Jurnal Visi Manajemen
Volume. 12, Nomor. 1 Januari 2026
E-ISSN: 2528-2212; P-ISSN: 2303-3339, Hal 50-65
DOI: https://doi.org/10.56910/jvm.v12i1.916
Tersedia: https://stiepari.org/index.php/jvm

The Impact of Green Accounting Practices on Corporate Environmental Performance

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Abstract*. This study investigates the impact of green accounting practices on corporate environmental performance, with a focus on manufacturing firms in Indonesia. Green accounting, which involves the identification, measurement, and reporting of environmental costs, is increasingly recognized as a strategic tool for enhancing corporate accountability and sustainability. However, in developing countries, its implementation remains limited and fragmented. Using a qualitative approach, this research explores how green accounting mechanisms are integrated into corporate decision-making processes and how they influence key environmental performance indicators such as energy efficiency and waste reduction. Data were collected through semi structured interviews with environmental and finance managers from five companies actively participating in the PROPER environmental rating program. Thematic analysis revealed that firms with advanced environmental accounting practices achieved higher energy savings and waste reduction outcomes, as well as superior PROPER ratings. These improvements are directly linked to the strategic use of environmental data in operational planning and investment decisions. Nonetheless, challenges such as the lack of technical guidelines, insufficient human resources, and the absence of standardized frameworks remain significant barriers to broader adoption. The study contributes to the growing literature on sustainability accounting in emerging economies and offers practical implications for policymakers and corporate practitioners seeking to institutionalize green accounting as part of sustainable business governance.*

Keywords*: Energy Efficiency; Environmental Performance;Green Accounting; PROPER;Sustainability Reporting*

Abstrak. Penelitian ini mengkaji dampak penerapan praktik green accounting terhadap kinerja lingkungan perusahaan, dengan fokus pada perusahaan manufaktur di Indonesia. Green accounting, yang mencakup proses identifikasi, pengukuran, dan pelaporan biaya lingkungan, semakin diakui sebagai alat strategis untuk meningkatkan akuntabilitas dan keberlanjutan korporasi. Namun, implementasinya di negara berkembang masih terbatas dan bersifat fragmentaris. Penelitian ini menggunakan pendekatan kualitatif untuk mengeksplorasi bagaimana mekanisme akuntansi lingkungan diintegrasikan ke dalam proses pengambilan keputusan perusahaan serta pengaruhnya terhadap indikator kinerja lingkungan, seperti efisiensi energi dan pengurangan limbah. Data dikumpulkan melalui wawancara semi terstruktur dengan manajer lingkungan dan keuangan dari lima perusahaan yang aktif mengikuti program penilaian lingkungan PROPER. Hasil analisis tematik menunjukkan bahwa perusahaan dengan praktik green accounting tingkat lanjut mencatat peningkatan efisiensi energi dan pengurangan limbah yang lebih signifikan, serta memperoleh peringkat PROPER yang lebih tinggi. Peningkatan ini berkaitan langsung dengan penggunaan data lingkungan secara strategis dalam perencanaan operasional dan keputusan investasi. Namun demikian, tantangan seperti ketiadaan pedoman teknis, keterbatasan sumber daya manusia, dan belum adanya kerangka kerja yang terstandarisasi masih menjadi hambatan utama dalam perluasan adopsi. Studi ini memberikan kontribusi terhadap literatur akuntansi keberlanjutan di negara berkembang dan menawarkan implikasi praktis bagi pembuat kebijakan dan pelaku usaha dalam menginstitusionalisasikan green accounting sebagai bagian dari tata kelola bisnis berkelanjutan.

Kata kunci: Akuntansi Hijau; Efisiensi Energi; Kinerja Lingkungan; Pelaporan Keberlanjutan; PROPER

Naskah: 17 Oktober 2025; Revisi: 31 Oktober 2025; Diterima: 24 November 2025; Tersedia: 26 November 2025

1. INTRODUCTION

Environmental degradation and climate change have become global challenges that require serious responses from all sectors, including business entities. The increasing awareness of environmental sustainability has encouraged corporations to transform their operational and reporting systems to become more environmentally responsible. One approach that has gained significant attention in recent years is green accounting, which integrates environmental considerations into traditional accounting practices. This concept emphasizes that corporate performance should not only be measured in financial terms but also through its contribution to environmental preservation and sustainable resource use.

The traditional accounting system tends to ignore externalities, such as pollution, waste generation, or depletion of natural resources, which result from industrial activities. As a consequence, companies may appear financially successful while generating considerable environmental damage. Green accounting attempts to correct this distortion by internalizing environmental costs into accounting records, thus providing a more holistic view of a company's performance. According to the United Nations Division for Sustainable Development (UN, 2023), environmental accounting contributes to sustainable decision-making by quantifying the environmental costs and benefits of corporate activities. Therefore, it helps managers and stakeholders evaluate how operational efficiency aligns with ecological responsibility.

Empirical studies have shown that green accounting can serve as an essential tool for improving corporate environmental performance (Hassan et al., 2022; Rahman & Alam, 2023). By identifying, measuring, and reporting environmental costs, companies are able to control their resource consumption, reduce emissions, and implement cleaner production systems. Furthermore, the disclosure of environmental information increases transparency and builds corporate legitimacy among stakeholders. In an era where Environmental, Social, and Governance (ESG) criteria are increasingly used by investors and regulators, green accounting has become a strategic instrument that links sustainability with competitiveness.

However, despite its recognized importance, the implementation of green accounting remains limited, particularly in developing countries such as Indonesia. Several studies indicate that many companies have not yet fully integrated environmental aspects into their financial reporting systems due to lack of awareness, inadequate regulations, or limited technical capacity (Yuliana & Sari, 2021). This condition hinders the ability of organizations to assess their environmental impacts accurately and to design effective sustainability strategies.

Moreover, the absence of standardization and guidance in environmental accounting practices has led to inconsistencies in reporting, reducing comparability among firms and sectors.

Corporate environmental performance, on the other hand, reflects how effectively an organization manages the environmental consequences of its operations. It includes indicators such as waste reduction, energy efficiency, carbon emission control, and environmental management system implementation (OECD, 2022). The relationship between green accounting and environmental performance is thus strategic: accounting practices provide the data and framework that support sustainable operational behavior. When environmental costs are measured and disclosed, managers are better equipped to make informed decisions that improve environmental performance and comply with sustainability regulations.

In the Indonesian context, the government has launched several policies encouraging sustainable business practices, such as the Green Industry Standard (SIH), PROPER environmental rating program, and the adoption of ESG based reporting. Nevertheless, the integration of green accounting into corporate governance is still at an early stage. Few empirical studies have examined how green accounting practices influence corporate environmental performance in Indonesia's industrial sector. Given that Indonesia's economic growth heavily depends on resource-intensive industries, this gap presents an urgent research opportunity to explore how green accounting can serve as a driver for corporate environmental accountability and sustainability.

Based on the background above, this study aims to examine the impact of green accounting practices on corporate environmental performance. Specifically, it investigates how environmental accounting mechanisms such as identification, measurement, and reporting of environmental costs affect a firm's ability to achieve better environmental outcomes. The study also seeks to contribute to the growing literature on sustainability accounting by providing empirical evidence from an emerging economy perspective. By analyzing the relationship between green accounting and environmental performance, the research is expected to offer insights for policymakers, practitioners, and academics on how accounting innovations can foster environmental stewardship and sustainable competitiveness.

While the concept of green accounting has garnered increasing global attention as a strategic tool for sustainable business practices, its application in developing countries remains underexplored and insufficiently institutionalized. Numerous studies (e.g., Hassan et al., 2022; Rahman & Alam, 2023) have examined how environmental accounting contributes to enhanced transparency and environmental performance. However, the majority of these studies have been conducted in developed countries with well-established regulatory frameworks and

mature sustainability reporting standards. In contrast, empirical research focusing on the implementation and impact of green accounting in emerging economies, such as Indonesia, remains limited (Yuliana & Sari, 2021; Sari et al., 2022). Moreover, existing literature predominantly addresses environmental disclosure practices rather than the operational integration of green accounting into corporate financial and managerial systems (Nurhayati et al., 2023). As such, it remains unclear how companies in developing contexts utilize environmental accounting mechanisms such as the identification, measurement, and internal reporting of environmental costs to enhance environmental performance.

Another significant gap lies in the lack of standardized frameworks and technical guidelines for implementing green accounting across industries. Several studies have indicated that companies often adopt environmental accounting in a fragmented or symbolic manner, failing to link it meaningfully to performance outcomes (Wijayanti & Prasetyo, 2020; Ahmad et al., 2021). In the Indonesian context, various structural and institutional barriers including limited managerial awareness, insufficient technical expertise, and weak regulatory enforcement have constrained the broader adoption of green accounting (Kusuma & Hidayah, 2022; Nugroho et al., 2024). These limitations hinder firms' ability to accurately assess environmental impacts, develop effective sustainability strategies, and report meaningful environmental performance metrics. Despite the Indonesian government's efforts to encourage sustainable industry practices through policies such as the PROPER environmental rating system and ESG based disclosure initiatives, empirical studies examining the direct relationship between green accounting practices and environmental performance remain scarce. Thus, there is a pressing need for context specific, empirical research that investigates how environmental accounting contributes to improved environmental outcomes, particularly in resource intensive sectors that dominate Indonesia's industrial landscape.

The novelty of this study lies in its empirical investigation of the relationship between green accounting practices and corporate environmental performance in the Indonesian context a relatively under researched area in the current literature. Unlike prior studies that primarily focus on environmental disclosure or conceptual discussions, this research emphasizes the operational integration of green accounting mechanisms (i.e., cost identification, measurement, and reporting) into corporate decision-making processes and examines their measurable impact on environmental performance indicators, such as energy efficiency, waste reduction, and emissions control. Furthermore, the study offers contextual insights from a developing country, providing practical implications for policy makers and corporate practitioners seeking to advance sustainability through accounting innovations in emerging markets.

2. THEORETICAL STUDY

Green accounting as a concept has evolved from the broader movement toward sustainability accounting, aiming to bridge the gap between economic growth and environmental responsibility. This theoretical study elaborates on the fundamental concepts, theoretical frameworks, and previous empirical evidence supporting the relationship between green accounting and corporate environmental performance. Understanding these theoretical foundations is essential for explaining how environmental accounting practices influence organizational behavior, decision-making, and performance outcomes within the sustainability paradigm.

Concept of Green Accounting

Green accounting, also known as environmental accounting, refers to the process of identifying, measuring, and reporting environmental costs and benefits associated with business activities. It integrates environmental data into conventional accounting systems, providing a comprehensive view of a company's overall performance beyond financial indicators (Gray et al., 2019). The objective is to internalize external environmental impacts such as pollution, resource depletion, and waste into financial decision making.

According to the United Nations System of Environmental Economic Accounting (SEEA, 2022), green accounting allows firms to assess the economic value of natural resources and to evaluate the environmental consequences of production. This approach supports sustainable decision making by combining ecological data with economic indicators. In practice, green accounting encompasses two key branches: Environmental Financial Accounting (EFA), which focuses on external reporting, and Environmental Management Accounting (EMA), which focuses on internal decision making and control (Schaltegger et al., 2020). Together, these tools enable managers to align business strategy with sustainability goals.

Corporate Environmental Performance

Corporate Environmental Performance (CEP) represents the measurable outcomes of a firm's environmental management efforts. It reflects the extent to which an organization reduces environmental harm through its operations, products, and processes. Key dimensions of CEP include waste minimization, energy efficiency, carbon emission reduction, and compliance with environmental regulations (OECD, 2021). Bansal and Song (2023) argue that CEP is both an operational and reputational construct: operationally, it reflects the tangible

results of environmental actions, while reputationally, it demonstrates the firm's legitimacy in the eyes of stakeholders. Firms that achieve high environmental performance often experience benefits such as cost savings, improved brand image, and enhanced investor trust. Therefore, measuring CEP through accurate accounting systems becomes a strategic necessity for sustainable competitiveness.

Relationship between Green Accounting and Environmental Performance

Theoretically, green accounting contributes to improved environmental performance through three primary mechanisms. First, it enhances information transparency, allowing managers to identify inefficiencies in resource use and waste management (Bebbington & Unerman, 2020). Second, it strengthens environmental decision-making, as accounting data help firms prioritize investments in clean technologies and sustainable materials. Third, it promotes organizational accountability, ensuring that companies internalize environmental externalities in their financial reporting and risk assessments. Empirical studies have shown a positive and significant relationship between green accounting implementation and environmental performance. For instance, Hassan et al. (2022) demonstrated that green accounting practices increase corporate efficiency in managing waste and emissions, leading to better environmental outcomes. Similarly, Rahman and Alam (2023) found that environmental management accounting mediates the relationship between corporate strategy and sustainability performance. These findings reinforce the view that environmental accounting serves as both a measurement tool and a behavioral driver toward sustainability.

Empirical Review of Prior Studies

The relationship between green accounting and corporate environmental performance can be explained through several foundational theories in accounting and organizational behavior. Legitimacy Theory posits that organizations operate within a social contract, where they must align their actions with societal values and expectations to maintain legitimacy. Through green accounting, firms demonstrate accountability and transparency in managing environmental impacts, thereby securing societal approval and reducing legitimacy gaps. Stakeholder Theory, introduced emphasizes that companies are responsible not only to shareholders but also to a broad range of stakeholders including customers, employees, regulators, and communities who influence and are affected by corporate actions. By adopting green accounting, companies provide relevant environmental information that meets stakeholder demands for sustainability and ethical operations. Institutional Theory further

supports this relationship by suggesting that organizational practices, including environmental accounting, are shaped by external institutional pressures such as government regulations, industry standards, and social norms. Firms adopt green accounting as a response to coercive pressures from legal requirements, mimetic pressures to emulate industry leaders, and normative pressures from professional associations that advocate sustainable practices. Meanwhile, the Triple Bottom Line (TBL) Theory developed by Elkington offers a holistic performance perspective, integrating three dimensions People, Planet, and Profit. Within this framework, green accounting serves as a mechanism to measure and balance environmental stewardship ("Planet") with economic outcomes ("Profit") and social well being ("People").

Empirical Review of Prior Studies

Empirical research has provided consistent evidence supporting the positive impact of green accounting on environmental performance. For example, a study by Djalil and Setiawan (2021) on manufacturing firms in Indonesia found that environmental cost accounting significantly improved resource efficiency and pollution control. Similarly, Sari et al. (2022) reported that environmental disclosure and management accounting practices positively affected firms' compliance with environmental regulations. Internationally, studies by Rahman and Alam (2023) and Hassan et al. (2022) demonstrated that environmental management accounting plays a mediating role between green accounting and environmental outcomes, particularly through energy efficiency initiatives. Meanwhile, Bansal and Song (2023) highlighted that companies integrating green accounting frameworks tend to achieve superior ESG (Environmental, Social, Governance) ratings. Despite these positive trends, challenges such as lack of standardization, data limitations, and implementation costs still hinder the full adoption of green accounting, especially in emerging economies.

3. RESEARCH METHODS

This study employs an exploratory qualitative approach to gain an in depth understanding of how green accounting practices are integrated into corporate decision making processes and their implications for environmental performance. This approach is appropriate as it allows the researcher to explore the context, motivations, and internal dynamics of firms implementing environmental accounting, particularly in developing countries like Indonesia, where regulatory and managerial awareness challenges persist (Rahman & Alam, 2023; Yuliana & Sari, 2021). The research method involves semistructured in depth interviews with key informants, such as environmental managers, heads of finance departments, and internal

auditors from manufacturing firms that participate in the PROPER program or practice ESG-based reporting. Informants are selected using purposive sampling based on specific criteria namely, companies actively engaged in sustainability reporting and having a dedicated unit for environmental management (Kusuma & Hidayah, 2022). A total of 5–10 informants is targeted, in line with the concept of data saturation in qualitative research (Saunders et al., 2018).

Data collection is complemented by document analysis of internal company records, sustainability reports, and PROPER evaluations as source triangulation to enhance data validity (Creswell & Poth, 2018). Data analysis is conducted using thematic analysis, following the stages of open coding, axial coding, and selective coding to identify emerging themes related to the integration of green accounting into managerial and reporting systems (Braun & Clarke, 2021).The appropriateness of the qualitative approach is supported by the limitations of quantitative studies in capturing the institutional and contextual dimensions of green accounting implementation, especially in emerging economies (Hassan et al., 2022). Therefore, this methodology contributes to bridging the literature gap on how environmental accounting practices are operationalized and interpreted in real world settings.

4. RESULTS AND DISCUSSION

The findings of this study reveal that green accounting practices have been gradually integrated into corporate managerial and reporting systems, albeit with implementation challenges. Based on in depth interviews with five informants from manufacturing firms participating in the PROPER program and practicing ESG based reporting, it was found that companies have begun identifying and measuring environmental costs such as waste management, carbon emissions, and energy efficiency as part of their internal reporting. This initiative not only enhances environmental transparency but also drives operational efficiency. For example, one company reported a 12% reduction in energy consumption over two years following the adoption of activity based environmental accounting. Document analysis, including sustainability reports and PROPER evaluations, further confirms that companies actively practicing green accounting tend to achieve higher PROPER ratings, indicating better environmental performance. These findings support the argument that measuring and reporting environmental costs function as effective internal control mechanisms that encourage environmentally responsible behavior at the operational level.

In the discussion, these findings reinforce existing literature which posits that green accounting positively contributes to corporate environmental performance (Hassan et al., 2022; Rahman & Alam, 2023). Such practices enable firms to identify inefficiencies in resource

utilization and take data driven corrective actions, such as investing in cleaner technologies or developing waste recycling systems. This aligns with Stakeholder Theory and the Triple Bottom Line (TBL) framework, which emphasize that firms use environmental accounting data to fulfill public expectations and enhance social legitimacy (Bebbington & Unerman, 2020). However, this study also highlights several implementation limitations, particularly the lack of technical standards and human resource capacity in environmental accounting. Most firms rely on internal initiatives without formal regulatory support, leading to inconsistencies in measurement and reporting practices. Therefore, the development of comprehensive implementation guidelines and targeted capacity building is essential to ensure standardized and effective application of green accounting. Overall, while green accounting has demonstrated positive impacts on environmental performance, its effectiveness is highly contingent on systemic integration and strong institutional support.

Results

Table 1. Summary of Green Accounting Practices and PROPER Performance

No	Company Name	Level of Green Accounting Implementation	Energy Efficiency Improvement (%)	Waste Reduction (%)	PROPER Rating
1	PT Energi Hijau Nusantara	Advanced	12%	18%	Gold
2	PT Mandiri Sejahtera Tbk	Moderate	8%	12%	Green
3	PT Indo Kimia Lestari	Advanced	15%	20%	Gold
4	PT Mega Industri Prima	Basic	5%	6%	Blue
5	PT Sumber Alam Abadi	Moderate	9%	11%	Green

(Source: Processed from interview and PROPER documentation data, 2024)

Table 2. Thematic Coding Summary from Interviews

No	Theme	Key Insights	Frequency Mentioned (n=5)
1	Environmental Cost Identification	All companies identified key environmental costs such as waste and energy use	5
2	Measurement Tools and Approaches	Some firms used activity-based costing systems for better accuracy	4
3	Internal Environmental Reporting	Only three firms had formal internal environmental reporting systems	3
4	Managerial Decision-Making	Environmental data was used to support investments in cleaner technologies	4
5	Implementation Barriers	Lack of technical capacity and standards emerged as key challenges	5

(Source: Thematic analysis of qualitative interviews, 2024)

Table 3. Comparative Environmental Performance Before and After Green Accounting Implementation

No	Company Name	Energy Use Before (kWh/year)	Energy Use After (kWh/year)	Waste Output Before (tons/year)	Waste Output After (tons/year)
1	PT Energi Hijau Nusantara	1,000,000	880,000	500	410
2	PT Mandiri Sejahtera Tbk	850,000	782,000	420	370
3	PT Indo Kimia Lestari	950,000	807,500	460	368
4	PT Mega Industri Prima	1,100,000	1,045,000	530	498
5	PT Sumber Alam Abadi	900,000	819,000	440	392

(Source: Company internal reports and sustainability performance data, 2024)

Discussion

The findings indicate a positive correlation between the implementation of green accounting and improvements in environmental performance. As shown in Table 1, companies with more advanced green accounting practices such as PT Energi Hijau Nusantara and PT Indo Kimia Lestari achieved higher energy efficiency (12–15%) and greater waste reduction (18–20%), which corresponded with superior PROPER ratings. This supports earlier research by Hassan et al. (2022), who found that structured environmental cost accounting leads to measurable sustainability outcomes. Additionally, the thematic analysis (Table 2) underscores that environmental cost identification and decision making based on environmental data are becoming integral to corporate governance, though internal reporting systems remain inconsistent. Table 3 further validates these outcomes by comparing quantitative performance before and after the adoption of green accounting. Despite these improvements, challenges such as limited standardization and technical capacity remain, echoing barriers identified in prior studies (Yuliana & Sari, 2021). These findings highlight the need for regulatory support and technical guidelines to ensure consistent application across industries.

Analysis of Green Accounting Practices and Environmental Performance

Table 1 presents a comprehensive overview of the relationship between the level of green accounting implementation and environmental performance, as reflected in energy efficiency improvements, waste reduction, and PROPER environmental ratings among five industrial companies in Indonesia. The companies featured PT Energi Hijau Nusantara, PT Mandiri Sejahtera Tbk, PT Indo Kimia Lestari, PT Mega Industri Prima, and PT Sumber Alam Abadi represent varying degrees of maturity in adopting green accounting practices. These

levels are categorized as “Basic,” “Moderate,” and “Advanced,” reflecting the extent to which environmental cost identification, measurement, and reporting have been embedded into each company’s internal management and reporting systems. Companies with more advanced green accounting practices recorded significantly better outcomes in both energy efficiency and waste reduction.

For instance, PT Indo Kimia Lestari, classified as having an “Advanced” level of green accounting integration, achieved a 15% improvement in energy efficiency and a 20% reduction in waste generation. This company also earned a “Gold” PROPER rating the highest level of environmental performance recognition awarded by Indonesia’s Ministry of Environment and Forestry. Similarly, PT Energi Hijau Nusantara, also in the “Advanced” category, improved its energy efficiency by 12% and reduced waste by 18%, likewise earning a “Gold” rating. On the other hand, PT Mega Industri Prima, which has only implemented green accounting at a “Basic” level, achieved just a 5% improvement in energy efficiency and a 6% reduction in waste, reflected in its “Blue” PROPER rating indicating minimum regulatory compliance with no additional sustainability initiatives. This pattern illustrates a direct correlation: the more comprehensively green accounting is applied, the greater the tangible improvements in environmental performance.

These findings align with previous research highlighting that structured environmental cost accounting enhances managerial control and drives operational efficiency (Hassan et al., 2022; Bebbington & Unerman, 2020). Moreover, the linkage between internal environmental data and external evaluations such as PROPER shows that green accounting not only improves internal processes but also plays a strategic role in enhancing corporate legitimacy and transparency. This is especially relevant in the context of ESG driven decision making among investors and regulators. Companies with a “Moderate” level of green accounting such as PT Mandiri Sejahtera Tbk and PT Sumber Alam Abadi demonstrated intermediate performance outcomes, with 8–9% improvements in energy efficiency, 11–12% waste reduction, and “Green” PROPER ratings, which signify proactive compliance and environmental management.

Thematic Insights on Green Accounting Integration

Table 2 summarizes the key themes that emerged from the qualitative interviews with company representatives involved in implementing green accounting. The thematic coding reveals five dominant themes: environmental cost identification, measurement tools and approaches, internal environmental reporting, managerial decision making, and

implementation barriers. Each theme provides valuable insight into how companies operationalize environmental accounting and the institutional dynamics that support or hinder its effectiveness. The frequency column indicates how many of the five interviewed companies mentioned each theme, reflecting its perceived importance and relevance within their organizational context.

The first theme, environmental cost identification, was consistently mentioned by all informants (5 out of 5). Companies uniformly acknowledged the significance of recognizing key environmental costs such as waste disposal, energy consumption, and emissions. This step forms the foundation for any green accounting initiative, as without clear identification of environmental costs, measurement and management efforts become superficial. The second theme measurement tools and approaches was highlighted by four companies, indicating some variation in methodology. While larger firms tend to adopt activity based costing (ABC) for tracking environmental expenses, smaller or less-resourced companies often rely on traditional financial tracking without environmental dimensions, revealing a gap in methodological standardization.

The third theme, internal environmental reporting, emerged in only three out of five firms, reflecting that formalized and structured reporting remains limited. This limitation hinders systematic data flow from operational units to strategic decision makers, reducing the overall impact of green accounting on long term planning. In contrast, the fourth theme, managerial decision-making, appeared in four cases, showing that where data is available even informallyit is often used to guide investment decisions in energy efficient technologies or sustainable production processes. This reinforces the view that green accounting supports sustainability not just by tracking performance but also by influencing strategic direction.

Comparative Analysis of Environmental Performance Before and After Green Accounting Implementation

Table 3 presents a comparative assessment of environmental performance indicators specifically energy consumption and waste output before and after the implementation of green accounting practices in five selected companies. This longitudinal perspective provides concrete evidence of the operational impact of green accounting integration. The companies analyzed include PT Energi Hijau Nusantara, PT Mandiri Sejahtera Tbk, PT Indo Kimia Lestari, PT Mega Industri Prima, and PT Sumber Alam Abadi. Each of these firms reported significant environmental improvements following the adoption of environmental cost

identification, monitoring, and reporting procedures, albeit with varying degrees of magnitude depending on the depth of implementation.

As seen in the table, all companies experienced a reduction in both energy use and waste output after adopting green accounting. For example, PT Indo Kimia Lestari achieved the most substantial improvements, decreasing its annual energy consumption from 950,000 kWh to 807,500 kWh a 15% reduction and reducing its waste output from 460 to 368 tons per year. Similarly, PT Energi Hijau Nusantara reduced its energy use by 12% and waste output by 18%, indicating that effective environmental cost tracking enables firms to optimize their operations and adopt cleaner technologies. In contrast, PT Mega Industri Prima showed more modest improvements, reducing energy use by only 5% and waste by 6%, which corresponds with its lower level of green accounting implementation as previously shown in Table 1.

These results validate the theoretical proposition that green accounting facilitates data driven environmental management by providing accurate and timely information for operational decision making (Bansal & Song, 2023; Rahman & Alam, 2023). The observed reductions in resource consumption and pollution levels reflect the practical utility of internalizing environmental costs and linking them to performance metrics. Moreover, the comparative nature of the data underscores that the depth of green accounting adoption is a key determinant of the extent of environmental performance improvements. Firms that only adopt superficial or fragmented approaches tend to achieve marginal gains, while those that institutionalize green accounting as part of broader sustainability strategies demonstrate significant progress.

5. CONCLUSION AND SUGGESTIONS

Conclusion

This study concludes that green accounting plays a pivotal role in enhancing corporate environmental performance, particularly in the context of developing economies like Indonesia. The empirical evidence gathered from five manufacturing firms indicates that the integration of environmental cost identification, measurement, and internal reporting leads to measurable improvements in operational efficiency, especially in energy use and waste management. Companies that adopted green accounting at an advanced level consistently demonstrated better outcomes, both in environmental metrics and in achieving higher PROPER ratings from the Ministry of Environment and Forestry. These findings affirm that green accounting is not merely a compliance mechanism but a strategic management tool that strengthens environmental governance, supports decision making, and enhances corporate

legitimacy in the eyes of stakeholders. However, the study also reveals that many firms still face challenges in implementation, primarily due to the lack of standardized procedures, insufficient technical capacity, and limited institutional support.

Suggestions

In light of the conclusions drawn, several recommendations are proposed to promote broader and more effective adoption of green accounting in Indonesia. First, policymakers should establish comprehensive regulatory frameworks and technical guidelines that provide standardization while remaining adaptable to industry specific needs. These frameworks should define key environmental cost elements, accounting methodologies, and minimum reporting requirements. Second, companies should invest in capacity building initiatives, such as training programs and professional development for accounting and sustainability teams, to ensure technical competence in applying environmental accounting tools. Third, it is essential for firms to align green accounting practices with broader corporate strategies, integrating environmental metrics into performance evaluations, budgeting, and investment decisions. Lastly, future academic research should explore the long-term financial implications of green accounting adoption and examine its interactions with other sustainability instruments such as ESG reporting and environmental certifications. These steps are necessary to transform green accounting from a niche practice into a mainstream pillar of sustainable business management.

ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to all parties who supported the completion of this research. Special appreciation is extended to Universitas Bina Sarana Informatika (UBSI) for providing the facilities, opportunities, and resources that made this study possible. The authors also thank the representatives from the participating manufacturing companies for their valuable time and willingness to share insights during the interviews, which greatly enriched the data analysis. Lastly, the authors are grateful to the editorial team of the Journal of Management, Business, and Entrepreneurship (JUMBIKU) for the opportunity to publish this research

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