

From Waste to Wealth: Social Sustainability and Women Empowerment Initiatives in Kampung Jambangan, Surabaya

(Dari Pembaziran ke Kemewahan: Kelestarian Sosial dan Inisiatif Pemerdayaan Wanita di Kampung Jambangan, Surabaya)

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ABSTRACT

Kampung Jambangan in Surabaya, Indonesia stands out as a successful example of a community-driven approach to sustainability, where waste management challenges have been turned into opportunities for social and economic development. This case study explores how the community's initiatives contribute to social empowerment, economic growth, and environmental sustainability, with particular emphasis on the pivotal role of women and their alignment with the United Nations Sustainable Development Goals (UN-SDGs). The study was conducted through field observations, interviews with residents and community leaders, and a review of relevant documentation on Kampung Jambangan's sustainability programmes. The community has embraced practices such as eco-printing, eco-enzyme production, and composting to minimise waste while preserving traditional skills. These efforts led by women have resulted in reduced waste, income generation, and improved agricultural practices. Today, Kampung Jambangan is recognised as a centre for traditional craftsmanship and environmental awareness. Sustaining this progress will require continuous skills development, greater youth engagement, and stronger partnerships.

Keywords- Sustainability, Waste Management, Social Empowerment, Economic Growth

ABSTRAK

Kampung Jambangan di Surabaya, Indonesia, menjadi contoh yang berjaya bagi pendekatan berasaskan komuniti dalam kelestarian, di mana cabaran pengurusan sisa telah diubah menjadi peluang untuk kemajuan sosial dan ekonomi. Kajian kes ini mengkaji bagaimana inisiatif komuniti menyumbang kepada peningkatan sosial, pertumbuhan ekonomi, dan kelestarian alam sekitar; dengan memberi tumpuan khusus kepada peranan penting wanita dalam transformasi ini serta sejauh mana ia selaras dengan Matlamat Pembangunan Lestari (SDGs) Pertubuhan Bangsa-Bangsa Bersatu (PBB). Kajian ini dijalankan melalui pemerhatian lapangan, temuramah dengan penduduk dan pemimpin komuniti, serta kajian terhadap dokumentasi berkaitan program kelestarian Kampung Jambangan. Komuniti ini telah mengamalkan pelbagai amalan seperti pencetakan eko, pengeluaran eko-enzim, dan komposting untuk mengurangkan sisa sambil memelihara kemahiran tradisional. Usaha-usaha ini, yang banyak dipimpin oleh wanita, telah berjaya mengurangkan sisa, menjana pendapatan, dan meningkatkan amalan pertanian. Kini, Kampung Jambangan diiktiraf sebagai pusat kemahiran tradisional dan kesedaran alam sekitar. Untuk memastikan kelangsungan kejayaan ini, pembangunan kemahiran berterusan, penglibatan golongan muda, dan perkongsian yang lebih erat dengan pihak luar amat diperlukan.

Kata kunci- Kelestarian; Pengurusan Sisa; Pemerdayaan Sosial; Pertumbuhan Ekonomi

INTRODUCTION

In many developing regions, waste management is a critical issue that often intertwines with pressing social challenges such as poverty, gender inequality, and limited economic opportunities (Hoornweg & Bhada-Tata, 2012; Wilson et al., 2012). Kampung Jambangan, a small village in Southeast Asia, exemplifies a community that has transformed these challenges into opportunities for growth and empowerment, aligning its efforts with the United Nations Sustainable Development Goals (UN-SDGs). Over the past decade, Kampung Jambangan has become a model for social sustainability and eco-tourism through innovative waste management practices align with circular economy principles and community based environmental management, contributing to SDG 5 (Gender Equality) and SDG 12 (Responsible Consumption and Production) (Setyawati et al., 2015; Geissdoerfer et al., 2017; Kirchherr et al., 2017; UNDP, 2021). This case study examines how initiatives such as Bank Sampah Girly facilitated the village's transformation, which engages community members in recycling and waste management activities, providing both financial benefits and environmental education, thereby supporting SDG 1 (No Poverty) and SDG 4 (Quality Education).

Detailed observations, interviews, and data collection have provided insights into how these grassroots initiatives have fostered significant social, economic, and environmental benefits, aligning with multiple SDGs. It was conducted by the Faculty of Science and Technology (FST) students from Universiti Kebangsaan Malaysia (UKM) and Universitas Airlangga (UNAIR) and Faculty of Agriculture from Universitas Brawijaya (UB). The study focuses on the intersection of waste management and women's empowerment, highlighting strategies that engage local women in sustainable practices and enhance the

community's economic resilience and environmental stewardship, contributing to SDG 8 (Decent Work and Economic Growth) and SDG 13 (Climate Action). This case study will also discuss the broader implications of Kampung Jambangan's initiatives for social sustainability and gender equity, offering a replicable model for other communities aiming to achieve similar SDG outcomes. By providing a comprehensive analysis of the successes and lessons learned, the study aims to contribute valuable knowledge on how local efforts in waste management can lead to substantial improvements in social and economic well-being, particularly for marginalised groups such as women, thereby advancing global SDG efforts.

Figures 1 to 3 provide visual documentation of key elements contributing to the success of Kampung Jambangan's community-led sustainability initiatives. Figure 1 depicts a collaborative session involving Malaysian students and lecturers, Indonesian university students, and the Head of the Neighbourhood Watch Scheme ('*Rukun Tetangga*'). This interaction emphasises the significance of cross-institutional partnerships and educational outreach in facilitating the village's progress toward sustainable development. Whilst the notice board located in the Head Operation Room of Kampung Jambangan's Neighbourhood Watch Scheme, offering insights into the village's structured approach to waste management and community governance (Figure 2). These images highlight the activities done by their committee that support SDGs.

Figure 3 shows the Bank Sampah Girly committee. An essential component of Kampung Jambangan's transformation into an SDG model village has been the pivotal role of Bank Sampah Girly, a local non-governmental organisation (NGO) dedicated to waste management and women's empowerment. Established as a grassroots initiative, Bank Sampah Girly has been instrumental in educating and engaging



FIGURE 1. FST students and lecturers from UKM and UNAIR and FPU students from UB with the Head of Neighbourhood Watch Scheme (also known as '*Rukun Tetangga*').

the community, particularly women, in sustainable waste management practices. Through its innovative approach to recycling and waste management, Bank Sampah Girly helps reduce environmental impact and provides economic opportunities for local women, empowering them through income generation from recycled materials. Residents collect household organic waste and process it through composting activities for community gardening and urban farming purposes. Composting is a biological decomposition

process that converts organic waste into nutrient-rich material suitable for agricultural and urban gardening applications (Diaz et al., 2007; Bernal et al., 2009). This initiative also helps to increase financial independent indirectly and significantly contributed to Kampung Jambangan's recognition as a prominent SDG village in Surabaya and across Indonesia, demonstrating how community-driven approaches can effectively align with global sustainability goals (Agarwal, 2000).



FIGURE 2. Notice board of the Head Operation Room of Kampung Jambangan's Neighbourhood Watch Scheme.



FIGURE 3. Bank Sampah Girly committees

Location

The selected location for this social sustainability and women empowerment initiative is Kampung Jambangan, a sub-district in Surabaya, the capital city of East Java, Indonesia. Kampung Jambangan, which

translates to "flower place" or "pot," is emblematic of the village's commitment to fostering a healthy and clean environment. Known for its strong community spirit and residential neighbourhoods, Kampung Jambangan has emerged as a model for sustainable living within Surabaya's diverse urban landscape. As

one of Indonesia's largest cities, Surabaya comprises various sub-districts like Kampung Jambangan, each contributing uniquely to the city's cultural and environmental fabric. Kampung Jambangan stands out for its innovative approach to environmental management, particularly in its practices of waste management and community-led sustainability initiatives. These practices have not only improved local environmental conditions but also served as a model for other districts, demonstrating the effectiveness of grassroots initiatives in achieving broader urban sustainability goals.

METHODOLOGY

Planning

The primary objectives of this case study are to document and analyse the transformation of Kampung Jambangan through innovative waste management practices and to understand the pivotal role of women in driving this change. The study seeks to provide actionable insights that can be applied to other communities facing similar social and environmental challenges, offering a roadmap for sustainable development and empowerment.

The research design begins with a comprehensive literature review, focusing on existing studies related to waste management, social sustainability, and women's empowerment, with a particular emphasis on case studies from developing regions. This review examines the socio-economic context of Kampung Jambangan to understand the baseline conditions before the implementation of its transformative initiatives.

Data collection involved conducting in-depth interviews with key stakeholders, including women leaders, community members, and representatives from NGOs engaged in the initiative. A group of Bank Sampah Girly committee, consisting of members from different hierarchical levels including the head and committee members, were chosen to be interviewed which covers their organisational movement. Besides, we also interviewed a retired lecturer from Universitas Negeri Surabaya (UNESA) who made research about waste compost. These interviews provided detailed insights into the ideas, processes, and strategies that enhanced the initiative's effectiveness. Field observations were also conducted to document waste management practices and community engagement activities like eco-printing and eco-enzyme, offering a holistic view of the transformation process.

The analysis was grounded in active

community engagement and collaboration, ensuring that the perspectives and experiences of local women and community leaders were accurately represented. By involving these stakeholders as participants in the research process, the study captured a nuanced understanding of the initiatives. Collaboration with local NGOs and government agencies further strengthened the research by providing access to essential data, resources, and additional support, enriching the overall findings and impact of the study.

Strategy

To build capacity within the community, workshops and training sessions on research methods can be organised for local women, empowering them to actively engage in data collection and analysis. Additionally, knowledge exchange sessions can be facilitated between Kampung Jambangan and other communities to share best practices and lessons learned.

The dissemination and advocacy efforts will include compiling the findings into a comprehensive case study report, which will feature recommendations for scaling and replicating the initiatives in similar communities. Policy briefs will also be produced to emphasise the broader implications of the study for social sustainability and gender equity. To promote knowledge sharing, the findings can be presented at conferences, workshops, and seminars dedicated to sustainable development, women's empowerment, and waste management. Articles can be published in academic journals, online platforms, and local media to ensure wider audience engagement and advocacy for similar initiatives.

In terms of policy advocacy, partnerships can be established with NGOs and international organisations to promote the Kampung Jambangan model as an example of best practices for social sustainability and women's empowerment in developing regions.

RESULTS AND DISCUSSIONS

There was a series of firsthand experience to better understand the community-led initiatives that have been carefully reviewed by the faculty and community leaders which are eco-printing, eco-enzyme and waste management. These activities are deeply rooted in sustainable practices and local wisdom which offer significant insights into how waste can be transformed into valuable resources, fostering both environmental sustainability and social empowerment.

Initiative on Creating Sustainable Textiles through Eco Printing

Eco-printing in Kampung Jambangan is an innovative textile dyeing technique that utilizes natural materials such as leaves and flowers to imprint designs on fabrics. The use of natural materials is a unique characteristic of batik with the eco-printing technique. On 1 August 2024, two committee members of the eco-printing community in Kampung Jambangan explained the eco-printing process and shared their knowledge and experiences with students from UKM, UNAIR and UB during the session.

During our participation, we observed the meticulous process in which fabrics are pre-treated with aluminium sulphate and soda ash, preparing them for dye absorption by soaking in water for 12 hours. Then, the leaves were soaked in a ferrous sulphate

solution for 45 minutes, carefully wiped and arranged on the pre-soaked fabric, and a new fabric that was soaked in natural dye. This fabric is subsequently rolled in plastic, tied with string and steamed for two hours (Figure 4). The steamed fabric is then dried in the shade for three days.

This sustainable method not only produces unique batik designs but also minimizes the use of harmful chemicals, making it an eco-friendly alternative to conventional dyeing processes which preserves traditional craftsmanship. Besides, it provides business opportunities and a source of income through the production of eco-printed headscarves, clothing, handbags, and prayer garments (Figure 5). Implementing this technique at FST UKM could provide students with firsthand experience through workshops and seminars that focus on sustainable textile production and environmental stewardship.



FIGURE 4. Learning eco-printing textile production.



FIGURE 5. Textile product.

Initiative on Transforming Organic Waste into Eco Enzyme

Our observation of the eco-enzyme production process in Kampung Jambangan revealed a simple yet effective method for repurposing organic waste into a multi-functional cleaning agent (Figure 6). Two committee members of the eco-enzyme production, who are also residents of Kampung Jambangan, explained the step-by-step process and its practical applications to the participants. Through a combination of direct observation, active participant engagement, and live demonstrations, we gained a comprehensive understanding of this community-driven waste management model.

The process involves fermenting organic waste, such as soft fruit peels and fresh vegetable scraps that were uncooked and washed, with sugar and water with a ratio of 3:1 for three months. However, durian, jackfruit, snake fruit and cassava are not suitable to use in this process. These fruits are avoided due to their high fibre, starch, and fat content, which can slow microbial activity and hinder efficient decomposition. Whilst fruits like durian which have strong odours, may disrupt small-scale composting environments,

further complicating the process. According to the community committee, maintaining high fermentation quality and mitigating spoilage risks depends heavily on the strategic selection of raw ingredients. These factors contribute to the unsuitability of certain fruits to produce optimal eco-enzyme results.

As a result, the fermentation produces enzymes that can be used as natural detergents, floor cleaners, hand and body soap and even fertilizers, thus contributing to a circular economy. This method, as noted by several studies, offers a sustainable alternative to conventional cleaning products, reducing waste and chemical use. Afterwards, these enzymes will be stored in a plastic container for three months by slightly opening the lid weekly and monthly to release fermented gas and be placed away from direct sunlight. The eco-enzyme has no expiration date and is a long-lasting, sustainable product. According to data provided by the committee, continuous eco-enzyme production facilitates the diversion of several kilograms of organic kitchen waste from the municipal waste stream monthly. This output represents a quantifiable environmental contribution, validating the efficacy of the initiative at the community level.

To quantify the effectiveness of the eco-



FIGURE 6. Learning eco-enzyme process.

enzyme initiative, the study employed a benchmarking framework focused on measurable outcomes. By evaluating criteria such as the diversion of food waste and increased environmental awareness among residents, the program can be directly measured against traditional household waste habits. Such indicators offer a clear assessment of the socioeconomic and ecological benefits inherent in the community-led model.

At FST UKM, eco-enzyme production could be incorporated into the environmental science or chemistry curriculum which provides the students with practical skills in waste management and sustainable chemistry. This initiative provides a scalable model for

community collaboration and low-cost sustainability, with significant potential for replication within university and residential environments. To maximize this impact, institutionalized workshops and outreach programs could be implemented, equipping residents with the technical proficiency required to convert organic waste into high-value products.

Innovative Approaches to Sustainable Waste Management

Kampung Jambangan employs both aerobic and anaerobic composting methods to manage organic

waste effectively and produce high-quality fertilizer. Aerobic composting, which relies on oxygen to decompose organic matter, is primarily used to accelerate the breakdown of kitchen scraps and garden waste. Dr. Muhammad Yati, a retired lecturer from UNESA discussed composting practices implemented in Kampung Jambangan through his research. Based on this interview, to optimise the composting process, aerobic composters are maintained at a temperature below 70 degrees Celsius, as temperatures exceeding 72 degrees Celsius can kill the beneficial decomposing bacteria essential for breaking down organic material (Bernal et al., 2009). The temperature control within these composters is crucial to maintaining microbial activity and ensuring efficient decomposition.

The compost bins in Kampung Jambangan are carefully managed to prevent conditions that are either

too wet or too dry, which can hinder the composting process (Figure 7; Figure 8). Proper moisture levels are maintained by regularly monitoring the bins and adjusting the aeration and water content as needed (Epstein, 2011). The composting process begins by layering organic waste, such as vegetable peels and garden clippings, with pre-prepared compost that has already been partially decomposed. This method helps inoculate the new waste with active microorganisms, speeding up the composting process and preventing issues such as fly breeding and larval development, which are common in unmanaged compost piles (Diaz et al., 2018). In addition to aerobic composting, anaerobic methods are used for food waste that requires longer decomposition periods and can be converted into biogas, a renewable energy source.



FIGURE 7. Explanation of compost by Dr. Muhammad Yati.



FIGURE 8. Process of decomposition

In addition to composting, Kampung Jambangan's success in waste management is supported by its waste and recycling garage also called Waste Bank, led by the Bank Sampah Girly. During this session, an interview was conducted with four committee members of Bank Sampah Girly to understand its operational mechanisms and community engagement strategies. Based on interviews with the committee members, recyclable materials are collected and sent to recycling centres approximately two times per week. Residents participating in the program are encouraged to collect a minimum amount of recyclable waste before receiving monetary returns, promoting consistent community involvement in waste segregation practices. The waste garage serves as a collection and sorting hub where residents bring recyclable materials in exchange for money or savings, encouraging community participation in recycling efforts (Figure 9). Bank Sampah Girly has been pivotal in organising the waste garage, providing education on waste segregation, and promoting the economic benefits of recycling, which aligns with SDG 8 and SDG 12.

Previous studies on waste management initiatives in Kelurahan Jambangan demonstrate measurable environmental and socioeconomic impacts arising from community-based waste banks and recycling programs. A quantitative study by Shinta and Kurniawati (2024) reported that Bank Sampah Pitoe in Jambangan actively involved approximately 100 respondents consisting of waste bank managers and customers, reflecting substantial community participation in household waste segregation and recycling activities. The study further highlighted that waste bank activities contributed to reducing the volume of waste transported to landfills while strengthening environmental awareness among residents (Shinta & Kurniawati, 2024). The decomposition process typically takes several weeks depending on moisture, aeration, and temperature conditions. The use of enclosed compost bins is important to maintain suitable moisture and temperature levels, accelerate microbial activity, and prevent pest contamination during the decomposition process.



FIGURE 9. Interview with the Bank Sampah Girly committees at the Waste Bank.

Implementing similar composting practices at FST UKM or within Malaysian communities could significantly reduce organic waste while producing valuable compost for agricultural use. This could be particularly beneficial for urban farming initiatives and sustainability projects, aligning with Malaysia's goals of promoting green technologies and sustainable waste management practices. Besides, we could bring this initiative to the Greenhouse Complex and Botanical Garden in UKM and MyAgrosis Club led by the students that enhance waste management efforts, create

economic incentives, and educate participants about sustainable practices.

IMPACTS

The initiatives in Kampung Jambangan present a dynamic model of how eco-friendly practices can drive social sustainability and empower women. These efforts have effectively combined traditional skills with modern environmental practices, creating opportunities

for both economic advancement and ecological conservation. Community-based sustainability initiatives are widely recognised for strengthening local resilience and encouraging participatory environmental governance (Salleh & Choudhury, 1996; Ostrom, 1990). In addition, women's participation in environmental and economic activities contributes significantly to social empowerment and sustainable community development (Agarwal, 2000; Cornwall, 2016).

One of the most prominent activities, eco-printing, allows women to use natural materials to produce distinctive batik designs. Eco-printing is a sustainable textile art practice that uses natural pigments and plant materials to create environmentally friendly fabric products (Flint, 2008; Gwilt, 2014). This technique not only sustains traditional crafts but also generates a reliable income by converting local resources into value-added products, particularly as global attention shifts toward more environmentally friendly alternatives. The process involves treating fabrics with aluminium sulphate and soda ash, arranging natural elements such as leaves, and steaming the fabric to produce unique patterns. These eco-printed items, including scarves and clothing, appeal to both local consumers and tourists, thereby improving the economic standing of the women involved.

Furthermore, the production of eco-enzymes from organic waste demonstrates the community's innovative approach to environmental sustainability. By repurposing kitchen scraps into multi-functional cleaning agents through a fermentation process, Kampung Jambangan promotes circular economy practices that encourage waste minimisation and resource utilisation (Geissdoerfer et al., 2017; Kirchherr et al., 2017). Eco-enzyme is a fermented liquid produced from organic waste, sugar, and water, commonly used for household cleaning, fertilising, and small-scale wastewater treatment applications (Tang & Tong, 2011). This practice helps reduce the volume of unmanaged household organic waste while equipping women with practical skills in producing environmentally friendly products that contribute to household savings and supplementary income generation. The initiative reflects how communities can leverage local knowledge and resources to strengthen economic resilience and environmental awareness, supporting broader SDGs as practiced earlier.

Additionally, the composting practices in this location highlight the community's commitment to initiative-taking waste management and sustainable agriculture. Composting is a biological decomposition process that converts organic waste into nutrient-rich material suitable for agricultural and urban gardening

purposes (Diaz et al., 2007; Bernal et al., 2009). By employing both aerobic and anaerobic composting methods, the community transforms household organic waste into compost that supports local agriculture and improves soil quality. Such community-based waste management strategies are increasingly recognised as important approaches for enhancing urban sustainability and reducing environmental burdens (Wilson et al., 2012; Anyanwu et al., 2025). This practice contributes to reducing the amount of waste sent to disposal sites while reinforcing community self-sufficiency and resilience against economic fluctuations. The careful monitoring of composting conditions also demonstrates the importance of organised community participation in maintaining sustainable environmental practices (Epstein, 2011).

Overall, the comprehensive approach taken by this village illustrates how environmental sustainability initiatives can catalyse social empowerment and economic development. The integration of waste management, community participation, and local entrepreneurship reflects the principles of a circular economy, where resources are continuously reused to minimise environmental impact (Kirchherr et al., 2017). By equipping women with skills in eco-printing, eco-enzyme production, and composting, the community not only enhances economic opportunities but also fosters a culture of sustainability with long-term social and environmental benefits. This holistic model demonstrates that grassroots environmental initiatives can transform waste into valuable community resources while strengthening local participation and sustainability practices (Salleh & Choudhury, 1996; Cornwall, 2016). As such, Kampung Jambangan's experience provides valuable insights for policymakers and development practitioners seeking to integrate sustainable development into local contexts.

CONCLUSION

The case study illustrates a successful model of integrating environmental sustainability with social empowerment, particularly for women. Through innovative practices such as eco-printing, eco-enzyme production, and effective waste management, the community has transformed waste into valuable resources, generating economic opportunities and promoting a culture of sustainability. These initiatives have not only improved local environmental conditions but also empowered women by providing them with skills and income-generating activities, supporting broader SDGs that have been empowered around

Indonesia. The strategies used in Kampung Jambangan demonstrate that grassroots initiatives can achieve significant social, economic, and environmental benefits, and they offer a replicable model for similar communities worldwide. Implementing these practices at the FST UKM and in Malaysian communities holds great potential for fostering local sustainability, enhancing environmental education, and empowering marginalized groups through sustainable development efforts.

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