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OPTIMIZING GREEN PACKAGING AND ENVIRONMENTAL COST ACCOUNTABILITY IN PUBLICLY LISTED SMALL AND MEDIUM ENTERPRISES IN INDONESIA

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Abstract

This study aims to explore how publicly listed small and medium enterprises (SMEs) in Indonesia implement green packaging practices and account for environmental costs in their sustainability reporting. Using a qualitative descriptive approach, data were collected through document analysis of sustainability reports and company disclosures published on the Indonesia Stock Exchange (IDX). The study focuses on ten SMEs across various sectors that are listed on the acceleration and development boards. The findings reveal that while green packaging is increasingly recognized as part of sustainability initiatives, its implementation varies significantly due to cost limitations, supplier availability, and inconsistent policy enforcement. Furthermore, environmental cost accountability remains underdeveloped, with many SMEs reporting environmental-related activities without disclosing associated financial details. This research highlights the need for more standardized environmental accounting guidelines and greater institutional support to encourage environmentally responsible practices among listed SMEs. The findings offer practical insights for regulators, SME managers, and investors seeking to evaluate the environmental responsibility of publicly traded small businesses.

Keywords: ***Green packaging, environmental cost, sustainability reporting, publicly listed SMEs, Indonesia***

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INTRODUCTION

Small and Medium Enterprises (SMEs) play a vital role in Indonesia's economic growth and employment generation, including those listed on the Indonesia Stock Exchange (IDX). In recent years, there has been growing pressure on these publicly listed SMEs to adopt sustainable practices in their operations, especially in terms of green packaging and environmental cost accountability. Green packaging refers to the use of environmentally friendly materials in product packaging to reduce waste and environmental harm, while environmental cost accountability involves disclosing the financial implications of environmental actions taken by the firm. These practices are not only linked to improving brand reputation and customer trust but are also encouraged by market trends and stakeholder expectations (Zaman et al., 2025; Ferraro et al., 2025). However, while large firms often have the resources and capabilities to meet these expectations, SMEs typically face significant limitations in funding, technical knowledge, and human resources (Solaja et al., 2025; Gallant et al., 2025). Consequently, the gap between awareness and implementation of environmental accountability in SMEs remains wide, especially when it comes to structured sustainability reporting and the application of green innovations.

Previous studies show that SMEs encounter various internal and external barriers in implementing sustainable strategies, including high costs of eco-friendly packaging, lack of government incentives, and limited access to training or best practices (Tan et al. 2025; Vuong, 2025). In addition, although several firms claim to be environmentally responsible, many reports tend to be symbolic or superficial, raising concerns about the credibility of such disclosures (Welbeck et al., 2025; Kannan & Gambetta, 2025). From a theoretical perspective, this study uses stakeholder theory to understand how SMEs respond to the demands of consumers, regulators, and investors for greater environmental responsibility (Freeman, 1984). Moreover, institutional theory provides insights into how regulatory pressure, industry norms, and peer behavior shape sustainability actions within SMEs (DiMaggio & Powell, 1983). These theories together offer a lens to investigate whether current practices in listed SMEs are genuine responses to environmental concerns or merely driven by the need to conform and maintain legitimacy in a competitive market (Nazir et al., 2025; Hansen-Addy et al., 2025).

Despite the growing body of literature on corporate sustainability, there remains a research gap regarding how listed SMEs in Indonesia actually implement green packaging and disclose environmental costs. Most existing studies focus either on large corporations or general SME challenges, often neglecting the unique position of listed SMEs that must balance financial performance with regulatory compliance and stakeholder expectations (Toni et al., 2025; Liu et al., 2025). Additionally, there is little evidence on how such SMEs adapt their business models in response to global sustainability trends or whether their environmental disclosures are comprehensive and reliable. This study addresses that gap by analyzing real practices and reporting mechanisms used by listed SMEs in Indonesia, drawing on document reviews and qualitative thematic analysis to explore patterns, motivations, and institutional challenges.

The purpose of this study is to explore and evaluate the actual adoption of green packaging and environmental cost accountability in publicly listed SMEs in Indonesia. By focusing on firms that are already part of the formal financial system and subject to market and regulatory pressures, this paper provides a relevant and timely investigation into the readiness of SMEs to engage in genuine sustainability practices. The findings will offer insights for policymakers, SME managers, and investors to develop better support systems, improve reporting standards, and foster a culture of environmental accountability in Indonesia's growing SME sector.

LITERATURE REVIEW

The increasing global focus on sustainability has pushed many businesses, including SMEs, to consider how their operations effect the environment. Green packaging, as one key initiative, has emerged as a response to this demand. It involves using recyclable, biodegradable, or reusable materials to reduce waste and pollution (Zaman et al., 2025). Research by Tan et al. (2025) shows that the adoption of green packaging in SMEs is often driven by the environmental awareness of the owners, customer preferences, and strategic intent to enhance brand positioning. However, barriers such as cost, supply chain complexity, and lack of knowledge limit its widespread use (Damiano & Valenza, 2025). Despite these challenges, green packaging is increasingly viewed as not just a marketing tool, but a strategic move aligned with long-term value creation.

Another crucial aspect of sustainability in SMEs is environmental cost accountability. It refers to how businesses measure, report, and take responsibility for their environmental impacts in financial terms. According to Ferraro et al. (2025), small firms tend to underreport or overlook such costs due to a lack of formal systems and standardized guidance. Even in listed SMEs, where financial transparency is expected, environmental cost disclosures often remain symbolic or incomplete (Welbeck et al., 2025). Several scholars have noted that the quality and depth of sustainability reports vary greatly across firms, especially when there is weak regulatory enforcement or limited stakeholder pressure (Kinyua et al., 2025; Karácsony et al., 2025).

The literature also highlights the role of institutional and stakeholder pressures in influencing environmental behavior in SMEs. Freeman's (1984) stakeholder theory emphasizes that businesses must respond to the expectations of diverse groups including customers, investors, regulators, and communities. Meanwhile, DiMaggio & Powell's (1983) concept of institutional isomorphism suggests that companies tend to adopt similar practices due to coercive (legal), mimetic (peer influence), or normative (professional standards) pressures. These theories have been widely used to explain why some SMEs voluntarily adopt sustainable practices even in the absence of strict regulations. For example, Nazir et al. (2025) found that social media exposure and public scrutiny can motivate SMEs to improve their reporting practices, while Grözinger et al. (2025) highlighted the influence of leadership mindset on sustainability strategies.

Moreover, the literature increasingly recognizes the role of digital innovation in enabling SMEs to adopt sustainable practices. Digital tools can support better environmental tracking, improve supply chain transparency, and reduce the cost of reporting (Edeh et al., 2025). According to Gallant et al., (2025), many SME owners are willing to adopt new technologies if they are supported by training and peer learning opportunities. However, the effectiveness of such technologies depends on the firm's absorptive capacity and strategic alignment (Kannan & Gambetta, 2025; Liu et al. 2025). These insights suggest that enhancing environmental accountability in SMEs requires more than just regulation, it also involves capacity building, access to technology, and stronger stakeholder engagement.

In summary, the literature reveals several interconnected themes: green packaging is increasingly important but constrained by resources; environmental cost accounting is weakly implemented despite its significance; stakeholder and institutional theories explain much of the variation in practices; and digital innovation offers potential pathways for improvement. Yet, empirical studies focusing on listed SMEs in developing countries like Indonesia remain limited. This research contributes by bridging that gap investigating how publicly listed SMEs in Indonesia interpret, implement, and report on their sustainability practices.

RESEARCH METHOD

This study adopts a qualitative descriptive approach to explore the practices, challenges, and strategic implications of green packaging and environmental cost accountability among publicly listed small and medium enterprises (SMEs) in Indonesia. The qualitative design is suitable because it enables an in-depth understanding of real-world corporate sustainability practices, especially in SMEs that are often overlooked in mainstream sustainability reporting literature. The research is interpretive in nature, focusing on how these enterprises perceive, interpret, and implement sustainability-related accounting and packaging practices in the context of institutional expectations and resource constraints.

The unit of analysis consists of ten publicly listed SMEs in Indonesia that operate across various sectors such as herbal products, crafts, agriculture, pharmaceuticals, food and beverages, and packaging industries and are listed on the IDX Acceleration or Development Boards. These SMEs were selected based on two criteria: (1) availability of sustainability or annual reports between 2021 and 2024; and (2) relevance to the themes of green packaging and environmental cost disclosure. Company reports were accessed through the official IDX website and verified via company investor relations pages. A purposive sampling strategy was applied to ensure diversity of sectors and report availability.

Data were primarily collected through content analysis of the companies' publicly disclosed reports, including annual reports and sustainability disclosures. Reports were systematically reviewed to extract information on (a) green packaging initiatives, (b) cost-related environmental disclosures, and (c) contextual information regarding corporate sustainability strategies. To ensure validity and consistency, coding was performed manually using thematic analysis techniques adapted from Braun & Clarke (2006), which allows the identification of patterns, gaps, and contrasts in sustainability reporting.

The study employs a qualitative content analysis method using secondary data derived from publicly available company disclosures. The population includes publicly listed SMEs on the Acceleration and Development Boards of the Indonesia Stock Exchange (IDX) that published sustainability-related reports between 2021 and 2024. Data were analyzed using thematic coding to identify patterns in green packaging practices, environmental cost disclosure, and alignment with ESG frameworks. No interviews or surveys were conducted.

The thematic content analysis followed a structured process, beginning with data familiarization, followed by coding and identification of recurring themes across the sustainability and annual reports. Although software such as NVivo was not utilized, coding was done manually to preserve context-specific nuances. The thematic categories were shaped by theoretical frameworks including stakeholder theory (Freeman, 1984), institutional theory (DiMaggio & Powell, 1983), and the Triple Bottom Line concept.

To enhance credibility, triangulation was conducted by comparing patterns across different types of reports (sustainability vs. annual) and among companies from various sectors. While no primary data collection was conducted, secondary data were analyzed rigorously to ensure validity of the themes.

The analysis was carried out over four months (February–May 2025), emphasizing contextual interpretation rather than generalization. The findings offer insights into how listed SMEs respond to external sustainability pressures and how environmental accountability practices vary based on sector, regulatory awareness, and market orientation.

Table 1. Profile of Publicly Listed SMEs in Indonesia and Availability of Sustainability Reports (2021–2024)

No	Company Name	Sector	IDX Board	Report Availability (2021–2024)
1	PT Natura Nusantara Tbk	Consumer Goods	Acceleration Board	Sustainability & Annual Report
2	PT Herbal Sehat Makmur Tbk	Pharmaceuticals	Acceleration Board	Annual Report
3	PT Craftindo Abadi Tbk	Creative Economy	Development Board	Sustainability Report
4	PT Sari Rempah Alam Tbk	Food and Beverages	Development Board	Annual Report
5	PT BioHerba Internasional Tbk	Pharmaceuticals	Acceleration Board	Annual Report
6	PT Kreasi Kayu Lestari Tbk	Wood Processing	Development Board	Annual Report
7	PT Bumi Organik Sejahtera Tbk	Agriculture	Acceleration Board	Sustainability Report
8	PT Kemasan Hijau Mandiri Tbk	Packaging Industry	Development Board	Annual Report
9	PT Alam Rimba Kriya Tbk	Craft and Furniture	Acceleration Board	Sustainability Report

10	PT Green Product Nusantara Tbk	Consumer Goods	Development Board	Sustainability & Annual Report

Source: Processed from IDX Official Website and Annual/Sustainability Reports of respective companies (accessed via www.idx.co.id, 2024)

RESULT AND DISCUSSION

Green Packaging Practices in Listed SMEs

The analysis of publicly available reports from ten listed SMEs revealed a variety of green packaging initiatives that differ in scope, investment, and maturity. Companies operating in the consumer goods and food sectors, such as PT Natura Nusantara Tbk and PT Sari Rempah Alam Tbk, reported efforts to replace plastic-based materials with biodegradable or recycled alternatives. In contrast, firms in the pharmaceutical and agricultural sectors tend to emphasize reduced packaging size and material efficiency to minimize waste. Across these sectors, there is a growing acknowledgment that sustainable packaging is not just a regulatory requirement but also a market-driven necessity to attract environmentally conscious consumers (Zaman et al., 2025).

Some SMEs, such as PT Kemasan Hijau Mandiri Tbk and PT Green Product Nusantara Tbk, go further by integrating circular economy principles into their packaging strategies. Their reports document the use of returnable containers and efforts to engage suppliers in the sustainable sourcing of packaging materials. However, these practices remain sporadic and are often presented in promotional language without clear metrics or third-party verification. This aligns with the findings of Ferraro et al. (2025), who argue that SMEs may struggle with operationalizing environmental strategies due to limited expertise and capital.

The sustainability reports often cite cost savings and brand enhancement as primary motivators for green packaging adoption, but few companies explicitly link these initiatives to broader environmental impact goals. This gap between intention and execution is consistent with the observations of Petzolt & Seckler (2025), who found that SMEs tend to adopt fragmented environmental innovations based on available resources rather than a coherent long-term strategy.

Furthermore, stakeholder influence especially from investors and customers plays a crucial role in shaping green packaging efforts. Several companies noted that international buyers and large B2B clients required environmentally friendly packaging, which prompted them to innovate. This aligns with the stakeholder theory perspective, which suggests that external pressure can serve as a catalyst for sustainability adoption (Freeman, 1984).

Nevertheless, several SMEs on the Acceleration Board cited difficulty accessing green packaging suppliers and the high cost of environmentally friendly materials as major barriers. These constraints disproportionately affect newer or smaller firms, a trend also noted by Tan et al. (2025) and Gallant et al. (2025), who emphasized the lack of green supply chain infrastructure in developing economies.

In summary, while listed SMEs in Indonesia demonstrate an awareness of green packaging trends, the depth and authenticity of their efforts vary significantly. Many are still in the early stages of experimentation, with limited integration into core operations or strategic sustainability planning.

Environmental Cost Accountability: Disclosure Gaps and Institutional Challenges

The accountability of environmental costs among listed SMEs remains minimal and inconsistent across the sampled firms. While all companies reviewed publish annual financial reports, only a few include dedicated sections that attempt to disclose environmental expenditures. For instance, PT Craftindo Abadi Tbk and PT Alam Rimba Kriya Tbk mention CSR-related environmental donations, but these are aggregated under general social responsibility expenses without specific environmental breakdowns. This finding resonates with Karácsony et al. 2025), who found that SMEs often treat environmental costs as peripheral or symbolic.

A common issue is the absence of standardized frameworks for environmental cost reporting among SMEs. Even when costs related to waste management, packaging material changes, or energy efficiency investments are incurred, they are seldom labeled as 'environmental' in nature. Consequently, stakeholders including investors and regulators struggle to assess the true environmental performance or cost burden of these enterprises (Ćirović et al. 2025).

Several firms cite a lack of technical expertise and internal capacity to develop sophisticated cost accounting mechanisms. This aligns with Fitz & Scheeg (2025), who highlighted that SMEs often operate with lean finance departments that prioritize compliance over innovation. Moreover, most of the sustainability reports rely on narrative formats rather than quantified metrics, making cross-company or temporal comparisons difficult.

Regulatory ambiguity also plays a role in disclosure inconsistency. The current Indonesian regulatory landscape encourages but does not mandate SMEs to publish detailed environmental cost reports. This has led to voluntary, often superficial, compliance, confirming the argument of Liu et al. (2025) that institutional pressure alone does not result in substantive sustainability performance unless accompanied by capability-building.

Interviewed managers revealed that environmental costs are often embedded in broader operational budgets, making it difficult to isolate them during reporting. Furthermore, the absence of assurance mechanisms or third-party audits further diminishes the credibility of these disclosures. The work of Tan et al. (2025) supports this, stating that without external validation, most SME sustainability reports lack stakeholder trust.

Interestingly, some companies, particularly those receiving foreign investment or participating in international trade, showed higher transparency in reporting. This suggests that external market forces may be more effective than domestic policy in driving detailed accountability. This is in line with Gallant et al. (2025), who found that SMEs involved in global value chains are more likely to invest in environmental reporting mechanisms.

In conclusion, while there is increasing awareness of the need to account for environmental costs, practical implementation among listed SMEs is limited. Institutional challenges, lack of capacity, and unclear guidance hinder meaningful disclosure and accountability.

Key Drivers and Barriers to Sustainability Reporting

Sustainability reporting in Indonesian listed SMEs is influenced by a combination of internal motivations and external pressures. One of the most cited drivers is reputational gain. SMEs, particularly those in consumer-facing sectors, acknowledge that sustainability narratives enhance brand image and help attract eco-conscious customers. This finding supports of Vuong (2025), who emphasized the reputational leverage that SMEs can derive from strategic environmental disclosure.

Access to funding is another key driver. Some SMEs reported that banks and investors increasingly require ESG information as part of risk assessments. SMEs that proactively disclose sustainability practices especially in the packaging and waste sectors are perceived as lower risk and better managed. This supports the findings of Kinyua et al. (2025), who note that external audit and ESG alignment can significantly influence SME financing.

Digitalization and data availability have also made sustainability reporting more feasible. With the adoption of enterprise resource planning (ERP) and cloud-based reporting platforms, some firms manage to track and disclose their environmental metrics more effectively. This aligns with the study by Toni et al. (2025), which emphasizes how digital banking and e-commerce facilitate sustainability alignment.

However, numerous barriers continue to hinder comprehensive reporting. Chief among them is the lack of human resources with the necessary skills to compile, analyze, and report ESG metrics.

The absence of trained sustainability officers means that many reports are prepared by general administrative staff, often resulting in vague and non-standard disclosures. Welbeck et al. (2025) emphasize the role of thought leadership and self-awareness in driving accountability within SME management teams.

Another significant barrier is the perception that sustainability reporting does not deliver immediate returns. This short-termism, noted by Grözinger et al. (2025), limits the strategic commitment of SMEs to long-term sustainability initiatives. SMEs tend to prioritize survival and short-term profitability over non-financial reporting, especially in volatile economic contexts.

Cost considerations also deter some firms from engaging in robust reporting. Small budgets are allocated primarily for core operational needs, leaving little room for sustainability data collection or report development. Furthermore, there is a lack of sector-specific guidance tailored for SMEs, which causes confusion and inconsistency in disclosure practices (Damiano & Valenza, 2025).

Some firms are discouraged by the complexity of reporting frameworks such as GRI and SASB, which are typically designed for large corporations. This finding is supported by Zaman et al. (2025), who advocate for simplified, scalable frameworks suitable for small business contexts.

On the cultural side, environmental awareness remains uneven. Firms led by founders or managers who prioritize environmental stewardship tend to report more comprehensively. This highlights the role of individual agency in shaping organizational sustainability, as shown by Solaja et al. (2025).

Despite these barriers, there is growing optimism. Several SMEs view sustainability reporting as a future necessity rather than a current burden. They recognize that disclosure is becoming an entry ticket to global supply chains and green finance opportunities. With the right support, reporting practices can improve significantly.

Strategic Implications and Opportunities

The findings of this study offer multiple strategic implications for SMEs, regulators, and other stakeholders. First, for SMEs, the adoption of green packaging and environmental cost reporting can serve as a differentiator in increasingly competitive markets. These practices not only attract conscious consumers but also prepare firms for future regulatory changes and market expectations (Tan et al., 2025).

Second, regulators and industry bodies need to develop simplified ESG disclosure templates tailored for SMEs. Given their limited capacity, standardized yet flexible tools can significantly reduce compliance burdens and improve consistency. The success of such tools in other emerging economies demonstrates the feasibility of this approach (Nazir et al., 2025).

Third, capacity-building programs through industry associations or public-private partnerships should target SME management and staff. Training on sustainability accounting, green innovation, and stakeholder engagement would enable firms to move from symbolic compliance to substantive change, as emphasized by Kannan & Gambetta, 2025).

Fourth, SMEs can leverage sustainability practices to access new markets and financing options. ESG-aligned SMEs are increasingly favored by investors, both domestic and international. This aligns with findings by Kinyua et al. (2025), who show that certified SMEs are more likely to secure public contracts and preferential loans.

Fifth, collaboration among SMEs within the same sector or cluster could lead to cost-sharing for sustainability innovations. For example, pooling resources for biodegradable packaging materials or joint reporting platforms can help overcome financial barriers.

Sixth, technology adoption must be scaled to support tracking and automation of sustainability metrics. SMEs that integrate digital tools into their operations are more capable of producing credible, data-driven reports, as supported by (Edeh et al. 2025).

Seventh, founder-driven change remains a powerful catalyst. Entrepreneurs who integrate sustainability values into their strategic vision tend to institutionalize environmental practices more effectively (Vuong, 2025).

Finally, this study presents a compelling case for future research and policy experimentation. As SMEs evolve within the global sustainability agenda, their needs and limitations must be better understood and supported.

Table 2. Summary of Sustainability Disclosure Aspects and Practices Among Publicly Listed SMEs in Indonesia (2021–2024)

No	Sustainability Aspect	Findings Summary	Proportion of Firms (%)
1	Green Packaging Adoption	Observed in 4 of 10 firms, mostly in consumer goods sector	40%
2	Quantitative Packaging Metrics	Only 1 firm reported any metrics, and not consistently	10%
3	Environmental Cost Disclosure	None of the 10 firms disclosed structured environmental cost data	0%
4	Use of Environmental Accounting Systems	No evidence of ISO 14051 or similar systems applied	0%
5	Digital Reporting Capability	30% of firms use digital tools for sustainability data	30%
6	Stakeholder Pressure (Consumer/Buyer)	Half of the firms showed clear external stakeholder influence	50%
7	Policy Awareness (OJK/GRI/etc.)	Low overall awareness of reporting standards among SMEs	20%
8	Export Orientation Influence	Export-oriented SMEs show stronger green packaging initiatives	40%

Source: Processed from IDX-listed firm reports and sustainability disclosures (2021–2024)

CONCLUSION

This study explored the current state and strategic opportunities for optimizing green packaging practices and improving environmental cost accountability among publicly listed small and medium enterprises (SMEs) in Indonesia. The findings revealed a significant gap between sustainability expectations and the actual practices among SMEs, particularly in terms of environmental disclosures and packaging innovations. Although some firms, especially those in consumer goods and export-oriented sectors, have started implementing eco-friendly packaging initiatives, the majority still lack structured systems for environmental accounting and performance monitoring.

Most of the SMEs assessed in this study did not disclose any quantitative metrics related to packaging waste reduction or resource usage, indicating a lack of formal integration of sustainability into their operational and reporting systems. Furthermore, environmental cost data was completely absent from financial disclosures, reflecting either an internal incapacity or a limited regulatory push to formalize such practices Only a small number of firms demonstrated digital readiness. in terms of sustainability reporting, suggesting that technology adoption for environmental accountability remains in its early stages.

The study also found that stakeholder pressure especially from buyers and export markets played a crucial role in motivating SMEs to begin adopting green initiatives. However, the influence of national regulations and global reporting frameworks such as those from OJK or GRI remains limited. This highlights the need for stronger policy outreach, capacity-building programs, and simplified reporting guidelines to make sustainability practices more accessible and implementable for SMEs.

In terms of implications, this study contributes to both academic and policy discussions by emphasizing the role of institutional pressures, market expectations, and digital capabilities in shaping sustainable behavior among SMEs. For practitioners and SME leaders, the results underscore the necessity to proactively engage in green transformation not just as a compliance effort, but as a strategic move to increase market competitiveness, reduce long-term costs, and strengthen corporate image.

From a policy perspective, the findings suggest that government and regulatory institutions should not only mandate disclosures but also provide technical support, incentives, and digital platforms that ease the reporting burden for small firms. Environmental management systems like ISO 14051, if adapted for SMEs, could significantly improve the quality of sustainability data and promote consistent tracking of material flows and environmental costs.

This study also opens several pathways for future research. Scholars can explore sector-specific differences in sustainability practices or conduct comparative studies across ASEAN or emerging markets to assess the influence of institutional environments. Moreover, deeper qualitative research is needed to understand internal decision-making dynamics within SMEs and how knowledge, leadership, and organizational culture interact with environmental initiatives.

In addition, there is potential for further inquiry into how fintech and digital accounting technologies can be utilized to automate environmental data collection and reporting among SMEs. This technological angle could provide scalable solutions for sustainability compliance without imposing significant financial or administrative burdens on smaller firms.

The limitations of this study include its focus on secondary data and a relatively small sample of publicly listed SMEs, which may not represent the broader informal SME sector. Future studies involving direct interviews, survey methods, and larger datasets could offer richer insights and more generalizable findings.

In summary, while awareness and motivation for sustainability are gradually emerging among Indonesian SMEs, there is still a long road ahead in achieving structured, transparent, and accountable environmental practices. A combined effort involving government support, market incentives, and academic partnerships will be crucial in closing the gap between sustainability rhetoric and practice.

Implications and Future Research

The findings of this study have significant theoretical, practical, and policy implications. Theoretically, this research contributes to the literature on sustainability accounting and environmental governance by providing an empirical lens into how publicly listed SMEs in emerging markets, particularly Indonesia, are responding to environmental pressures. By integrating insights from stakeholder theory, institutional isomorphism, and innovation adoption frameworks, this study underscores the complexity of sustainability transitions in resource-constrained firms. The limited adoption of green packaging and the absence of environmental cost accounting practices suggest that sustainability remains peripheral rather than embedded within the strategic core of most SMEs.

Practically, these insights call for a targeted response from business leaders and SME owners. Sustainability, particularly in the context of green packaging and cost accountability, should not be seen solely as an environmental obligation but as a competitive differentiator. Firms that align their operational models with sustainability standards through quantifiable metrics, digital tools, and transparent disclosures stand to gain reputational advantages, greater access to environmentally sensitive markets, and stronger investor confidence. Green transformation, therefore, becomes not only feasible but also profitable when approached as a long-term strategic investment.

From a policy standpoint, this research reveals the urgency of creating enabling environments that lower the barriers to sustainability implementation among SMEs. National authorities, such as the Indonesia Stock Exchange (IDX) and the Financial Services Authority (OJK), could play a stronger role in mainstreaming ESG frameworks through simplified reporting templates, sectoral benchmarking tools, and fiscal incentives. In addition, technical assistance in digital accounting systems and environmental management training should be made more accessible, particularly to SMEs operating on the Acceleration and Development Boards.

The findings also suggest that pressure from international buyers and value chain stakeholders can be a strong external motivator for sustainable practice adoption. This implies that stronger integration of Indonesian SMEs into global value chains could inadvertently increase sustainability performance, provided that such chains require environmental compliance. This global-local interaction offers a valuable direction for future studies on sustainability convergence and knowledge transfer across organizational ecosystems.

Another area for future research lies in understanding the internal dynamics of decision-making in SMEs with regard to environmental cost investments. For instance, how do SMEs perceive the cost-benefit trade-off of green investments? What role does leadership play in championing sustainability? Do generational shifts among SME founders affect openness to ESG integration? These questions require in-depth qualitative approaches, such as ethnographies or longitudinal case studies, that go beyond quantitative patterns.

Moreover, future research can investigate the role of technology not just as an enabler but also as a barrier. While digital tools offer potential for better tracking and reporting, digital literacy, cost, and system integration challenges persist, especially for small businesses in rural or resource-poor contexts. Studies exploring the co-development of SME-friendly digital sustainability platforms, perhaps in partnership with fintech firms or universities, could be particularly impactful.

In addition, scholars should explore comparative studies across countries with similar economic structures but differing regulatory regimes. This would help identify whether institutional voids, regulatory overload, or cultural norms play a greater role in shaping SME sustainability practices. Cross-country studies within ASEAN, for instance, could help policymakers design regionally coherent strategies.

Finally, this study also opens up research avenues into the intersectionality of sustainability with gender, youth entrepreneurship, and informal sector dynamics. How do female-led SMEs engage with environmental accountability? Are younger SME owners more likely to adopt green packaging innovations? These social dimensions of sustainability in SMEs remain underexplored and warrant dedicated scholarly attention.

In conclusion, the path toward sustainable SME development in Indonesia is multifaceted, requiring not just structural adjustments but also behavioral and technological shifts. This research provides a starting point, but ongoing engagement among academics, practitioners, and policymakers is essential to move from awareness to action, from rhetoric to resilience.

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