

Analyzing the Impact of Internal Factors on MSME Environmental Management for Sustainable Development in Aceh Tamiang Regency

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ABSTRAK

Pertumbuhan Usaha Mikro, Kecil, dan Menengah (UMKM) belum sepenuhnya didukung oleh penerapan strategi manajemen yang berorientasi pada kelestarian lingkungan. Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor internal yang memengaruhi pengelolaan limbah secara ramah lingkungan oleh UMKM, serta mengukur kontribusinya terhadap pembangunan berkelanjutan di Kabupaten Aceh Tamiang. Fokus utama penelitian ini adalah menilai sejauh mana struktur organisasi, pengelolaan sumber daya, dan kesadaran lingkungan dalam UMKM memengaruhi pemberdayaan berkelanjutan, khususnya pada sektor yang menghasilkan limbah. Populasi penelitian terdiri dari 965 UMKM penghasil limbah, dengan sampel sebanyak 300 responden yang dipilih menggunakan teknik purposive sampling agar sesuai dengan kriteria penelitian. Data dikumpulkan melalui kuesioner terstruktur dan dianalisis menggunakan teknik Structural Equation Modeling (SEM) dengan bantuan perangkat lunak AMOS. SEM dipilih karena mampu menguji hubungan kompleks antar variabel secara simultan dan memberikan validitas yang kuat terhadap model teoritis. Hasil penelitian menunjukkan bahwa faktor internal perusahaan, seperti demografi, sumber daya manusia, budaya perusahaan, praktik manajemen, pemasaran, kemampuan inovasi, kesadaran karyawan, berpengaruh signifikan terhadap pemberdayaan UMKM dalam menerapkan praktik ramah lingkungan. Lebih lanjut, pemberdayaan ini terbukti memberikan kontribusi positif terhadap pembangunan berkelanjutan, baik dalam bentuk pengurangan dampak lingkungan maupun peningkatan efisiensi ekonomi. Temuan ini penting bagi pengambil kebijakan di Aceh Tamiang dalam merancang strategi dan kebijakan berbasis keberlanjutan untuk pengembangan UMKM lokal.

Kata kunci: Lingkungan Internal, Pemberdayaan UMKM Berbasis Pengelolaan Lingkungan, Pembangunan Berkelanjutan

ABSTRACT

The growth of Micro, Small and Medium Enterprises (MSMEs) has not been fully supported by the implementation of environmentally sustainable management strategies. This study aims to identify internal factors influencing environmentally friendly waste management among MSMEs and to measure their contribution to sustainable development in Aceh Tamiang Regency. The main focus is to assess how organizational structure, resource management, and environmental awareness within MSMEs affect sustainable empowerment, particularly in sectors that generate waste. The study population consists of 965 waste-producing MSMEs, with a sample of 300 respondents selected using purposive sampling to match the research criteria. Data was collected through structured questionnaires and analyzed using Structural Equation Modeling (SEM) with the assistance of AMOS software. SEM was chosen for its ability to test complex relationships among variables simultaneously and provide strong validity for the theoretical model. The findings show that internal company factors such as demographics, human resources, corporate culture, management practices, marketing, innovation capability, and employee awareness significantly influence MSME empowerment in adopting environmentally friendly practices. Furthermore, this empowerment contributes positively to sustainable development by reducing environmental impacts and improving economic efficiency. These findings are important for policymakers in Aceh Tamiang in designing sustainability-based strategies and policies for the development of local MSMEs.

Keywords: Internal Environment, Empowerment of MSMEs Based on Environmental Management, Sustainable Development

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1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a pivotal role in Indonesia's economy,

particularly in terms of the number of business units and employment absorption. According to data from the Central Bureau of Statistics (BPS) reported by the

Ministry of Cooperatives and SMEs (Badan Pusat Statistik, 2017), 99.99% of all business actors in Indonesia are MSMEs, with the remaining 0.01% being large enterprises. In terms of employment, MSMEs significantly contribute by providing vast job opportunities across various sectors. They also make substantial contributions to national revenue by accounting for 61.9% of the Gross Domestic Product (GDP) through tax payments. Specifically, the micro-enterprise sector contributes 36.28% of GDP, the small enterprise sector 10.9%, and the medium enterprise sector 14.7%. In contrast, the large enterprise sector contributes only 38.1% of GDP through tax payments (Badan Pusat Statistik, 2017).

The dominance of MSMEs is evident in both urban and rural economies. Highlights that MSMEs serve as the main actors in economic activities across diverse sectors, being the largest employers, driving regional economic development and community empowerment, creating new markets and innovations, and, for those engaged in international trade, contributing to the balance of payments through exports. Despite their significant economic contributions, the development of MSMEs in terms of quantity has not been matched by environmentally-based management practices. Business actors often neglect environmental preservation during production processes and waste management. However, companies, regardless of their size, should implement environmental management systems in their operations to foster a positive corporate image and promote sustainability. Lahallo et al. (1996) assert that a company's performance is influenced by Corporate Social Responsibility (CSR) and ethical responsibilities, which promote good practices in waste management, prevent environmental pollution, and support initiatives such as reforestation and urban greening (Lahallo et al., 2022; Rifanjani, 2024; Wunder et al., 2015).

The implementation of community businesses that support environmental sustainability is gaining attention alongside increasing public awareness due to the prevalence of environmental degradation caused by economic activities (Warger, 2015). A shift towards environmentally conscious business orientations is expected not only to provide positive environmental impacts but also to enhance the competitiveness of MSMEs. Climate change poses a significant threat to environmental sustainability in Indonesia. The country's rich natural resources are a primary asset for development. Bank Indonesia (2017) emphasizes that renewable natural resources can be managed to generate sustainable income, while non-renewable resources should be channeled to develop human resources and produced capital. Nevertheless, environmental damage is fundamentally caused by human activities aimed at fulfilling needs, where excessive exploitation without adequate rehabilitation diminishes the environment's capacity to support future human activities (Bank Indonesia, 2017).

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MSMEs, as primary economic actors meeting human needs, inadvertently contribute to environmental degradation through activities ranging from raw material acquisition to production processes and waste generation. Efforts by government and related agencies to mitigate these impacts have not yielded significant results in reducing or preventing environmental damage due to low community awareness, inadequate policy enforcement, and unsynchronized policies across institutions (Tang, 2012; Ortas, 2014; Feng, 2016). The community directly feels the adverse effects of environmental damage, especially business actors affected by declining quality and productivity of natural resources. Business actors in Indonesia are still predominantly MSMEs, accounting for 99.99% of total business units or approximately 53.8 million units, comprising 53.2 million micro, 573.6 thousand small, and 42.6 thousand medium enterprises. Sectorally, MSMEs are most dominant in the agricultural sector at 49.6%, aligning with labor absorption of 43.0% of total employment. Consequently, environmental damage poses a serious threat to the MSME sector (Yong, 2016).

In Aceh Province, the number of MSMEs has reached nearly 75,000 units, with key sectors including souvenir production and traditional food processing, experiencing a growth rate of approximately 15.77% per year between 2012 and 2015 (Hariyanto, 2017). Specifically, Aceh Tamiang Regency has about 3,258 MSMEs, predominantly in the trade and industrial sectors (Disperindag Aceh Tamiang, 2017). However, data on MSMEs with environmentally friendly business permits are lacking, indicating insufficient guidance towards sustainable practices. This suggests that Aceh Tamiang lacks effective programs to foster environmentally friendly MSMEs that support the planned sustainable development (Lestari et al., 2023).

The selection of this research topic is driven by the urgent need to enhance environmental awareness in the development of MSMEs, particularly in Aceh Tamiang Regency, which has high economic potential but lacks in the application of sustainable environmental practices. While numerous studies have highlighted the economic role of MSMEs, there is still a limited body of research that specifically examines empowerment models for environmentally-based MSMEs that are aligned with sustainable development in regional contexts. This indicates a knowledge gap in understanding how internal environmental factors can be strategically leveraged to facilitate the transformation of MSMEs toward environmentally friendly business practices. The significance of this study lies in its theoretical contribution by offering a conceptual model that connects internal environmental factors, MSME empowerment, and sustainable development. Practically, the findings of this study can serve as a reference for local governments and stakeholders in

formulating more effective policies and assistance programs to guide MSMEs in contributing to sustainable development goals (SDGs), particularly in the areas of green economy and responsible natural resource management.

Structural Equation Modeling (SEM) becomes highly relevant in this context, as it provides a robust statistical approach to examine the complex causal relationships among latent variables such as organizational capacity, empowerment efforts, and sustainability outcomes. SEM is especially advantageous due to its ability to handle multiple dependence relationships simultaneously, incorporate measurement errors, and analyze both direct and indirect effects in a comprehensive model. In the context of this research, SEM enables the analysis of how internal factors such as organizational capabilities and resources affect the empowerment of MSMEs, and how that empowerment, in turn, contributes to sustainable development in Aceh Tamiang Regency.

The application of SEM in this study is also supported by extensive literature which suggests that SEM is widely used in social science research to test complex theoretical frameworks involving latent constructs. It offers deeper insights into the underlying mechanisms and mediating variables influencing the outcomes of MSME empowerment programs. Therefore, the use of SEM in this study is expected to not only validate the theoretical model but also identify key leverage points for improving the sustainability performance of MSMEs through environmentally conscious empowerment strategies.

The MSMEs in Aceh Tamiang face challenges such as lack of government supervision and guidance regarding environmental permits, high costs, and complexities in obtaining environmental approvals like Environmental Impact Analysis (AMDAL). Additionally, the majority of MSME actors have low educational backgrounds, making it difficult for them to comprehend and implement environmental management systems. For many, the primary focus is on generating income to improve household finances, viewing environmental regulations as burdensome. Empowerment initiatives for MSMEs in Aceh Tamiang have not been consistently implemented due to the absence of specific regional regulations aimed at fostering environmentally friendly business practices. There is an urgent need for the government to provide programs that assist in preventing or reducing environmental damage through good governance and sustainable development strategies. Community empowerment should focus on forming business groups aligned with regional economic potentials and community capabilities, considering internal environmental challenges faced by MSMEs (Disperindag Aceh Tamiang, 2017).

Developing appropriate business models for each group, based on local economic potentials and natural resources, aims to find solutions and strategic steps to transform MSMEs in Aceh Tamiang into

environmentally friendly businesses. This transformation supports the Ministry of Environment's objective of achieving integrated natural resource and environmental management policies to promote sustainable development, with an emphasis on a green economy in Aceh Tamiang. Sustainable development is crucial for Aceh Tamiang to alleviate poverty, remain competitive, and achieve economic excellence, thereby positioning itself alongside other prosperous regions. However, the lack of environmental awareness among the community, coupled with insufficient government education on environmental management, hinders the realization of sustainable development. MSME actors focus primarily on increasing income to improve household economies, often neglecting environmental considerations.

There is a critical need for government intervention to educate and guide MSME actors in adopting environmentally friendly practices, ensuring that economic activities not only benefit the present but are also sustainable for future generations (Mukim, 2015). According to J. Ahluwalia and U. Patel (2018), sustainable development must balance the exploitation of natural resources to reduce poverty with the need to prevent environmental degradation, ensuring that basic needs are met without compromising the ability of future generations to meet theirs. Therefore, this research aims to analyze the forms of empowerment for MSMEs based on environmental management that can support sustainable development in Aceh Tamiang Regency (Ahluwalia et al., 2018; Endrikat et al., 2014).

Based on the aforementioned background, this study aims to examine the relationship between internal environmental factors including demographics, human resources, corporate culture, management practices, marketing, innovation capability, organizational learning, and employee awareness and the empowerment of MSMEs based on environmental management, as well as their impact on sustainable development in Aceh Tamiang Regency. Furthermore, the study investigates the mediating role of MSME empowerment in linking these internal factors to sustainable development.

The objective of this research is to analyze the influence of internal environmental factors namely demographics, human resources, corporate culture, management practices, marketing, innovation capability, organizational learning, and employee awareness on the empowerment of MSMEs based on environmental management and its impact on sustainable development in Aceh Tamiang Regency, while also evaluating the mediating role of MSME empowerment in the relationship between internal environmental factors and sustainable development.

2. METHODS

This study utilizes a survey-based approach with a descriptive quantitative research method within a research and development (R&D) framework, aimed

at exploring the roles of internal factors in empowering environmentally friendly Micro, Small, and Medium Enterprises (MSMEs) that support sustainable development in Aceh Tamiang Regency. The research seeks to identify effective policies and strategies to overcome various internal challenges that MSMEs face, enabling them to become environmentally responsible businesses through environmental management practices. This effort aligns with the sustainable development programs initiated by the Aceh Tamiang government, designed to improve the community's quality of life. Through this empowerment program based on environmental management, MSMEs in Aceh Tamiang are expected to not only remain competitive but also provide lasting benefits, supporting sustainable development for both the current community and future generations.

2.1. Sampling Method

The sampling technique used in this study is purposive sampling, conducted randomly to select respondents or samples representing 12 sub-districts based on specific criteria. The criteria for selecting respondents are as follows:

1. Respondents must be Micro, Small, and Medium Enterprise (MSME) entrepreneurs who are native residents of Aceh Tamiang Regency.
2. Respondents' age must range between 17 and 60 years, considered a productive age for entrepreneurship and household responsibilities.
3. Respondents must have an educational background of at least high school (SLTA) up to a bachelor's degree (Strata 1), ensuring their capability to comprehend the questions related to MSME topics.
4. Respondents must utilize the natural resources of Aceh Tamiang Regency as a livelihood source, which in turn impacts the environment through their production or business activities.

5. The business must generate waste either in the production process or through trading activities.
6. Respondents must be entrepreneurs who have not yet received training in environmentally friendly business management.

2.2. Data Analysis

The data analysis process consists of several stages, starting from data cleansing, descriptive statistical analysis, and then Structural Equation Modeling (SEM) analysis using AMOS software. Descriptive statistics are used to provide a general overview of the variables under study. Subsequently, the relationships between the internal environment and the empowerment of SMEs based on environmental management are analyzed to assess the overall model fit and to test the significance and strength of the relationships among the variables.

3. RESULTS AND DISCUSSION

The results of data processing regarding the role of several internal environmental factors in empowering small business communities to adopt environmentally friendly practices are demonstrated through the full model analysis. This model was examined using Structural Equation Modeling (SEM), supported by AMOS software, which enabled a comprehensive evaluation of the relationships between variables. The SEM approach provides a detailed understanding of how internal factors such as organizational culture, leadership, employee competence, and resource availability influence the ability of small business communities to engage in sustainable environmental management. The structural design of this model, including the pathways and interactions among the latent constructs, is clearly illustrated in Figure 1, serving as a visual representation of the theoretical framework and empirical findings of the study.

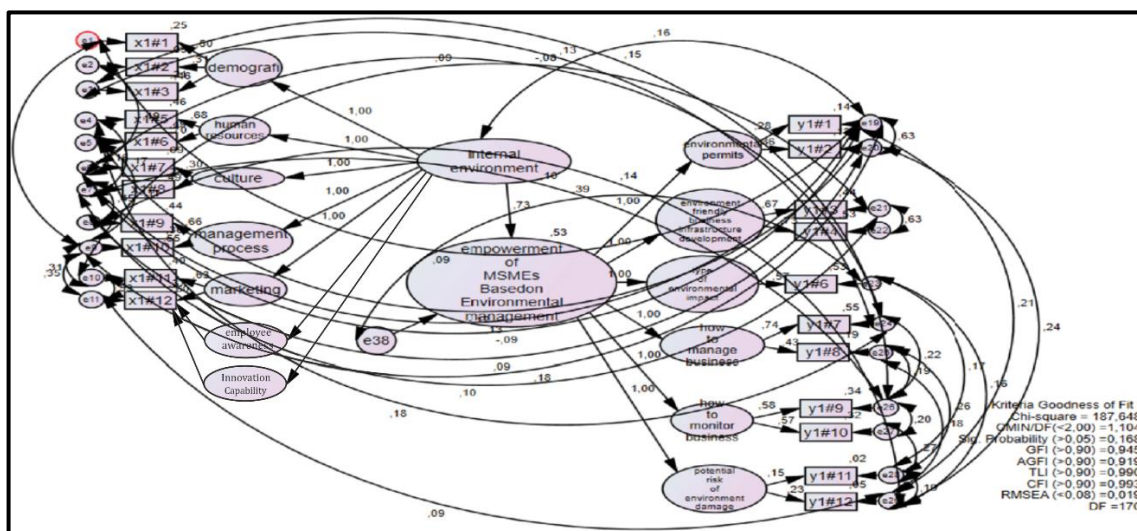


Figure 1. Structural Model SEM

The adequacy of the model can be evaluated by referring to the Goodness of Fit (GoF) metrics presented in Table 1. These metrics provide an assessment of how well the proposed model aligns with the observed data and how accurately the predictions generated by the model match the actual outcomes. GoF measures the extent to which the model can capture the underlying structure or patterns in the data, and how well it aligns relevant variables to produce valid and consistent results. By using these metrics, researchers can determine whether the model delivers acceptable and reliable results that accurately reflect the real-world phenomenon being analyzed. Moreover, GoF allows for the identification of potential errors or mismatches within the model that may need to be addressed or refined. Table 1 presents key indicators that facilitate the interpretation of how well the model meets established standards and provides guidance for any necessary adjustments or improvement.

Table 1 displays the model fit indices derived from the Structural Equation Modeling (SEM) analysis. It outlines various Goodness of Fit indicators along with their cut-off thresholds, result interpretations, and model assessments. The first index, Chi-square (χ^2), yielded a value of 187.199, which suggests a marginal fit, as a lower value is typically preferred. The associated probability is 0.046, slightly below the recommended threshold of 0.05, reinforcing the marginal fit interpretation. Additional indices evaluated include CMIN/DF, RMSEA, GFI, AGFI, TLI, and CFI. Specifically, CMIN/DF was recorded at 1.977, RMSEA at 0.057, GFI at 0.818, AGFI at 0.787, TLI at 0.851, and CFI at 0.866. These values generally fall within acceptable ranges, indicating that the model achieves a satisfactory level of fit, with some metrics showing marginal fit and others indicating a strong fit.

Referring to the data in Table 1, it can be concluded that the model meets the necessary Goodness of Fit standards, confirming its acceptability for further analysis. Accordingly, this model is deemed suitable for continued use in hypothesis testing. The results of the regression analysis are subsequently presented in Table 2.

The analysis reveals that seven key internal factors demographics, human resources, culture, business management, marketing, Innovation Capability, and Employee Awareness play a crucial role in empowering SMEs for effective environmental management in Aceh Tamiang.

Firstly, demographics encompass elements like age, education, and income, with a score of 0.897, underscoring its significant influence. These demographic factors indicate that the background and capabilities of business owners and employees are essential in supporting environmentally sustainable practices. Higher educational levels and income often correlate with a better understanding and acceptance of eco-friendly business management practices, highlighting the need for continuous education and skill-building in these areas.

Secondly, human resources, which refer to both business owners and employees, scored 0.809, emphasizing their strong impact on the SMEs' environmental management efforts. This factor underscores the importance of having skilled and knowledgeable personnel who can adopt and implement environmentally friendly practices effectively. When human resources are equipped with the necessary skills and knowledge, they can better align with the environmental objectives and standards, such as ISO 14001.

Table 1. Model Fit Indices for SEM

No	Goodness of Fit Index	Cut-off Value	Results Analysis	Evaluation Model
1	χ^2 - Chi- square	Expected to be small	187,199	Marginal fit
2	probability	≥ 0.05 or not equal to zero	0,046	Marginal fit
3	CMIN / DF	<2,00	1,977	Fit
4	RMSEA	≤ 0.08	0,057	Fit
5	GFI	≥ 0.80	0,818	Fit
6	AGFI	≥ 0.70	0,787	Fit
7	TLI	≥ 0.80	0,851	Fit
8	CFI	≥ 0.80	0,866	Fit

Table 2. Results of SEM Analysis on Internal Environmental Factors Affecting Environment-Based MSME Empowerment

Latent Variable	Observed Variable	Standardized Estimate (Est.)	Threshold	Result
Internal Environment	Demographics → Empowerment of SMEs based Environmental Management	0.897	> 0.30	Significant
	Human Resources → Empowerment of SMEs based Environmental Management	0.809	> 0.30	Significant
	Corporate Culture → Empowerment of SMEs based Environmental Management	0.603	> 0.30	Significant
	Management Practices → Empowerment of SMEs based Environmental Management	0.711	> 0.30	Significant
	Marketing → Empowerment of SMEs based Environmental Management	0.614	> 0.30	Significant
	Innovation Capability → Empowerment of SMEs based Environmental Management	0.752	> 0.30	Significant
	Employee Awareness → Empowerment of SMEs based Environmental Management	0.685	> 0.30	Significant

Thirdly, culture within SMEs scored 0.603, proving significant in fostering environmental awareness and sustainable practices. A positive and environmentally conscious organizational culture encourages employees to engage actively in environmental management efforts, thus supporting the empowerment process. Cultural factors reflect the values and attitudes of the organization toward environmental sustainability, where a strong culture of environmental responsibility can drive continuous improvement in green practices.

The fourth factor, business management, scored 0.711 and is essential in structuring and directing SMEs' operations towards sustainability. Effective business management provides a strategic framework for implementing environmental policies and procedures, ensuring that environmental goals are integrated into daily operations. Good management practices enable SMEs to optimize resources, reduce waste, and enhance overall environmental performance.

The fifth factor, marketing scored 0.614, indicates its role in promoting environmentally friendly products and services. Through targeted marketing, SMEs can attract customers who value sustainability, thereby increasing demand for eco-friendly products. Marketing strategies that emphasize environmental benefits can enhance the reputation of SMEs, encourage customer loyalty and support broader community acceptance of sustainable practices.

The sixth factor, innovation capability, registered a standardized estimate of 0.752, demonstrating a strong influence. The ability to innovate allows SMEs to develop cleaner technologies, improve production processes, and design sustainable solutions that reduce environmental impact. Innovation serves as a key driver for adaptation, competitiveness, and long-term ecological resilience.

Finally, the seventh factor, employee awareness, scored 0.685, highlighting the critical role of individual understanding and concern for environmental issues. When employees are environmentally conscious, they are more likely to support and actively participate in the company's sustainability initiatives. Raising environmental awareness through internal training and engagement programs is essential to building a green workplace culture.

Together, these seven internal environmental factors, including demographics, human resources, corporate culture, management practices, marketing, innovation capability, and employee awareness, play a vital role in supporting the success of environmental management empowerment in SMEs. Their synergy forms a strong foundation for sustainable business practices by shaping attitudes and actions toward eco-friendly initiatives. Strengthening these aspects can significantly enhance the resilience and environmental responsibility of MSMEs in Aceh Tamiang. With improved internal capacity, these enterprises are better positioned to meet

sustainability standards while increasing their competitiveness. This approach also provides an opportunity for MSMEs to actively contribute to long-term regional development by aligning economic goals with environmental stewardship.

4. CONCLUSIONS

This study highlights that the empowerment of MSMEs in adopting environmentally sustainable practices is strongly influenced by internal factors such as demographic characteristics, human resource quality, organizational culture, managerial practices, innovation capability, marketing strategies, and employee environmental awareness. These interconnected factors shape the readiness of MSMEs to implement effective environmental management and contribute meaningfully to sustainable development. When these internal dimensions are properly strengthened, MSMEs can play a significant role not only in reducing environmental impacts but also in enhancing their competitiveness and economic value within the local community. Nevertheless, challenges remain in ensuring that all MSMEs have the necessary capacity and access to resources to improve these internal elements. This underscores the need for comprehensive policy support that addresses capacity-building through education, technical training, and context-specific mentoring. Furthermore, future research should explore the dynamic interplay between internal and external factors, providing deeper insights into how these elements can be strategically aligned to drive the transformation of MSMEs toward fully sustainable and resilient business models in the face of environmental and socio-economic changes.

REFERENCES

- Badan Pusat Statistik. (2017). Berita resmi statistik UKM. Retrieved September 13, 2017, from <http://www.scribd.com/doc/16888581/Berita-Resmi-Statistik-Ukm>
- Lahallo, W., Tanjung, R. H. R., Suharno, S., & Sujarta, P. (2022). Diversity, composition and important tree species for Cenderawasih bird activities in Rheapang Muaf ecotourism forest, Jayapura, Papua, Indonesia. *Biodiversitas: Journal of Biological Diversity*, 23(2). <https://doi.org/10.13057/biodiv/d230219>
- Rifanjani, S., Listiani, K. A., Muflihati, M., Perdana, D. M., & Marwanto, M. (2024). White-water rafting tourism potential at Bukit Baka Bukit Raya National Park based on the tourism suitability index. *Media Konservasi*, 28(3), 284–291. <https://doi.org/10.29244/medkon.28.3.284-291>
- Wagner, M. (2015). The link of environmental and economic performance: Drivers and limitations of sustainability integration. *Journal of Business Research*, 68(6), 1306–1317. <https://doi.org/10.1016/j.jbusres.2015.01.012>
- Bank Indonesia. (2017). Website. Retrieved September 18, 2017, from <http://www.bi.go.id>
- Yong, J. Y., Klemeš, J. J., Varbanov, P. S., & Huisinigh, D. (2016). Cleaner energy for cleaner production: Modelling,

Syntia, R., dan Isra, M. (2025). Analyzing the Impact of Internal Factors on MSME Environmental Management for Sustainable Development in Aceh Tamiang Regency, *Jurnal Ilmu Lingkungan*, 23(4), 1107-1113, doi:10.14710/jil.23.4.1107-1113

- simulation, optimisation and waste management. *Journal of Cleaner Production*, 111, 1-16. <https://doi.org/10.1016/j.jclepro.2015.01.001>
- Hariyanto, P. (2017). Bea Cukai dorong pertumbuhan IKM di Aceh. Retrieved from <https://ekbis.sindonews.com/read/1201759/34/b/ea-cukai-dorong-pertumbuhan-ikm-di-aceh-1493707477>
- Lestari, F., Tua, I. N., Muzanni, A., Nugroho, D. F., Wibowo, A. A., Wartono, T., Widanarko, B., Saepullah, A., Modjo, R., & Farida, M. (2023). NDVI, suitability, and carrying capacity of Dieng Plateau forests to sustain Dieng Kulon Village tourism, Central Java, Indonesia. *Biodiversitas*, 24(1), 282-289. <https://doi.org/10.13057/biodiv/d240134>
- Disperindag Aceh Tamiang. (2017). Data pelaku UMKM di Aceh Tamiang
- Mukim, M. (2015). Coagglomeration of formal and informal industry: Evidence from India. *Journal of Economic Geography*, 15(2), 329-351. <https://doi.org/10.1093/jeg/lbu020>
- Ahluwalia, J., & Patel, U. (2018). Solid waste management in India: An assessment of resource recovery and environmental impact.
- Endrikat, J., Guenther, E., & Hoppe, H. (2014). Making sense of conflicting empirical findings: A meta-analytic review of the relationship between corporate environmental and financial performance. *European Management Journal*, 32(5), 735-751. <https://doi.org/10.1016/j.emj.2014.01.001>
- Feng, T., & Wang, D. (2016). The influence of environmental management systems on financial performance: A moderated-mediation analysis. *Journal of Business Ethics*, 135(2), 265-278. <https://doi.org/10.1007/s10551-014-2460-0>
- Wunder, S. (2015). Revisiting the concept of payments for environmental services. *Ecological Economics*, 117, 234-243. <https://doi.org/10.1016/j.ecolecon.2015.06.014>
- Tang, K., Lai, K. H., & Cheng, T. C. E. (2012). Environmental governance of enterprises and their economic upshot through corporate reputation and customer satisfaction. *Business Strategy and the Environment*, 21(6), 401-411. <https://doi.org/10.1002/bse.740>
- Ortas, E., Moneva, J. M., & Álvarez, I. (2014). Sustainable supply chain and company performance: A global examination. *Supply Chain Management: An International Journal*.
- Gotschol, P., De Giovanni, P., & Vinzi, V. E. (2014). Is environmental management an economically sustainable business? *Journal of Environmental Management*, 144, 73-82. <https://doi.org/10.1016/j.jenvman.2014.05.014>