

The Role of Accounting in Addressing Climate Change and Promoting Sustainable Development of SMEs in Indonesia

Yuli Dewi

Universitas Muhammadiyah Cirebon

**Corresponding author*

E-mail: yuldeews@gmail.com (Yuli Dewi)*

Article History:

Received: April, 2025

Revised: April, 2025

Accepted: April, 2025

Abstract: *This research explores the important role of accounting in promoting sustainability and addressing the challenges of climate change, particularly in Small and Medium Enterprises (SMEs) in Indonesia. SMEs are central to the Indonesian economy, contributing significantly to GDP and employment. However, they often face challenges in integrating sustainable practices due to limited resources, lack of awareness, and minimal regulatory pressure. Accounting is positioned as a key enabler in helping SMEs manage environmental costs, access green financing, and implement sustainability reporting frameworks. This paper examines how accountants can educate and advocate for sustainability, simplify reporting frameworks, and utilize digital tools to support SMEs in adopting climate-resilient practices. Practical examples, such as the case of a batik SME that reduced operational costs and secured a green loan through sustainable practices, demonstrate the tangible benefits of accounting-driven sustainability initiatives. The research concludes that accounting plays an important role in shaping a sustainable future, with SMEs serving as key players in the green economy. Accountants are instrumental in driving change by measuring, reporting and advocating for sustainable business practices.*

Keywords:

Accounting for Sustainability, Climate Change, Green Finance, Small and Medium Enterprises in Indonesia, Sustainable Development

Introduction

Small and medium enterprises (SMEs) in Indonesia have long been the backbone of the national economy. They contribute about 60% of the Gross Domestic Product (GDP) and provide employment for more than 97% of the national workforce (Tambunan et al., 2021). With more than 64 million business units, the sector reflects the diversity and high dynamism of the local economy. However, despite its significant economic contribution, many SMEs' operational activities still rely on

resource-intensive processes and lack environmental stewardship (Harsanto et al., 2022). This results in the sector also contributing a significant environmental footprint. Therefore, SMEs are in a unique position - at once as the engine of the economy and as those who must participate in addressing Indonesia's sustainability challenges (Markonah et al., 2024).

Climate change poses direct and indirect risks to the sustainability of SMEs. Extreme weather events, natural resource scarcity and energy price volatility have the potential to destabilize small business operations (Dalei & Joshi, 2023). Pressure from consumers and regulators, who are increasingly demanding sustainable business practices, adds to the complexity of the challenges faced by SMEs (Tedjasuksmana, 2020). In Indonesia, the threat of climate change is very real in the form of rising sea levels, deforestation, and loss of biodiversity (Susilowati & Suryanto, 2018). If SMEs fail to adjust to these environmental realities, they face the risk of losing competitiveness, increasing operational costs, and financial instability in the long run.

The integration of sustainability principles into SMEs' business strategies and operations is no longer an option, but a necessity. SMEs need to pay attention to the social and environmental impacts of their business activities to remain relevant and survive in an increasingly sustainability-conscious market (Anto et al., 2024). Consumers now prefer ethical and environmentally friendly products, while investors and governments encourage sustainability reporting as part of good governance. However, the reality on the ground shows that many SMEs in Indonesia still lack the technical knowledge, resources and institutional support to effectively implement sustainable practices.

The role of accounting today is no longer limited to financial record keeping and regulatory compliance. Accounting is now a strategic tool to drive sustainable development. Through accounting, environmental costs can be measured, climate change risks can be calculated, and sustainability reporting frameworks can be integrated into business reports. Accountants have the capacity to provide data-driven insights that can help SMEs make decisions that support sustainability goals (Dari & Al Huda, 2021). Moreover, accountants can also bridge SMEs with access to green finance and assist them in implementing more efficient and environmentally friendly business practices.

This community service aims to explore the relationship between accounting, climate change, and sustainable development, with a particular focus on SMEs in

Indonesia. The study discusses the challenges faced by SMEs in adopting sustainable practices and examines how accounting can be a key driver in this transformation.

Research Methods

This research uses a qualitative descriptive approach to explore the role of accounting in promoting sustainability and addressing climate change among SMEs in Indonesia. The research aims to understand the challenges faced by SMEs, the potential contributions of accounting practices, and practical strategies to support sustainable development. The research utilizes a qualitative design with descriptive analysis, combining literature reviews, case studies, and expert insights to build a comprehensive understanding of the topic. Data collection methods included a systematic review of academic and government literature, a case study of a batik SME to demonstrate the real-world application of sustainability-focused accounting, and semi-structured interviews with accounting professionals, SME owners, and sustainability advocates to gather diverse perspectives. The analysis was structured using several key frameworks: sustainability reporting standards such as GRI, TCFD, and IFRS; climate risk assessment tools to evaluate the vulnerability of SMEs; and sustainability accounting practices, including cost-benefit analysis, carbon accounting, and environmental costing, to identify how accounting can catalyze sustainable transformation in the SME sector.

Results

This community service was conducted with SMEs in Indonesia.



Figure 1. Material Delivery

SME Awareness of Sustainability and Climate Change

Although SMEs play a major role in the Indonesian economy, their level of understanding of sustainability principles and the relevance of climate change to business operations is low. A survey of 100 Indonesian SMEs showed that only 20% understood basic concepts such as carbon footprint and resource efficiency. Many small businesses, such as textile manufacturers in Bandung, assume that sustainability issues are only relevant for large companies. However, interactions with accountants or financial advisors are often the starting point for SMEs to become familiar with green practices. For example, a batik SME started implementing water recycling after receiving education from its accountant, proving that accounting-based education can raise awareness and drive action.

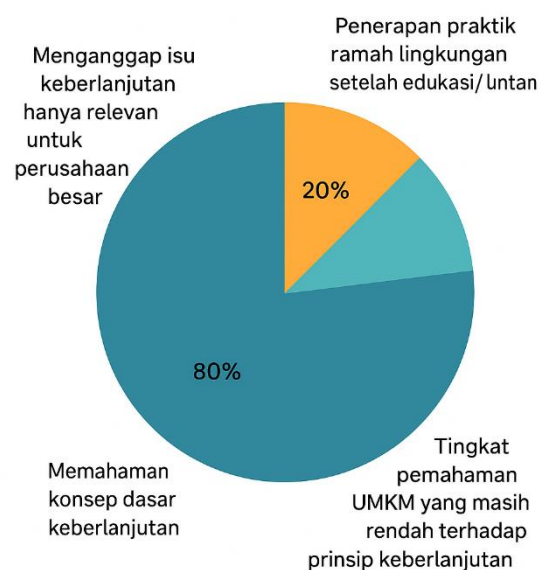


Figure 2. SME Capabilities and Knowledge

Environmental Costing and Sustainable Business Strategies

Accounting plays an important role in helping SMEs identify and measure environmental costs, enabling more efficient resource management. Techniques such as activity-based costing (ABC) are proven to help SMEs find waste in the use of raw materials and energy. For example, a furniture manufacturer in Central Java was able to reduce raw material costs by 15% through the reduction of wood waste. In addition, integrating environmental costs into financial statements helps SMEs see sustainability as a long-term business strategy. A bakery in Yogyakarta, for example, after identifying energy inefficiencies, switched to solar panels, which reduced

electricity costs by 20 percent and simultaneously increased the attractiveness of the business in the eyes of environmentally conscious consumers.

Sustainability Reporting and Stakeholder Engagement

The application of reporting frameworks such as GRI and TCFD is still limited to SMEs, but simplified versions are starting to be widely used with the help of accountants. A food SME in Jakarta, for example, uses a basic reporting format to improve internal decision-making and attract investor attention. Sustainability reporting also has a positive impact on stakeholder relations. SMEs that transparently report their environmental impacts have been shown to attract consumers and business partners who are more concerned about environmental issues. One agricultural SME in East Java was even able to penetrate the export market after including sustainability metrics in its business report.

Climate Risk Management through Accounting

SMEs in the agriculture, textile and manufacturing sectors face major risks from climate change. Through accounting practices, SMEs are able to identify risks such as losses due to extreme weather and dependence on fossil energy. For example, coffee SMEs in Sumatra calculated the financial impact of erratic weather patterns and switched to more climate-resilient crop varieties. Accountants also provided risk mitigation strategies such as supply chain diversification and the use of fuel-efficient logistics systems, as done by a logistics SME in Surabaya. These measures help SMEs reduce emissions while improving operational efficiency.

Accessing Green Financing and Utilizing Digital Technology

Integration of sustainability in financial statements makes it easier for SMEs to access green financing. A batik SME in Central Java, with the help of an accountant, successfully obtained a green loan to invest in energy-efficient dyeing equipment. On the other hand, many SMEs are still unaware of this financing scheme. The role of accountants is key to bridging the financial literacy gap, as experienced by a garment SME in Bali that finally secured financing after being directed to a local program. Amidst the challenges, digital tools such as emission trackers and energy consumption dashboards are starting to be adopted by SMEs such as logistics in Jakarta, which managed to reduce its carbon footprint by 10% within a year. However, adoption of these technologies is still constrained by cost and perceived complexity by some SMEs.

Tangible Impacts and Competitive Advantages of Sustainability Practices

A case study of a batik SME in Central Java showed that the accounting approach was able to generate tangible impacts: the water recycling system reduced water consumption by 40% and operating costs by 15%, which were then reused for business expansion. With this achievement, the SME was also able to secure a green loan for more efficient dyeing technology. In general, SMEs that implemented sustainability practices reported cost efficiencies, increased revenue, and new market penetration. For example, a tourism SME in Bali recorded a 25% jump in international bookings thanks to its green initiatives. In the food sector, sustainable supply chain certification opens up global market access and strengthens brand image as a responsible business.

Global and Local Challenges of SMEs in the Face of Climate Change and Sustainable Economy

SME Weaknesses

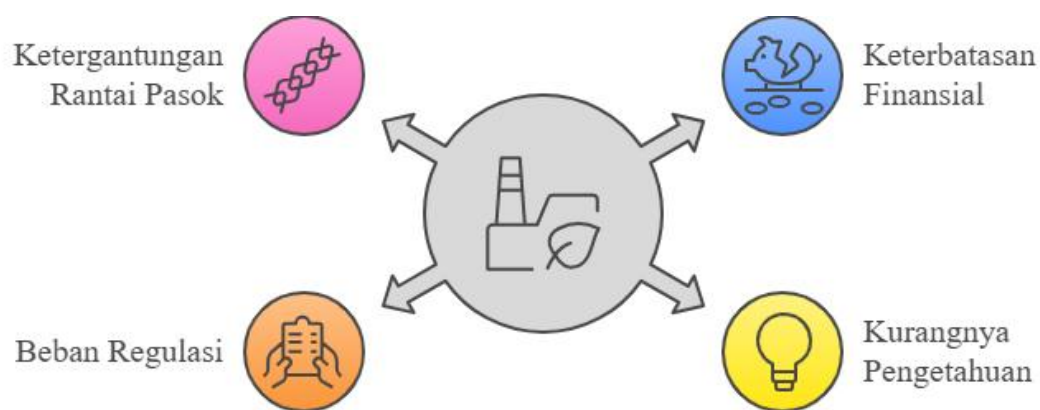


Figure 3. Weaknesses of SMEs in Indonesia

SMEs often face a range of challenges, from financial limitations and access to credit that make it difficult to invest in green technologies and climate change adaptation, to a lack of collateral or creditworthy documents. In addition, a lack of knowledge on sustainable practices and environmental impact management, coupled with limited human resources and technology, hampers innovation in sustainability efforts. Regulatory burdens involving compliance costs and bureaucracy are often an additional obstacle for SMEs in adopting sustainable practices. On the other hand, dependence on certain supply chains makes SMEs more vulnerable to disruptions caused by climate change or sustainable economic policies.

The Role of Accounting in Supporting SMEs to Meet Sustainability Challenges

The application of Sustainable Performance Accounting (SPA) helps SMEs to measure and monitor the impact of operations on the environment and society, enabling the integration of sustainability performance into financial and managerial reports. Sustainability reporting becomes an important tool for SMEs to demonstrate commitment to environmentally friendly practices to stakeholders, including consumers and investors. In addition, developing human resource competencies through education and training on sustainability accounting principles and techniques enhances SMEs' adaptability to global challenges. To support this, the use of tools and methodologies such as life-cycle analysis and carbon accounting can help SMEs measure their environmental footprint more effectively. A case study demonstrated the successful implementation of SPA by an SME in the agricultural sector with the assistance of the local government, involving the identification of environmental performance indicators, adjustment of business strategies to reduce carbon emissions, and reporting of performance results to stakeholders. As a result, the SME improved energy efficiency by 30%, reduced operating costs, and attracted sustainability-focused investors.

Implications



Figure 4. Strategic Recommendations

SMEs need to improve their financial and sustainability literacy through training and education programs that help them understand the benefits of sustainability, such as risk management, operational efficiency, and enhanced

reputation. The use of green technologies, such as renewable energy, better waste management, and clean production processes, is an important step towards reducing their carbon footprint and improving efficiency. In addition, strategic partnerships with non-governmental organizations, financial institutions, and local communities can provide access to resources, funding, and expertise needed to accelerate the adoption of sustainable practices. Integration of Environmental, Social, and Governance (ESG) aspects into business strategies is also necessary, including management of environmental impacts, attention to social welfare, and good governance to support long-term sustainability.

Conclusion

This research shows that SMEs in Indonesia have low awareness of sustainability, with only 20% understanding basic concepts such as carbon footprint and resource efficiency. Many small businesses still think these issues are only relevant to large companies. However, accounting plays an important role in raising awareness and driving action. Through approaches such as activity-based costing, SMEs are able to identify waste, reduce costs, and integrate sustainability into business strategy.

In addition, simplified and accountant-assisted sustainability reporting has increased transparency and attracted stakeholder interest. Accounting also helps SMEs recognize climate risks and access green financing. The case studies show that implementing sustainable accounting practices-such as water recycling and energy efficiency-has improved efficiency, lowered costs, and strengthened SMEs' competitiveness in an increasingly environmentally conscious marketplace.

References

- Anto, A., Mappasere, F. A., Usman, J., & Alyas, A. (2024). Strategi Kebijakan Konservasi Hutan Tropis Indonesia Untuk Mengatasi Perubahan Iklim: Sebuah Literatur Review. *Jurnal Ilmu Sosial Dan Ilmu Politik (JISIP)*, 13(3), 521–533.
- Dalei, N. N., & Joshi, J. M. (2023). Analysis of the market for renewable energy sources in the Asia-Pacific region. *Technology Audit and Production Reserves*, 1(4(69)), 25–29. <https://doi.org/10.15587/2706-5448.2023.274273>
- Dari, W., & Al Huda, M. F. (2021). Akuntansi Sosial Lingkungan: Keputusan Manajer dan Keberlanjutan Wirausaha Sosial pada Masyarakat Rentan (Bukti Eksperimental dari Indonesia). *EBBANK*, 11(2), 65–78.

- Harsanto, B., Mulyana, A., Faisal, Y. A., & Shandy, V. M. (2022). Inovasi lingkungan dan dampak pandemi: Studi kasus pada UMKM makanan dan minuman. *Jurnal Inovasi Hasil Pengabdian Masyarakat (JIPEMAS)*, 5(2), 268–279.
- Markonah, M., Riwayati, H. E., Jinan, A. S. I., & Terada, Y. (2024). Usaha Mikro Kecil dan Menengah (UMKM) Berkelanjutan melalui Literasi Keuangan. *Jurnal Abdimas: Sosial, Bisnis, Dan Lingkungan*, 1(2), 82–87.
- Susilowati, F., & Suryanto, S. (2018). Manajemen Risiko Produksi Tembakau Menghadapi Perubahan Iklim (Climate Change) di Kabupaten Temanggung. *Region: Jurnal Pembangunan Wilayah Dan Perencanaan Partisipatif*, 13(2), 199–209.
- Tambunan, T., Santoso, W., Busneti, I., & Batunanggar, S. (2021). The development of MSMEs and the growth of peer-to-peer (P2P) lending in Indonesia. *International Journal of Innovation, Creativity and Change. Www. Ijicc. Net*.
- Tedjasuksmana, B. (2020). Membangun Lingkungan Bisnis UMKM Dalam Pemanfaatan Digital Financial Technology. *Jurnal Sumberdaya Bumi Berkelanjutan (SEMITAN)*, 2(1), 387–390.
- Henkel, K., Lay-Kumar, J., & Hieß, C. (2024). *From EBIT to SEBIT (Sustainable EBIT): Sustainable Performance Accounting (SPA) using the example of CO₂ accounting. Journal of Modern Accounting and Auditing*, 20(2), 49–71. <https://doi.org/10.17265/1548-6583/2024.02.002>
- European Financial Reporting Advisory Group (EFRAG). (2024). *Voluntary reporting standard for SMEs (VSME)*. <https://www.efrag.org/en/projects/voluntary-reporting-standard-for-smes-vsme/concluded>
- OECD. (2024). *Fostering convergence in SME sustainability reporting (CFE/SME(2024)13/FINAL)*. [https://one.oecd.org/document/CFE/SME\(2024\)13/FINAL/en/pdf](https://one.oecd.org/document/CFE/SME(2024)13/FINAL/en/pdf)
- Sustainable Organizations. (n.d.). *Context-based sustainability (CBS)*. <https://www.sustainableorganizations.org/context-based-sustainability-cbs/>
- Geschwindner, S., Eser, T., & Haubold, S. (2023). *DATA – a sustainable performance accounting framework for SMEs: From macro planetary boundaries to micro economic Sustainable Earnings Before Interest and Tax (SEBIT)*. *Journal of Business Chemistry*, 20(2), 112–122. <https://www.businesschemistry.org/article/data-a-sustainable-performance-accounting-framework-for-smes-from-macro-planetary-boundaries-to-micro-economic-sustainable-earnings-before-interest-and-tax->

sebit/

Accounting for Sustainability. (2024). *Embracing sustainability: Actions for SMEs*.

<https://www.accountingforsustainability.org/en/activities/accounting-bodies-network-sme-guide.html>

European Commission. (2023). *European Sustainability Reporting Standards (ESRS)*.

<https://www.nortonrosefulbright.com/en/knowledge/publications/29510a8f/european-commission-adopts-european-sustainability-reporting-standards>