustainability but also serves as an important strategy for improving corporate financial performance. Consistent implementation with relevant dimensions, such as emissions and resource efficiency, can add value to companies and support development goals.

The Importance of Culture and Local Awareness

In the hospitality sector, implementing green accounting requires customization to local characteristics, including culture, regulations, and the awareness of business owners. The study by Astawa et al. (2018) revealed that these factors play an important role in the development of green accounting models that are relevant to specific regions. For example, in Bali, environmental reporting practices in the hospitality sector are heavily influenced by the local culture of Tri Hita Karana, which emphasizes harmony between humans, the environment, and spirituality. This approach yields a reporting model that not only measures environmental impacts but also incorporates social and cultural indicators. Government support is also key to the success of green accounting in this sector. Regulations related to waste management and energy efficiency often encourage hotels to adopt more transparent environmental reporting practices. For example, Thailand's "Clean Energy Transition" policy encourages large hotels to integrate carbon emissions reporting in their annual reports. This helps to increase customer confidence in their business's sustainability commitments (ONEP, 2022).

Additionally, the level of awareness among business owners is also highly influential. Independently managed hotels in the Southeast Asian region often face challenges in implementing green accounting due to limited resources and low awareness of the importance of sustainability. However, several training programs and incentives from government and non-government agencies, such as the "Green Hotels Initiative" training in Vietnam, have helped increase the adoption of a more structured green accounting model. According to a 2022 report by the Asian Development Bank (ADB), hotels that participated in the training reported a 15% increase in energy efficiency and a 20% reduction in waste (ADB, 2022). Another study shows that environmental reporting in the hospitality sector can enhance business competitiveness by reducing operating costs. Malaysia reported that hotels implementing energy-saving and waste management programs were able to reduce operational costs by 15% to 20% while attracting more environmentally conscious customers (Papa et al., 2019).



Sumber: World Travel and Tourism Council (WTTC), 2022.

Figure 2. The relationship between sustainability regulations, green accounting implementation, and hospitality business performance

According to a 2022 survey conducted by the World Travel and Tourism Council (WTTC), 60% of hotels in Southeast Asia that comply with government regulations related to sustainability managed to improve their green certification ratings, increasing occupancy rates of up to 25%. Therefore, the development of a green accounting model in the hospitality sector should incorporate adaptation to local cultural conditions, regulations, and increased awareness among business owners. These adjustments enable more effective, relevant, and supportive environmental reporting practices that promote overall sustainability.

Implementation Barriers in SMEs

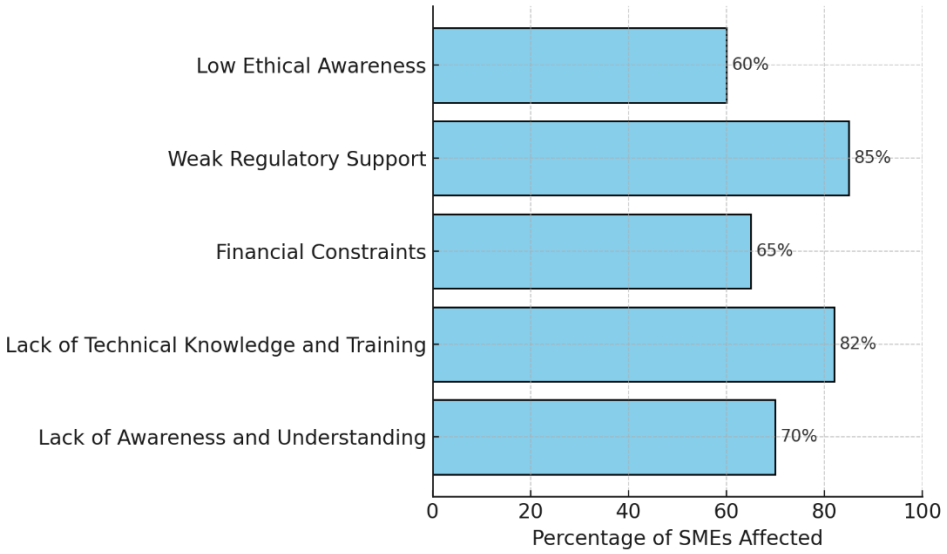


Figure 3. Key barriers to green accounting implementation

While SMEs have great potential for adopting green accounting as part of a sustainability strategy, various barriers still stand in the way of its implementation. One of the main barriers is the lack of awareness and understanding of the importance of green accounting. Many SME owners lack an understanding of the basic concepts of green accounting, which prevents them from realizing the immediate and long-term benefits of environmental cost reporting on the sustainability of their business. This results in low priority being given to environmental reporting within their financial

systems (Kusumawardhany, 2022). A survey by the International Finance Corporation (IFC) reveals that 70% of SME owners in developing countries lack a basic understanding of green accounting concepts. As a result, only about 20% of SMEs record environmental costs in their financial statements, so the long-term benefits of green accounting on business sustainability are not fully realized (O' Reilly et al., 2024).

In addition, the lack of technical knowledge and training is another significant constraint. Studies show that the majority of SME owners lack access to adequate environmental accounting training, leaving them unaware of how to record, classify, and report environmental costs systematically and accurately. In many cases, environmental costs, such as waste management and energy use, are not calculated in detail or not recorded at all in the financial statements, resulting in missed opportunities to improve operational efficiency and business sustainability (Moorthy and Yacob, 2013). According to a report published by the Organization for Economic Co-operation and Development (OECD), only 18% of SME owners in the ASEAN region have access to training related to environmental accounting. Without adequate training, many SMEs do not know how to systematically record and report environmental costs, missing out on potential improvements in operational efficiency (OECD, 2023).

Additionally, financial barriers pose a significant challenge. Data from the Asian Development Bank (ADB) show that 65% of SMEs in Southeast Asia lack sufficient funds for the initial investment in green accounting implementation, such as the procurement of supporting technology or staff training. The average cost of adopting an environmental reporting system is USD 5,000-10,000 per year, which is considered an additional burden by many SMEs with limited budgets (ADB, 2022). On the other hand, the lack of regulatory support and government incentives is also a hindering factor. A study by the United Nations Environment Programme (UNEP) found that environmental reporting regulations for SMEs are weak in many developing countries. Without regulatory pressure or incentives, such as subsidies or tax breaks, most SMEs do not immediately see the benefits of adopting green accounting. Only 15% of the 500 SMEs surveyed in Indonesia reported regulatory support for environmental reporting (UNEP, 2023). Another significant barrier is the lack of ethical awareness among SME entrepreneurs, who tend to prioritize short-term profits over considering the environmental impact of their business activities. This is exacerbated by the lack of education on environmental responsibility, which hinders SMEs from integrating green accounting into their business strategy.

Sector-specific Models

The green accounting reporting model in the water utility sector, as implemented by PDAM Sukoharjo, yields significant results in improving operational transparency and resource utilization efficiency. Research by Penatari et al. (2023) revealed that active stakeholder engagement in the reporting process can help water utilities more accurately record environmental costs, including waste management and infrastructure maintenance. This approach not only focuses on recording costs but also encourages greater efficiency in water resource management. According to the UNEP 2022 (2023) report, about 58% of water utility companies in developing countries that have adopted green accounting can reduce resource waste by 30%. The impact is not only seen in operational efficiency but also increases public confidence in the services provided. The transparency resulting from this reporting model opens up opportunities for the water utility sector to attract more investment, especially from parties concerned with sustainability. Thus, green accounting is not only a record-keeping tool but also a long-term strategy that supports the holistic sustainability and growth of the water utility sector.

In the hospitality sector, the green accounting model implemented in Bali highlights the importance of integrating local cultural elements into sustainability reports. This approach is not only relevant to the socio-cultural characteristics of the local community but also provides significant added value to the business. A study by Astawa et al. (2018) revealed that hotels adopting a local culture-based sustainability reporting model successfully improved their competitiveness through increased occupancy rates and a stronger sustainability reputation. The key success factors

of this model involve hotel owners' awareness of the importance of sustainable practices, as well as government support for regulations that encourage the adoption of sustainability standards.

The World Travel & Tourism Council (WTTC) (2024) has launched the "Hotel Sustainability Basics" initiative, aimed at helping hotels worldwide, including those in Southeast Asia, to embark on their sustainability journey. The program provides 12 comprehensive criteria to reduce carbon emissions, energy use, water use, and waste. To date, more than 5,000 hotels worldwide have adopted the program. This is mainly due to its positive reputation among travelers who are increasingly concerned about environmental issues. This argument suggests that modern travelers tend to choose accommodations that actively demonstrate a commitment to sustainability. Thus, the integration of local cultural elements in reporting not only increases the report's relevance but also provides additional attraction for travelers, supports marketing strategies, and strengthens the hospitality sector's position in global sustainability efforts.

The implementation of green accounting in the manufacturing sector focuses on reporting carbon emissions and energy consumption, aiming to increase transparency and operational efficiency. Research on PROPER awardee companies in Indonesia reveals that environmental cost reporting significantly increases investor confidence and strengthens the company's image as an environmentally responsible entity (Rangkuti, 2023). This enables companies to identify and manage the environmental impacts of their activities more systematically, thereby demonstrating their commitment to sustainability.

Supporting data from the Ministry of Environment and Forestry shows that companies with green and gold PROPER ratings managed to increase operational cost efficiency by up to 15% after adopting green accounting (KLHK, 2023). This efficiency not only helps companies reduce expenses but also attracts the attention of investors who increasingly value environmental commitment as a major factor in making investment decisions. This confirms that green accounting is not only a reporting tool but also a business strategy that adds economic and reputational value. This approach demonstrates that sustainability can be aligned with increased competitiveness, efficiency, and profitability, making green accounting a crucial component of the manufacturing sector's business strategy in responding to global competition.

Research on cement companies in Indonesia reveals that grouping environmental costs, including prevention, detection, and external failure costs, is a crucial strategy for managing the environmental impact of production activities (Yuliana and Abdullah, 2018). This approach offers a more systematic framework for recording and managing costs associated with environmental impacts, enabling companies to enhance operational efficiency and sustainability. A survey from the ASEAN Centre for Energy (ACE) (2022) supports these findings, stating that cement companies that adopted environmental costing recorded an increase in energy efficiency of up to 20%. These efficiencies not only help lower production costs but also support companies' efforts to fulfill their social responsibilities. With greater transparency, companies can strengthen public and stakeholder trust in their environmental commitments. This demonstrates that integrating environmental costs into the traditional accounting system yields dual benefits: cost savings and an improved sustainability image.

At the ASEAN level, the green accounting approach is increasingly relevant, especially for companies competing in awards such as the Asia Sustainability Reporting Awards. In sustainability reports, the carbon emissions dimension is shown to have a significant positive impact on the company's economic value, while poor management of water consumption can have a negative impact (Sukmadilaga et al., 2023). Data from the Asian Development Bank (2023) revealed that 70% of companies in ASEAN that implemented green accounting managed to increase Economic Value Added (EVA) by up to 15% by demonstrating a commitment to sustainability through transparent reporting.

The findings confirm that sustainability orientation provides a competitive advantage for firms in attracting investors, customers, and other stakeholders. Moreover, sustainability awards create additional incentives for companies to continue adopting green accounting as part of their strategy. By integrating transparent sustainability reporting, companies in the cement, heavy industry, and other sectors can demonstrate a strong commitment to sustainability while increasing their competitiveness in the global market.

CONCLUSION

This research emphasizes the significance of measuring and reporting environmental indicators within a green accounting framework, particularly for the medium-sized business sector. Energy resources, such as water and electricity, as well as waste management, are key components of environmental sustainability. Measuring the efficiency of their use helps companies improve their operations. The development of a simple and structured green accounting reporting model provides a solution to challenges such as management, resource, and regulatory limitations. With a transparent approach to environmental costs, including the prevention, detection, and management of failures, companies can identify efficiency opportunities and support long-term sustainability. The research also emphasizes that the implementation of green accounting can improve corporate profitability, strengthen relationships with stakeholders, and create a positive corporate image. However, challenges such as low awareness, limited financial resources, and weak regulatory support remain significant obstacles, particularly for SMEs in developing countries. The findings confirm that the adoption of green accounting can improve operational efficiency, economic value, transparency, and business competitiveness, especially in sustainability-conscious markets. For the government, it is necessary to strengthen regulations and incentives such as subsidies or tax breaks to encourage implementation, especially for SMEs. Additionally, educational institutions and training organizations play a crucial role in enhancing the awareness and technical understanding of business professionals through environmental accounting training programs. The customization of environmental reporting to local culture and conditions also increases the relevance and effectiveness of green accounting in various industry sectors.

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