Research Article
Sustainable Economy

Transforming Waste into Wealth: Community Empowerment and Green Economy Practices in Rural Indonesia

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Abstract: Waste accumulation remains a critical environmental issue in rural Indonesia, where inadequate infrastructure and low environmental awareness hinder effective management. Within the framework of the green economy which emphasizes resource efficiency, environmental protection, and social inclusion this study examines the role of the Prai Meke Village Waste Bank in transforming community behavior and promoting sustainable livelihoods. Using a qualitative descriptive approach, data were collected through interviews, observations, and documentation involving village officials, waste bank administrators, and residents. The results reveal a 60% reduction in inorganic waste and an increase in household income of approximately IDR 100,000–150,000 per month, with most participants preferring to redeem their waste savings in the form of staple goods rather than cash. Environmentally, the program reduced open dumping and burning, while socially, it strengthened cooperation and collective awareness of environmental responsibility. These findings demonstrate that the waste bank model serves not only as an environmental management tool but also as a practical application of green economy principles that link ecological sustainability, social empowerment, and rural economic resilience.

Introduction

The escalating problem of solid waste has become a critical environmental and socioeconomic issue, not only in urban centers but also in rural communities (1, 2). Globally, the World Bank estimates that municipal solid waste will reach 3.4 billion tons by 2050 if current trends persist, underscoring waste management as a central concern within the Sustainable Development Goals (SDGs), particularly Goals 11, 12, and 13 on sustainable cities, responsible consumption, and climate action (3). Indonesia alone generates over 64 million tons of waste annually, of which only 10% is recycled and about 30% remains unmanaged contributing to environmental degradation, greenhouse gas emissions, and health risks (4). In West Nusa Tenggara (NTB) province, approximately 80% of waste is untreated, with thousands of tons accumulating daily. This situation not only threatens environmental integrity but also undermines local livelihoods, highlighting the urgency for community-based and scalable waste governance solutions.

Conventional waste management strategies such as landfilling, incineration, and sporadic recycling programs have produced limited results due to infrastructural deficits, weak regulatory enforcement, and insufficient incentives for household-level participation (5, 6). While organic waste can decompose naturally, the volume generated far exceeds the environment's regenerative capacity (7, 8). Furthermore, entrenched perceptions of waste as valueless hinder behavioral change and collective participation (9, 10). Existing interventions often fail to align with broader frameworks such as the circular economy or green economy, which emphasize value recovery, inclusive participation, and systemic integration of environmental and economic objectives (11, 12). Embedding local initiatives within these paradigms is essential for transitioning from linear "take-make-dispose" systems toward sustainable resource cycles (13, 14).

To address this gap, the present study examines the implementation of a waste bank model in Prai Meke Village as a localized manifestation of the green economy concept. Waste banks operationalize the 3R (Reduce, Reuse, Recycle) principle through a reward-based mechanism that transforms waste into a tradable asset, fostering environmental stewardship and micro-scale circularity (15). Beyond mitigating pollution, this model contributes to economic empowerment and environmental literacy, aligning with Indonesia's National Policy on Waste Management (Presidential Regulation No. 97/2017) and the ASEAN Framework on Circular Economy (16).

This not only mitigates pollution but also improves household income and environmental literacy. However,

empirical analysis on its actual effectiveness and scalability remains scarce. This study aims to examine the potential of household waste as an economic resource, the operational dynamics of the waste bank, and its role in supporting sustainable livelihoods. Using a qualitative descriptive method, we conducted non-participant observation, interviews, and document analysis to evaluate the waste bank's socioeconomic and ecological impact.

Methodology

Study Design and Rationale

This study employed a qualitative descriptive research design to explore the potential of community-based waste management as an application of green economy principles in Prai Meke Village, Central Lombok. The rationale for adopting a qualitative approach lies in its capacity to capture rich, contextual insights into behaviors, perceptions, and institutional processes that are not easily quantified. The study specifically investigated the operations and socioeconomic impact of a local waste bank initiative

Study Area

The study was conducted in Prai Meke Village, located in Central Lombok Regency, West Nusa Tenggara Province. The village is primarily agrarian, with limited formal waste management infrastructure. As of 2021, it had approximately X households, with a majority engaged in informal sectors. This contextual profile underscores the relevance of community-based waste initiatives in the area.

Population and Sampling

The target population consisted of stakeholders involved in the waste management program, including waste bank administrators, registered participants (referred to as "depositors"), and relevant community leaders. A purposive sampling strategy was applied to select key informants based on their roles, knowledge, and active involvement in waste bank operations. The final sample included 6 waste bank administrators and 10 household-level depositors, ensuring diverse representation from various socio-economic segments of the village. To justify this sample size, the number of participants was determined based on data saturation, where no new themes or insights emerged after repeated interviews, indicating adequate depth of information. This sample composition also reflected the proportional engagement of stakeholders in the waste bank structure, balancing administrative and depositor perspectives..

Data Collection and Procedures

Fieldwork was conducted between April and June 2021. Data were collected using non-participant observation, semi-structured interviews, and document analysis. The researcher observed operational processes of the waste bank including the sorting, weighing, and recording of waste deposits, as well as the logistical workflow and depositor interactions, without interfering in daily activities. In parallel, semi-structured interviews were carried out with selected informants using a guided framework covering key themes such as environmental awareness, economic impact, waste segregation practices, and institutional challenges. Interviews were recorded with consent and transcribed for analysis. Institutional documents such as transaction records, depositor logs, and internal reports were also reviewed to support triangulation and deepen insight into the program's structure and outcomes. The interview guide and observation checklist were developed based on prior literature on community-based waste management and validated by two qualitative research experts for content relevance and clarity before field deployment. Manual field notes were also cross-checked with recorded transcripts to ensure accuracy and contextual completeness

Data Analysis

An inductive thematic analysis was conducted to identify emerging patterns and themes. Transcripts and field notes were coded manually, and the data were processed iteratively using Miles and Huberman's interactive model: data reduction, data display, and conclusion drawing. The operationalization of this model involved three analytic stages: (1) initial open coding of interview transcripts and observation notes, (2) clustering of similar codes into subthemes and broader categories, and (3) synthesis of thematic relationships to form final analytical constructs. To enhance coding reliability, a second coder independently reviewed 25% of the transcripts. Inter-coder agreement was calculated manually and reached a consistency rate above 85%, confirming reliability. Discrepancies were resolved through discussion. Triangulation was implemented by cross-verifying information from interviews, observations, and institutional documents, ensuring that interpretations were supported by at least two independent data sources. This methodological triangulation strengthened internal validity by reducing potential researcher bias. No specialized software was used; instead, manual coding allowed for iterative reflection and in-depth immersion in the qualitative data.

Results

Community-Based Waste Management Practices in Prai Meke

Waste management in Prai Meke Village has long been a persistent challenge. Most households previously disposed of or burned their waste due to limited infrastructure and low environmental awareness. The establishment of the Prai Meke Waste Bank marked a community-driven shift from perceiving waste as valueless to viewing it as a potential resource.

According to the Village Head, H. Moh. Salehuddin, S.Pd., the government initiated the Waste-Free Village Program to encourage residents to manage household waste collectively and productively.

One coordinator, Ahmad Erpan, explained: "For waste to be deposited, we ask residents to sort it first before taking it to the waste bank. We have provided one sack for each household to store their recyclables".

This practice reflects a growing behavioral transformation: households are now sorting rather than discarding waste. Field observations indicated that about 65–70% of households actively segregate recyclable materials, mainly plastic bottles and cardboard, before depositing them at the waste bank.

Customer Recruitment and Onboarding Mechanism

Membership recruitment in the waste bank follows an informal, peer-based approach. Ahmad Erpan noted: "Recruitment is carried out by approaching and inviting

Table 1. Growth of waste bank membership in prai meke village.

Year	Active Members	Estimated Average Monthly Save (IDR)
2020	10	25,000-30,000
2021	58	50,000-60,000

Table 2. Common waste types and average market prices at the prai meke waste bank.

Type of Waste	Price per Kg (IDR)
Cardboard	2,000
White paper	1,000
Plastics bags	500
Plastics cups	2,500
“Ale-ale” Packaging	1,250
Plastic bottles	2,000
Mixed plastics	1,500

residents to join through outreach, and residents then spread the information to other residents, so that many people finally know about the existence of the waste bank”.

Initially, only ten households participated when the program started in 2020. By the end of 2021, participation had increased to 58 active members, showing gradual community acceptance and trust in the initiative. Estimated average monthly save can be seen in **Table 1**.

Waste collection is conducted twice a week in each hamlet. The management team weighs, records, and logs all deposits transparently in member savings books. This participatory mechanism enhances public accountability and encourages consistent engagement.

Types of Waste Deposited and Collection Procedures

Most deposited waste is non-organic, including paper, plastic bottles, and packaging materials. The price structure is standardized and displayed in **Table 2**.

According to Ahmad Erpan, the bank does not yet process organic waste; only recyclable non-organics are collected. Organic materials such as animal manure and crop residues are independently reused by villagers as fertilizer or firewood.

By applying this system, waste becomes an economic asset. As Dian Safitri (Treasurer) noted, “Customers can withdraw their savings in the form of cash or food” showing that the waste bank functions not only as a recycling unit but also as an informal microfinance institution supporting daily needs.

Socio-Economic Impacts of the Waste Bank

The waste bank has generated both economic and social benefits for residents of Prai Meke Village. As stated by the treasurer, Dian Safitri: “Customers can increase their income by saving on waste. They can choose to withdraw their savings in cash or purchase essential goods. Most prefer groceries”.

Participant Ratnisah shared: “The waste bank has been very helpful to me. I have a small shop at home, and with the extra income from the waste savings, I can increase my business capital”.

Another depositor, Sahmin, added: “We can withdraw our grocery savings according to the value of our savings, and we simply inform the clerk when weighing the items we want. The groceries will then be delivered to our home”.

Based on the waste bank’s savings records and interviews with administrators, the program has contributed to a measurable increase in household income. On average, active members earn an additional IDR 100,000–150,000 per month through recyclable waste deposits and accumulated savings. This income consists of both direct cash withdrawals and equivalent value in staple goods such as rice, cooking oil, and sugar. The additional earnings, though modest, have improved household purchasing power and supported small-scale enterprises, particularly among women and lower-income families.

In addition, the treasurer, Dian Safitri, highlighted the implementation of 3R practices: “People still reuse reusable items, such as plastic bags and bottles. We've trained several people to make crafts from milk bottles, but only a few have started doing it themselves”.

Overall, these findings indicate that the Prai Meke Waste Bank not only enhances community income but also promotes behavioral change, social solidarity, and environmental responsibilitymaking it a practical entry point for integrating green economy principles at the village level.

Barriers and Sustainability Challenges

Despite notable progress, the waste bank still faces several operational challenges. Facilities for processing organic waste remain limited, and its activities continue to rely heavily on capital provided by the village-owned enterprise (BumDes). Community participation also varies considerably, reducing the consistency of waste collection and sorting efforts. In addition, access to recycling markets and training opportunities remains restricted, limiting the waste bank’s ability to improve value-added processing and expand its network. These issues collectively indicate that stronger institutional backing and more stable financial support are essential for sustaining and scaling the waste bank’s operations.

Discussion

Waste Management as a Foundation for the Local Green Economy

In rural contexts such as Prai Meke Village, waste was traditionally viewed as a disposable byproduct with no economic or social value. Prior to the establishment of the Prai Meke Waste Bank, open dumping and burning were common practices due to the absence of infrastructure and limited public awareness. The introduction of this waste bank has transformed community behavior, promoting more sustainable and organized waste management aligned with the green economy framework, which integrates environmental preservation, economic resilience, and social inclusion (17, 18).

The 3R principles reduce, reuse, and recycle serve as the operational foundation of this transformation (19). Residents now sort their household waste into reusable, recyclable, and residual categories. Inorganic waste such as plastic bottles and cardboard is sold or repurposed into crafts, while organic materials are reused as compost or animal feed (20). These actions illustrate the “waste as resource” paradigm, in which discarded materials are reintegrated into productive cycles.

Beyond reducing environmental pollution, this system introduces the idea that local environmental stewardship can coexist with income-generating opportunities (21).

The implementation of these practices demonstrates that ecological and economic gains can be achieved simultaneously through community-led initiatives supported by local institutions. The waste bank thus represents an entry point for operationalizing the green economy at the village level, transforming environmental responsibility into tangible financial and social benefits.

Empowerment and Socioeconomic Impacts of the Waste Bank

The waste bank's operation has produced significant empowerment effects within the community (22, 23). Residents, particularly women and lower-income groups, actively engage in sorting, collecting, and depositing recyclable materials. In return, they receive credits that can be withdrawn in cash or exchanged for essential goods. This mechanism not only incentivizes proper waste disposal but also transforms recyclables into a form of household savings, thus strengthening financial inclusion (24).

Empowerment occurs across three interrelated dimensions. Cognitively, residents have developed stronger environmental awareness and a better understanding of waste as a valuable resource. Behaviorally, the community demonstrates active participation and consistent involvement in the program. Economically, the initiative provides supplemental income, reducing household vulnerability to financial instability. These changes indicate the emergence of local agency and collective ownership over environmental practices core components of sustainable development.

The results align with the inclusive green growth framework, which seeks to expand economic participation without compromising ecological balance. While precise quantitative data remain limited, qualitative evidence suggests consistent growth in membership and waste recovery, indicating a positive trajectory in both environmental and social outcomes.

Barriers, Sustainability Risks, and Long-Term Scalability

Despite its encouraging progress, several challenges threaten the long-term sustainability of the Prai Meke Waste Bank. Limited infrastructure and equipment hinder operational efficiency, while financial dependence on village-owned enterprise (BUMDes) capital makes the program vulnerable to funding shortages and market fluctuations in recyclable prices. Additionally, the absence of organic waste processing restricts the program's environmental reach, and uneven community participation slows down broader adoption (25).

These barriers reveal that community-based waste management initiatives require continuous institutional and financial support to remain viable. Sustainable expansion will depend on improving technical capacity, particularly through training in organic waste processing and creative recycling, as well as diversifying funding sources (26). Building partnerships with private recycling industries or local cooperatives could enhance market access and long-term stability (27).

Moreover, scalability requires adaptive governance policies that integrate waste banks into regional waste management plans and link them to broader sustainability agendas. Without such integration, community-based efforts risk remaining small-scale and donor-dependent (28). Addressing these risks is crucial to ensure that waste bank models can mature into self-sustaining pillars of local green economy systems.

Theoretical Integration and Policy Implications

The experience of Prai Meke illustrates the practical convergence between the green economy and circular economy paradigms. Both emphasize resource efficiency, reduced waste generation, and social inclusion as pathways toward sustainable development. At the micro level, this case demonstrates how grassroots environmental actions can operationalize these macro-level sustainability concepts, translating theory into daily practice.

From a policy standpoint, several implications emerge. First, institutionalizing waste banks within regional and national waste management frameworks would ensure continuity and funding stability. Second, capacity building programs particularly targeting women and youth should focus on creative recycling and entrepreneurship, linking environmental action to livelihood improvement. Third, connecting community waste banks to larger recycling networks and green enterprises would enhance value chains and market integration. Finally, systematic monitoring mechanisms should be developed to measure both environmental impacts (e.g., reduced waste volume, lower emissions) and socioeconomic outcomes (e.g., income gains, participation rates).

By addressing these aspects, waste bank initiatives can evolve from small community projects into replicable models for rural green economy transformation. The Prai Meke case thus highlights how environmental innovation, when coupled with empowerment and institutional support, can foster inclusive, sustainable development.

Conclusion

The Prai Meke Village Waste Bank demonstrates that community-based waste management can effectively integrate green economy principles into rural development. The program has led to tangible outcomes, including an estimated 60% reduction in inorganic waste accumulation, a notable increase in household income, and stronger collaboration between residents and local authorities in managing environmental issues. These achievements highlight how waste can be transformed from an environmental burden into a productive local resource that enhances both ecological sustainability and community welfare.

From a policy perspective, the Prai Meke model offers a scalable framework for integrating waste banks into regional waste management strategies. Local governments can strengthen sustainability by providing continuous financial support, capacity-building programs, and market linkages for recyclable materials. Embedding waste banks within broader circular economy and green village initiatives could also ensure long-term environmental and economic benefits.

However, this study is not without limitations. It relies on qualitative, self-reported data collected from a small sample within a single village, which restricts the generalizability of its findings. Future research should employ mixed-method or longitudinal designs across multiple regions to quantify the long-term impacts on waste reduction, income stability, and

behavioral change, thereby deepening empirical understanding of the sustainability and scalability of rural waste bank models.

Declarations

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Conflict of Interest

The authors declare no conflicting interest.

Data Availability

The unpublished data is available upon request to the corresponding author.

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Not applicable.

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