INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

Enhancing Sustainable MSMEs in Karangpring Village through Developing a Green Accounting-based Village Product Bank Model

Siska Aprilia Oktaviani[*, 1], Prillinaya Yudhistira[2], Candra Pramula Pinandita[3], Dwi Indriani Fidiastutik[4], Ponti Primastuti Aulia Nugraheni[5]

[1, 2, 3, 4, 5] *Business Department*

Politeknik Negeri Jember, Indonesia

**Corresponding email: siska_aprilia@polije.ac.id*

Abstract

Sustainable development requires a balance between economic, social, and environmental dimensions. Green accounting emerges as an approach that internalizes environmental impacts into economic practices. However, its implementation has largely been explored at the corporate level, while studies at the village and MSME institutional scale remain limited. This study focuses on Karangpring Village, Jember, which hosts three key MSME sectors (batik, rose farming, and coffee) but faces challenges such as limited capital, weak marketing capacity, and restricted market access. This research proposes a village product bank model based on green accounting as a collective institution that integrates production management, marketing, and environmentally conscious financial recording, to address these issues. A descriptive qualitative approach is employed to explore socio-economic dynamics and the feasibility of green accounting adoption in MSMEs at the village level. The novelty of this research lies in: (1) developing a model for integrating green accounting within village-scale institutions; (2) formulating green accounting indicators tailored for MSMEs; and (3) fostering a collaborative ecosystem among MSME sectors that opens opportunities for linkage with green financing schemes. The proposed model is expected to serve as replicable framework for other villages in strengthening inclusive and sustainable local economic governance.

Keywords: *Green Accounting, Sustainability, Sustainable MSME, Village, Product Bank Model*

|| *Received: 05/12/2025* || *Accepted: 20/04/2026* || *Published: 29/04/2026*

INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia



IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

1. Introduction

Sustainable development has become a cornerstone of global discourse, emphasizing the imperative to harmonize economic growth with social equity and environmental stewardship. This paradigm seeks to ensure that progress in one dimension does not come at the expense of the others, at its core, fostering long-term resilience for communities and ecosystems alike (Basheer et al., 2022; D'Adamo et al., 2023). Green accounting emerges as a pivotal tool, in this context, enabling the integration of environmental costs and benefits into traditional economic frameworks. Green accounting transforms conventional financial reporting into a more holistic measure of sustainability, by internalizing externalities such as resource depletion and pollution, guiding decision making toward regenerative practice (González & Peña-Vinces, 2022; Rounaghi, 2019). However, while its application has been extensively documented in large corporations and national economies, the adoption of green accounting at the grassroots level, particularly in rural villages and among micro, small, and medium enterprises (MSMEs), remains underexplored (Dhar et al., 2021). This gap is particularly pronounced in developing regions, where localized economic activities often bear the brunt of environmental degradation without adequate mechanisms for accountability or support.

In Indonesia, a nation rich in biodiversity yet grappling with rapid urbanization and resource strain, rural MSMEs play a vital role in sustaining local livelihoods and cultural heritage. Consider Karangpring Village in Jember Regency, East Java, a microcosm of these dynamics. Home to thriving sectors such as batik production, rose farming, and coffee cultivation, the village exemplifies the potential of community driven economies. However, these MSMEs confront persistent hurdles, such as constrained access to capital, underdeveloped marketing strategies, and limited penetration into broader markets. These challenges not only stifle growth but also exacerbate environmental pressures, as fragmented operations lead to inefficient resource use and unchecked waste generation. Without institutional innovations that bridge these gaps, the village's economic vitality risks undermining its ecological and social fabric, perpetuating cycles of vulnerability in an era of climate uncertainty (Santika et al., 2019; Žurovec et al., 2017).

This study proposes an innovative village product bank model grounded in green accounting principles to address these intertwined issues. This model consolidates production oversight, marketing efforts, and financial recording with an explicit focus on environmental sustainability, envisioned as a collective institution. The bank would facilitate shared infrastructure, streamlined supply chains, and eco-friendly practices, by pooling resources from diverse MSME sectors, while embedding green metrics such as carbon footprint tracking and natural capital valuation, into everyday operations.

INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

2. Literature review

2.1. Sustainable Development and The Foundations of Green Accounting

Sustainable development, as conceptualized in the Brundtland Report (WCED, 1987), underscores the need for economic progress that meets present needs without compromising future generations' ability to fulfill theirs, integrating economic, social, and environmental pillars (Wu et al., 2024). This tripartite framework has evolved through frameworks like the United Nations Sustainable Development Goals (SDGs), particularly SDG 8 (decent work and economic growth) and SDG 12 (responsible consumption and production), which emphasize inclusive and resource efficient economies. Achieving this balance requires tools that transcend traditional economic metrics, such as GDP, which often overlook ecological costs, in practice. Green accounting is incorporating environmental externalities, such as natural resource depletion, pollution, and biodiversity loss, into financial statements (Rounaghi, 2019). Through methods like environmental cost accounting and natural capital valuation, it enables stakeholders to quantify sustainability impacts, fostering decisions that align profitability with planetary boundaries (Dhar et al., 2021; Rounaghi, 2019). Empirical studies, including those by the World Bank (2018), demonstrate that green accounting enhances corporate resilience by reducing hidden costs and unlocking incentives for eco innovation, yet its theoretical foundations remain rooted in neoclassical economics, prompting critiques for insufficient attention to socio cultural contexts in developing economies (Rounaghi, 2019; Sundarasen et al., 2024).

2.2. Green Accounting Implementation at the Micro Level

The implementation of green accounting has predominantly been examined at macro and corporate scales, with limited exploration at the micro level, particularly among micro, small, and medium enterprises (MSMEs) and rural institutions. Corporate case studies, such as those in the European Union's eco management and audit scheme (EMAS), illustrate how green accounting integrates life cycle assessments and carbon pricing to improve supply chain sustainability (Indriastuti & Mutamimah, 2023). However, MSMEs which constitute over 90% of businesses in developing countries and contribute significantly to employment (ILO, 2020), face unique barriers to adoption, including resource constraints, lack of technical expertise, and regulatory gaps. While simplified green accounting tools, such as input output models for waste tracking, can be adapted for small firms, uptake remains low due to perceived complexity and short-term financial pressures (Lutfi et al., 2023). MSMEs, in rural settings, often rely on natural resources, studies like those in India and Vietnam reveal that environmental accounting can mitigate overexploitation, but institutional voids, such as fragmented governance, hinder scalability (Indriastuti & Mutamimah, 2023; Latifah & Soewarno, 2023). This

DOI: https://doi.org/10.25047/ijossh.v3i1.6653
IJOSSH is published by
Politeknik Negeri Jember, Indonesia
IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

underscores a critical gap, which is the scarcity of village level applications, where community embedded economies demand context specific adaptations beyond corporate paradigms (Sari, 2025).

2.3. Institutional Models for Rural MSME Empowerment

Institutional models for rural MSMEs, particularly product banks or collective repositories, have gained traction as mechanisms for aggregation and value enhancement (Utama et al., 2023). Originating from agricultural cooperatives in Latin America (Fair Trade networks), these models centralize storage, quality control, and distribution to overcome individual limitations (Purnomo & Purwandari, 2025). Green accounting's role in these models is underexplored, pilot studies in Thailand's community enterprises demonstrate that embedding eco ledgers enhances transparency and eligibility for sustainable loans, yet adaptations for multi sector villages like Karangpring, spanning crafts and agriculture, are absent (Lestari et al., 2025; Rounaghi, 2019). This points to a need for hybrid frameworks that tailor green indicators, such as specific metrics for water usage in farming or emissions in processing, to MSME realities (Ronaldo & Suryanto, 2022).

2.4. Integrating Green Accounting with Collaboration and Green Financing

The linkage between green accounting, MSME collaboration, and financing schemes represents an emerging frontier in sustainable rural development. Collaborative ecosystems, as theorized by Porter and Kramer (2011) in shared value creation, promote synergies among sectors, amplifying impacts through networks that connect producers to eco conscious markets (Wang et al., 2022). Such ecosystems facilitate green financing, in MSME contexts, such as loans tied to environmental performance, from institutions like Indonesia's OJK regulated green bonds or international funds (M. M. et al., 2022; Sumastuti et al., 2024). Green accounting certifications boost access to these schemes by providing verifiable data on sustainability, with case studies from Kenyan coffee cooperatives showing a 20% increase in funding inflows (Pope et al., 2017). However, in Indonesian villages, barriers like data asymmetry and institutional trust persist, limiting MSME participation (Basheer et al., 2022). Tailored indicators for green accounting, such as simplified environmental profit and loss statements, could bridge this, yet empirical models integrating them into village product banks are scarce, highlighting the innovation potential for fostering inclusive governance (Gulzar et al., 2024; Sharma & Gandhi, 2023).

INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

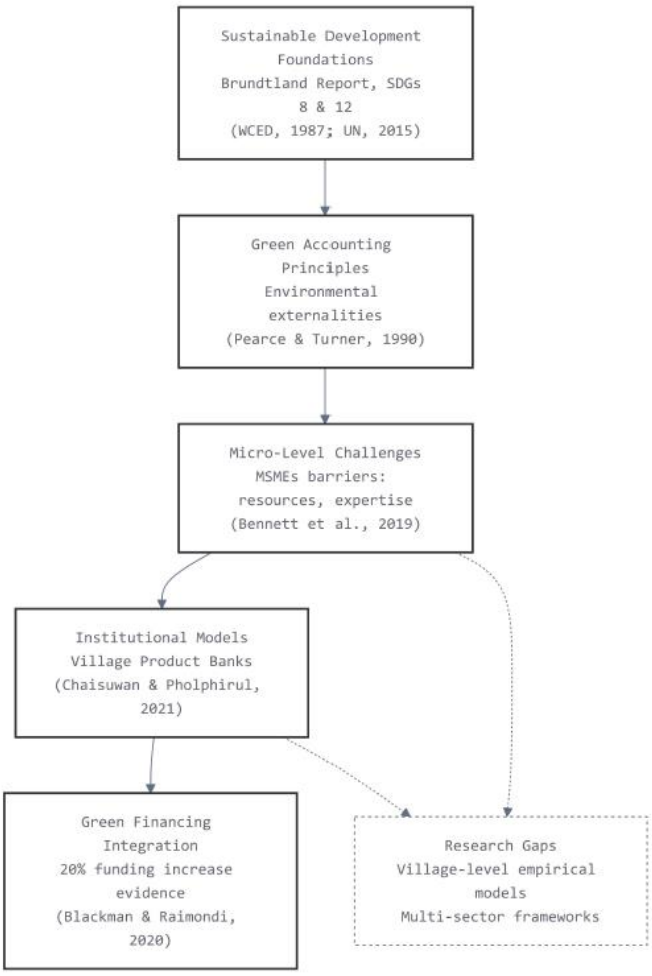


***Figure 1**. The Integration of Village Product Bank and Green Accounting Framework*

3. Method

This study adopted a descriptive qualitative research design, which is particularly suited to exploring complex socio-economic dynamics and the contextual feasibility of innovative models like the village product bank integrated with green accounting. Qualitative approaches allow for in depth understanding of lived experiences, institutional challenges, and adaptive strategies among rural MSMEs, without the constraints of quantitative metrics that may overlook nuanced cultural and environmental factors (Creswell & Poth, 2016). By focusing on Karangpring Village in Jember Regency, East Java, a site emblematic of multi sector MSME operations in batik production, rose farming, and coffee cultivation, the research aims to capture real world applicability in a developing rural context. This design facilitates the triangulation of perspectives from

INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

diverse stakeholders, enabling the identification of barriers, enablers, and potential adaptations for green accounting at the grassroots level. The methodology emphasizes interpretivism, where researchers interpret meanings derived from participants' narratives to construct a replicable framework for sustainable local governance.

Data collection primarily involved semi structured in depth interviews, participant observation, and document analysis, conducted over a six months period to ensure comprehensive coverage of seasonal economic activities. A total of 16 key informants were selected through purposive sampling to include representatives from each MSME sector, village officials, and village facilitators. The informant profile is as follows:

1. One batik production coordinator (Bu Ferty);
2. One rose product coordinator (Bu Yuli);
3. One MSME sales coordinator overseeing batik, rose, and coffee products (Bu Lita);
4. Three members of the coffee production unit (Bu Kartini, Bu Elik, and Bu Ika);
5. Two members of the rose product processing unit (Bu Musyrifah and Bu Rika);
6. Five rose farmers (Pak Yanto, Pak Hari, and Pak Karsiman);
7. The Village Head of Karangpring (Ahmad Sahri); and
8. Two village facilitators (Pak Roni and Pak Erwin).

This purposive composition ensures representativeness across production, marketing, governance, and field-level perspectives, while snowballing techniques were employed to uncover hidden linkages among stakeholders. Field observations complemented the interviews by documenting daily operations in MSME clusters, waste management routines, and resource-sharing dynamics, using field notes and photographs to contextualize verbal data.

Data analysis employed thematic analysis, following Braun and Clarke's (2006) six step process: familiarization with data, initial code generation, theme searching, review, definition, and reporting. SWOT framework was integrated to assess the proposed model's viability, drawing on interview and observation data to evaluate socio economic and environmental dimensions (Lami & Mecca, 2020). This iterative process ensured reflexivity, with the researcher maintaining a journal to mitigate biases and cross verify findings through member checking, sharing preliminary themes with participants for validation (Caretta, 2016).

INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

4. Findings and discussion

4.1 Research Findings

The research findings are derived from in depth interviews, field observations, and stakeholder analyses conducted in Karangpring Village, Jember Regency. These findings focus on the socio-economic and environmental dynamics of local micro, small, and medium enterprises (MSMEs) in batik production, rose farming, and coffee cultivation. The findings are organized into three key components, which are a SWOT analysis of the MSME ecosystem, the formulation of green accounting indicators tailored to the village product bank, and the proposed integrated model for green accounting within the bank. These elements highlight the village's potential for sustainable development while addressing practical challenges.

SWOT Analysis of MSMEs in Karangpring Village

The village demonstrates strong product diversification across its three primary MSME sectors, which are batik, rose flowers, and coffee, each generating a variety of derivative products. Rose farming serves as the economic backbone, yielding processed goods such as scattered rose petals, rose soap, perfume, rose syrup, rose jam, rose petal and bud tea, diffusers, and rose nastar pastries. Interviews and observations also revealed that the MSME can use the concept of eco-symbiosis, where symbiotic collaborations among the MSMEs are feasible, where batik production waste is repurposed as fertilizer for coffee plants, coffee pulp is processed into compost for rose cultivation, and rose extracts are used as natural dyes for batik. Technical support from extention officers at the Horticulture and Food Crops Service further bolsters production capacity building.

Interviews and observations identified several critical internal challenges hindering MSME optimization. Limited access to capital and financing restricts technology adoption and business expansion. Production technicalities pose issues, particularly in achieving precise ingredient compositions for rose based products and the lack of advanced processing equipment, which limits the value addition. Production capacity is constrained, especially in batik products, where manual techniques with basic tools prevent scaling to larger commercial levels. Waste management remains unsystematic, leading to unproductive disposal of resources like rose stems, which actually could serve as rose cuttings for propagation. Marketing limitations result in low product visibility and difficulty competing in broader markets, with production often order based and small scale.

External opportunities for sustainable MSME growth are substantial (M. M. et al., 2022; Sumastuti et al., 2024). Waste utilization shows promising prospects, such as developing rose stems into cuttings and using coffee cascara (husk) for compost or even lulur (traditional scrub) products. These align with potential access to green financing,

INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

environmentally friendly funding tied to sustainability aspects via green accounting systems (Brooks & Schopohl, 2020). The village product bank, when integrated with digital platform offers expansion into national markets. Participation in exhibitions can be leveraged to build strategic networks with cafes, shops, and restaurants for more effective distribution channels.

Key external threats include intensifying market competition from similar products in other regions, seasonal dependency, with peak demand only during Eid al-Fitr, and environmental impacts from chemical use in batik production. Long term production sustainability is at risk without proper management to maintain quality and quantity.

Formulation of Green Accounting Indicators

The development of a green accounting system for the village product bank has yielded seven comprehensive, measurable indicators to support MSME sustainability (Rounaghi, 2019). These indicators are designed to be practical, sector specific, and aligned with the village's multi sector context, focusing on resource efficiency, environmental impacts, and socio-economic benefits. The table below summarizes them:

***Table 1**. Green Accounting Indicators*

No	Type of Indicator	Description
	Resource use efficiency indicator	Implemented through measurement of water usage ratio per unit product, energy consumption per unit production, and raw material utilization rate with a zero waste approach (Rounaghi, 2019).
	Waste management and recycling indicator	Measures the percentage of recycled waste from total production waste, the number of derivative products generated from waste, and the reduction in waste volume disposed into the environment (Antonopoulos et al., 2021; Rounaghi, 2019).
	Environmental cost indicator	Measures waste processing costs per unit product, investment in eco-friendly technology relative to total assets, and costs for preventing environmental impacts in operations (Chen et al., 2021).
	Green Footprint and Emissions Indicator	Measures CO2 emissions per unit product, use of hazardous chemicals in production, and adoption rate of green technologies, particularly relevant for addressing chemical use in production processes (Zheng et al., 2023).
	Green Economic Value Indicator	Measures revenue from eco-friendly products relative to total revenue, return on investment

INTERNATIONAL JOURNAL OF
STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

		(ROI) from green technology investments, and value addition from waste utilization (Elgarahy et al., 2023).
	Social and Community Performance Indicator	Measures the number of workers involved in green programs, MSME participation in eco-symbiosis initiatives, and improvements in MSME actor's capacities, supporting community empowerment (Dushkova & Ivlieva, 2024).
	Transparency and Sustainability Reporting Indicator	Measures the completeness of sustainability reports, frequency of environmental performance reporting, and level of environmental information disclosure to stakeholders (Homayoun et al., 2023).

These indicators provide a balanced framework for tracking environmental, economic, and social dimensions, enabling MSMEs to internalize externalities and demonstrate sustainability for financing purposes (Rounaghi, 2019).

Integrated Model for Green Accounting in the Village Product Bank

Drawing upon the outcomes of the SWOT analysis and the formulation of green accounting indicators, the researcher then developed an integrated model that combines the village product bank with green accounting, as presented in the following figure:

INTERNATIONAL JOURNAL OF STUDIES IN SOCIAL SCIENCES AND HUMANITIES
IJOSSH, Vol 3(1) 2026
DOI: https://doi.org/10.25047/ijossh.v3i1.6653

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons Attribution-ShareAlike 4.0 International License.

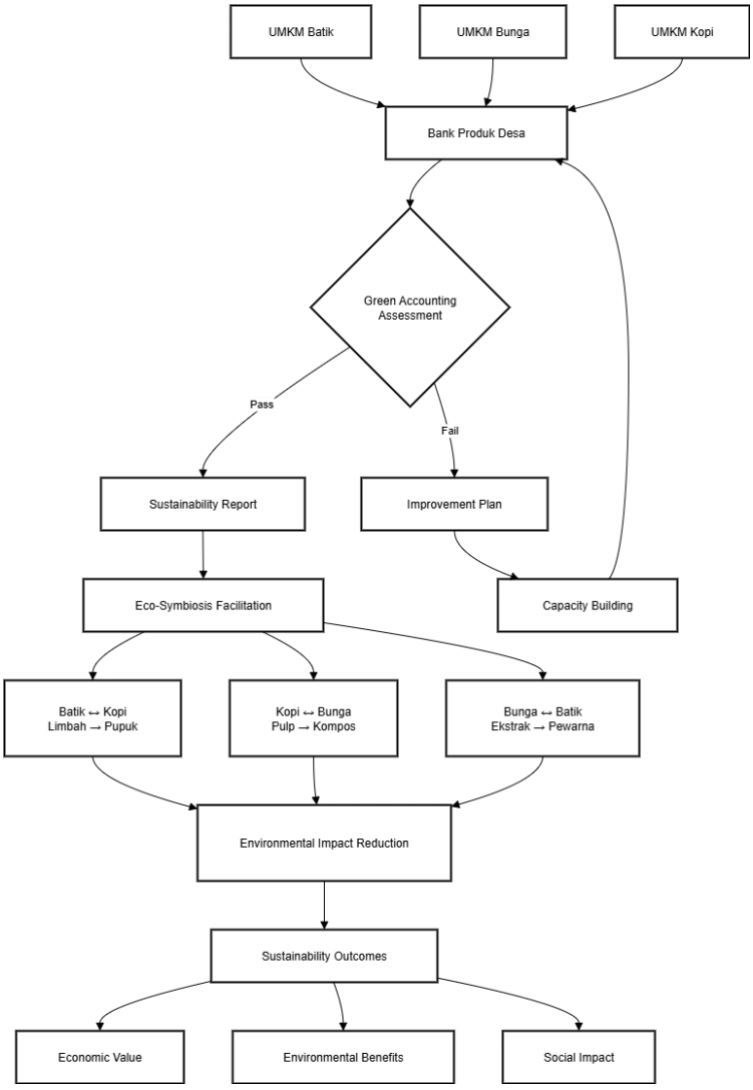


***Figure 2**. The Integration Model of Village Product Bank and Green Accounting for Karangpring Village*

Based on the research findings, the model demonstrates how Village Product Bank can be effectively combined with Green Accounting to create a sustainable village economy ecosystem. This model presents a systematic approach to transforming traditional MSME operations into environmentally conscious and economically viable enterprises through structured assessment and symbiotic relationships. The architectural foundation of this integration model consists of three interconnected layers that work in harmony to achieve sustainability outcomes. At the input level, three sector industries, Rose Flower MSMEs representing agricultural sectors, and Coffee MSMEs representing plantation activities. These sectors were chosen not merely for their economic

DOI: https://doi.org/10.25047/ijossh.v3i1.6653
IJOSSH is published by
Politeknik Negeri Jember, Indonesia
IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

significance, but specifically for their potential to create synergistic relationships that could minimize waste and optimize resource utilization. The Village Product Bank serves as the central consolidation hub, functioning as both an aggregation platform and quality control mechanism that standardizes products before they undergo sustainability assessment.

The Green Accounting Assessment emerges as the critical evaluation mechanism that determines the sustainability trajectory of each MSMEs products and processes (M. M. et al., 2022; Sari, 2025). This assessment framework evaluates multiple dimensions including environmental impact, resource efficiency, carbon footprint, and implementation of sustainable practices. What makes this assessment particularly innovative is its dual pathway outcome system which can select the products meeting sustainability standards should be proceed directly to Sustainability Report generation, while those falling short are redirected through an Improvement Plan coupled with Capacity Building initiatives. This mechanism ensures that no MSME is excluded from the system but rather guided toward sustainable practices through structured support (Arushanyan et al., 2017; Pope et al., 2017; Sharma & Gandhi, 2023).

Building upon the assessment outcomes, the model introduces the groundbreaking concept of Eco symbiosis facilitation, which transforms traditional linear production processes into circular, interconnected systems. This facilitation creates three distinct symbiotic relationships that demonstrate practical circular economy implementation. The Batik and Coffee symbiosis utilizes coffee waste as natural dye for batik production while converting batik washing water into organic fertilizer for coffee cultivation. The Coffee and Rose Flower symbiosis transforms coffee pulp into nutrient rich compost for flower cultivation while employing flowers as natural pest control agents for coffee plantations. The Rose Flower and Batik Symbiosis complete the cycle by using flower extracts as natural dyes and repurposing residual dye materials as plant nutrients. These symbiotic patterns create a closed loop system that should effectively eliminates waste while maximizing resource efficiency across all participating MSMEs (Widyastuti, 2024).
The environmental benefits generated through this symbiotic system should be both measurable and significant, representing a fundamental shift from traditional waste management to resource optimization (Montecalvo et al., 2018). The integrated monitoring system embedded within the Green Accounting Assessment enables real time tracking of environmental impact reduction, allowing each MSME to quantify its contribution to sustainability goals. This measurability is crucial for maintaining accountability and demonstrating the model's effectiveness in achieving environmental conservation objectives while supporting economic growth (Pope et al., 2017).

The comprehensive sustainability outcomes achieved through this integration model align perfectly with the Triple Bottom Line framework, demonstrating simultaneous benefits across economic, environmental, and social dimensions (Janjua et

DOI: https://doi.org/10.25047/ijossh.v3i1.6653
IJOSSH is published by
Politeknik Negeri Jember, Indonesia
IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

al., 2020). Economically, the model generates increased revenue streams through product diversification and cost reduction via efficient resource utilization of what would otherwise be waste materials. Environmentally, the system achieves substantial waste reduction, promotes natural resource conservation, and maintains local biodiversity through emphasis on natural production processes. Socially, the model strengthens community cohesion through collaborative production systems, facilitates knowledge transfer among MSME operators, and enhances local economic resilience by reducing dependence on external resources.

4.2 Discussion

The findings from this study illuminate the transformative potential of integrating green accounting into village level institutions like the proposed model integration of village product bank with green accounting, which is aligning closely with the sustainable development principles outlined in the Brundtland Report (WCED, 1987) and the UN SDGs, particularly SDG 8 and SDG 12. The SWOT analysis reveals a resilient yet vulnerable MSME ecosystem, where internal strengths such as product diversification and emerging eco-symbiosis practices, echoing symbiotic models in agricultural cooperatives, offer a foundation for regenerative economies (Morales et al., 2019). For instance, repurposing batik waste as coffee fertilizer and rose extracts as natural dyes not only minimizes waste but also embodies the circular economy concepts critiques in neoclassical green accounting literature. However, persistent weaknesses like capital constraints and unsystematic waste management mirror broader challenges for rural MSMEs in Indonesia, where fragmented operations exacerbate environmental degradation without accountability (Latifah & Soewarno, 2023). These internal hurdles underscore the need for tailored interventions, as corporate scale green accounting tools often prove inaccessible due to resource limitations (Janjua et al., 2020).

Opportunity identified, such as green financing and digital platform expansion, directly address literature gaps in linking MSME collaborations to sustainable funding (Sumastuti et al., 2024). Threats like seasonal demand and chemical pollution in the production process highlight climate vulnerabilities and regulatory gaps in Indonesian rural economies, emphasizing the urgency of proactive strategies to mitigate overexploitation (Xing, 2024).

The seven green accounting indicators represent a novel, simplified adaptation for MSMEs, bridging the micro level implementation void noted in prior studies. These indicators internalize externalities by focusing on measurable aspects like CO2 emissions per unit and ROI from green investments while prioritizing affordability, making them feasible for manual operations (Indriastuti & Mutamimah, 2023; P. M. M & Anisyah, 2024; Widyastuti, 2024). The social indicator, tracking community participation in eco-symbiosis, aligns with the triple bottom line framework, fostering inclusive governance

DOI: https://doi.org/10.25047/ijossh.v3i1.6653
IJOSSH is published by
Politeknik Negeri Jember, Indonesia
IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

and empowering vulnerable groups, such as women in batik and farming (Tambunan & Reza, 2022). Empirical evidence from the World Bank (2018) supports their efficacy in enhancing resilience, as tracking environmental costs could reduce hidden expenses by up to 20% in similar contexts.

The integrated model innovates by embedding these indicators into a systematic dashboard, enabling monitoring and decision-making that transcends ad hoc sustainability efforts (Rounaghi, 2019). The eco-symbiosis mechanism, with waste flow mapping and exchange platforms, operationalizes shared value creation, potentially yielding symbiotic benefits like cost savings and innovation (Vannevel & Goethals, 2020). For non-compliant MSMEs, the improvement plans promote capacity building, addressing adoption barriers like technical expertise (Rounaghi, 2019). This model's replicability across Indonesian villages could scale rural empowerment, contributing to national goals for MSME sustainability. Comparing the Karangpring eco-symbiosis model with analogous initiatives in other developing countries further underscores its distinctive contribution. In Thailand, community enterprise networks have piloted eco-ledger systems within single-commodity clusters, such as rice and rubber, achieving improved access to sustainable loans; however, these models remain sector-specific and do not address the multi-sector waste exchange dynamkcs central to Karangpring's approach (Lestari et al., 2025; Rounaghi, 2019). In India and Vietnam, environmental accounting has been applied in rural settings to mitigate resource overexploitation, yet institutional fragmentation and weak governance structures have constrained scalability beyond individual cooperatives (Indriastuti & Mutamimah, 2023; Latifa & Soewarno, 2023). Similarly, Kenyan coffee cooperatives have demonstrated that green accounting certifications can increase access to green financing by up to 20%, but these initiatives operate within homogeneous value chains and lack the cross-sector symbiotic mechanisms that define the Karangpring model (Pope et al., 2017). In Latin America, Fair Trade-aligned product banks have suceeded in centralizing quality control and distribution for agricultural MSMEs, yet the integration of real-time environmental performance indicators remains absent (Morales et al., 2019). The Karangpring model advances beyond these precedents by embedding multi-sector eco-symbiosis, encompassing batik, rose farming, and coffee, within a unified green accounting dashboard that simultaneously generates sustainability reports and triggers improvement pathways for non-compliant MSMEs. This integrated, village-scale design addresses the institutional voids and sectoral silos that have limited the effectiveness of comparable models elsewhere, positioning it as context-sensitive and transferable framework for inclusive rural economic governance.

DOI: https://doi.org/10.25047/ijossh.v3i1.6653
IJOSSH is published by
Politeknik Negeri Jember, Indonesia
IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

5. Conclusion

The strategic advantages of this integration model extend beyond immediate sustainability benefits to encompass long term scalability and replicability potential. The model's structured quality assurance system ensures consistent sustainability standards while its continuous improvement mechanism provides ongoing support for MSMEs to enhance their practices. The circular economy principles are implemented concretely rather than theoretically, making the model both practical and demonstrable to other communities. Most importantly, the integration of green accounting transforms sustainability assessment from an external audit function to an integral component of daily business operations, ensuring long term commitment to environmental stewardship.

The implications of this research extend far beyond the immediate participating MSMEs to encompass broader strategist for sustainable village economic development in Indonesia and similar developing contexts. The model demonstrates that bottom-up sustainability approaches can effectively bridge the gap between grassroots economic activities and national sustainable development goals. The Village Product Bank functions as a crucial intermediate institution that connects individual MSME capabilities with market demands for sustainable products, while the integrated green accounting system opens pathways to green financing opportunities and premium market access. Moreover, the model successfully integrates local wisdom and traditional practices with modern sustainability frameworks, creating context specific solutions that are both culturally appropriate and environmentally effective.

References

Antonopoulos, I., Faraca, G., & Tonini, D. (2021). Recycling of post-consumer plastic packaging waste in the EU: Recovery rates, material flows, and barriers. *Waste Management (New York, N.y.)*, *126*, 694–705. https://doi.org/10.1016/j.wasman.2021.04.002

Arushanyan, Y., Ekener, E., & Moberg, Å. (2017). Sustainability Assessment Framework for Scenarios - SAFS. *Environmental Impact Assessment Review*, *63*, 23–34. https://doi.org/10.1016/J.EIAR.2016.11.001

Basheer, M., Nechifor, V., Calzadilla, A., Ringler, C., Hulme, D., & Harou, J. (2022). Balancing national economic policy outcomes for sustainable development. *Nature Communications*, *13*. https://doi.org/10.1038/s41467-022-32415-9

Brooks, C., & Schopohl, L. (2020). Green Accounting and Finance: Advancing Research on Environmental Disclosure, Value Impacts and Management Control Systems.

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

CGN: Disclosure & Accounting Decisions (Topic). https://doi.org/10.2139/ssrn.3741193

Caretta, M. (2016). Member checking: A feminist participatory analysis of the use of preliminary results pamphlets in cross-cultural, cross-language research. *Qualitative Research*, *16*, 305–318. https://doi.org/10.1177/1468794115606495

Chen, T. S., Huang, Y. F., Weng, M. W., & Do, M. H. (2021). Two-stage production system pondering upon corporate social responsibility in food supply chain: A case study. *Applied Sciences (Switzerland)*, *11*(3), 1–19. https://doi.org/10.3390/app11031088

D'Adamo, I., Gastaldi, M., Hariram, N., Mekha, K., Suganthan, V., & Sudhakar, K. (2023). Sustainalism: An Integrated Socio-Economic-Environmental Model to Address Sustainable Development and Sustainability. *Sustainability*. https://doi.org/10.3390/su151310682

Dhar, B. K., Sarkar, S. M., & Ayittey, F. (2021). Impact of Social Responsibility Disclosure between Implementation of Green Accounting and Sustainable Development: A Study on Heavily Polluting Companies in Bangladesh. *SRPN: Other Corporate Social Responsibility (CSR) (Topic)*. https://doi.org/10.1002/CSR.2174

Dushkova, D., & Ivlieva, O. (2024). Empowering Communities to Act for a Change: A Review of the Community Empowerment Programs towards Sustainability and Resilience. *Sustainability*. https://doi.org/10.3390/su16198700

Elgarahy, A., Eloffy, M., Alengebawy, A., El-Sherif, D., Gaballah, M., Elwakeel, K., & El-Qelish, M. (2023). Sustainable management of food waste; pre-treatment strategies, techno-economic assessment, bibliometric analysis, and potential utilisations: A systematic review. *Environmental Research*, 115558. https://doi.org/10.1016/j.envres.2023.115558

González, C., & Peña-Vinces, J. (2022). A framework for a green accounting system-exploratory study in a developing country context, Colombia. *Environment, Development and Sustainability*, *25*, 9517–9541. https://doi.org/10.1007/s10668-022-02445-w

Gulzar, R., Bhat, A., Mir, A. A., Athar, S. A., & Al-Adwan, A. (2024). Green banking practices and environmental performance: navigating sustainability in banks. *Environmental Science and Pollution Research International*. https://doi.org/10.1007/s11356-024-32418-7

Homayoun, S., Mashayekhi, B., Jahangard, A., & Samavat, M. (2023). *The Controversial Link between CSR and Financial Performance : The Mediating Role of Green Innovation*.

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

Indriastuti, M., & Mutamimah, M. (2023). Green Accounting and Sustainable Performance of Micro, Small, and Medium Enterprises: The Role of Financial Performance as Mediation. *The Indonesian Journal of Accounting Research*. https://doi.org/10.33312/ijar.691

Janjua, S., Sarker, P., & Biswas, W. (2020). Development of triple bottom line indicators for life cycle sustainability assessment of residential buildings. *Journal of Environmental Management*, *264*, 110476. https://doi.org/10.1016/j.jenvman.2020.110476

Lami, I., & Mecca, B. (2020). Assessing Social Sustainability for Achieving Sustainable Architecture. *Sustainability*. https://doi.org/10.3390/su13010142

Latifah, S. W., & Soewarno, N. (2023). The environmental accounting strategy and waste management to achieve MSME's sustainability performance. *Cogent Business & Management*, *10*. https://doi.org/10.1080/23311975.2023.2176444

Lestari, N. S. A., Viranti, A., Srinu, S., & Pramita, S. (2025). Sustainable Tourism in Jatiluwih Village: Analysis of Green Accounting Implementation in Tourism Destination Operations. *Journal of Entrepreneurial and Business Diversity*. https://doi.org/10.38142/jebd.v3i1.287

Lutfi, A., Alqudah, H., Alrawad, M., Alshira'h, A., Alshirah, M., Almaiah, M. A., Alsyouf, A., & Hassan, M. F. (2023). Green Environmental Management System to Support Environmental Performance: What Factors Influence SMEs to Adopt Green Innovations? *Sustainability*. https://doi.org/10.3390/su151310645

M., M., Aithal, P., & S., S. (2022). Impact of Sustainable Finance on MSMEs and other Companies to Promote Green Growth and Sustainable Development. *International Journal of Applied Engineering and Management Letters*. https://doi.org/10.47992/ijaeml.2581.7000.0120

M, P. M., & Anisyah, N. (2024). MSMEs Upgrade with The Concept of Green Accounting and Digitalization: Study Literature Review. *JIMU:Jurnal Ilmiah Multidisipliner*. https://doi.org/10.70294/jimu.v2i02.361

Montecalvo, M., Farneti, F., & de Villiers, C. (2018). The potential of integrated reporting to enhance sustainability reporting in the public sector. *Public Money and Management*, *38*(5), 365–374. https://doi.org/10.1080/09540962.2018.1477675

Morales, E., Diemer, A., Cervantes, G., & Carrillo-González, G. (2019). "By-product synergy" changes in the industrial symbiosis dynamics at the Altamira-Tampico industrial corridor: 20 Years of industrial ecology in Mexico. *Resources, Conservation and Recycling*. https://doi.org/10.1016/J.RESCONREC.2018.09.026

Pope, J., Bond, A., Hugé, J., & Morrison-Saunders, A. (2017). Reconceptualising sustainability assessment. *Environmental Impact Assessment Review*, *62*, 205–215. https://doi.org/10.1016/J.EIAR.2016.11.002

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

Purnomo, S., & Purwandari, S. (2025). A Comprehensive Micro, Small, and Medium Enterprise Empowerment Model for Developing Sustainable Tourism Villages in Rural Communities: A Perspective. *Sustainability*. https://doi.org/10.3390/su17041368

Ronaldo, R., & Suryanto, T. (2022). Green finance and sustainability development goals in Indonesian Fund Village. *Resources Policy*. https://doi.org/10.1016/j.resourpol.2022.102839

Rounaghi, M. M. (2019). Economic analysis of using green accounting and environmental accounting to identify environmental costs and sustainability indicators. *International Journal of Ethics and Systems*. https://doi.org/10.1108/ijoes-03-2019-0056

Santika, T., Wilson, K., Meijaard, E., Budiharta, S., Law, E., Sabri, M., Struebig, M., Ancrenaz, M., & Poh, T. (2019). Changing landscapes, livelihoods and village welfare in the context of oil palm development. *Land Use Policy*. https://doi.org/10.1016/J.LANDUSEPOL.2019.104073

Sari, G. I. (2025). Implementation of Green Accounting and Environmentally Friendly Work Culture in Increasing the Competitiveness of Local MSMEs. *Riwayat: Educational Journal of History and Humanities*. https://doi.org/10.24815/jr.v8i1.44367

Sharma, A., & Gandhi, A. (2023). Consumer adoption study for innovative technology products and services in an emerging economy. *International Journal of Innovation Science*. https://doi.org/10.1108/ijis-06-2022-0106

Sumastuti, E., Harahap, S., & Sianipar, G. (2024). Exploring The Impact Of Green Finance, Financial Literacy, And Social Capital On The Performance And Financial Sustainability Of Indonesian MSMEs. *Journal of Economic, Business and Accounting (COSTING)*. https://doi.org/10.31539/costing.v7i4.9719

Sundarasen, S., Rajagopalan, U., & Alsmady, A. (2024). Environmental Accounting and Sustainability: A Meta-Synthesis. *Sustainability*. https://doi.org/10.3390/su16219341

Tambunan, D. R., & Reza, H. K. (2022). *Village Community Satisfaction Index with Village Government Services*. *1*(10), 2151–2160.

Utama, S., Yusfiarto, R., Pertiwi, R. R., & Khoirunnisa, A. (2023). Intentional model of MSMEs growth: a tripod-based view and evidence from Indonesia. *Journal of Asia Business Studies*. https://doi.org/10.1108/jabs-08-2022-0291

Vannevel, R., & Goethals, P. (2020). Identifying Ecosystem Key Factors to Support Sustainable Water Management. *Sustainability*. https://doi.org/10.3390/su12031148

IJOSSH is published by
Politeknik Negeri Jember, Indonesia

IJOSSH is licenced under a Creative Commons
Attribution-ShareAlike 4.0 International License.

Wang, K.-H., Zhao, Y.-X., Jiang, C.-F., & Li, Z. (2022). Does green finance inspire sustainable development? Evidence from a global perspective. *Economic Analysis and Policy*. https://doi.org/10.1016/j.eap.2022.06.002

Widyastuti, T. (2024). Exploring the Influence of Green Accounting on Sustainability Performance: A Literature Review. *Greenation International Journal of Economics and Accounting*. https://doi.org/10.38035/gijea.v2i1.166

Wu, W., Shi, J., & Liu, Y. (2024). The impact of corporate social responsibility in technological innovation on sustainable competitive performance. *Humanities and Social Sciences Communications*, *11*(707), 1–13. https://doi.org/10.1057/s41599-024-03193-0

Xing, W. (2024). Sustainable tourism: Pathways to environmental preservation, economic growth, and social equity. *Applied and Computational Engineering*. https://doi.org/10.54254/2755-2721/66/20240943

Zheng, X., Chen, X., Qu, A., Yang, W., Tao, L., Li, F., Huang, J., Xu, X., Tang, J., Hou, P., & Han, W. (2023). Valorisation of food waste for valuable by-products generation with economic assessment. *Journal of Environmental Management*, *338*, 117762. https://doi.org/10.1016/j.jenvman.2023.117762

Žurovec, O., Čadro, S., & Sitaula, B. (2017). Quantitative Assessment of Vulnerability to Climate Change in Rural Municipalities of Bosnia and Herzegovina. *Sustainability*, *9*, 1208. https://doi.org/10.3390/SU9071208