Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

Integrating Waste Banks and MISEWA Production for Circular Economy-Based Community Empowerment: An Indonesia–Malaysia Cross-National Collaboration

Dewi Cahyani Pangestuti[1], Rusfian Effendi[2]*, Abdul Razak Bin Abdul Hadi[3], Zaira Aniza Samsudin[4], Wan Ainul Asyiqin Wan Mohd Razali[5]
[1,2*]Universitas Pembangunan Nasional Veteran Jakarta, Indonesia.
[3]Universiti Kuala Lumpur Business School, [4,5]Universiti Malaysia Terengganu, Malaysia.
*Corresponding Author. Email: rusfianeffendi@upnvj.ac.id

Abstract: This community service program aims to examine the implementation of a waste bank and the production of MISEWA (*Minyak Sereh Wangi*, or citronella oil) as a circular economy-based community empowerment model through Indonesia–Malaysia cross-national collaboration. The program was implemented in Limo Village, Limo Subdistrict, Depok City, West Java, Indonesia. A *Participatory Action Research* (PAR) approach was employed using a mixed-methods design. Data were collected from 25 members of the Family Welfare Movement (PKK) and environmental cadres serving as primary community partners through in-depth interviews, participatory observations, and questionnaires. Data analysis followed a convergent mixed-methods approach, integrating paired-samples *t*-tests and percentage-gain calculations to assess changes in participants' capacities, alongside thematic analysis of qualitative reflection data. The findings indicate that the waste bank initiative supported behavioral change in waste management through knowledge-based interventions, infrastructure provision, and incentive mechanisms. Meanwhile, MISEWA production demonstrated the potential to transform locally available resources into economically viable products. Collaboration between Indonesian and Malaysian universities facilitated reciprocal knowledge exchange, strengthened social capital, and enhanced institutional capacity on both sides. The program also highlighted the central role of women, who actively participated throughout all stages of implementation. Overall, the findings demonstrate how cross-national university partnerships can contribute to community empowerment and the achievement of the Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 17 (Partnerships for the Goals). The program recommends replicating and adapting this model in other communities across the ASEAN region, alongside longitudinal evaluations to assess the long-term sustainability of its impacts.

Article History:
Received: 23-08-2026
Reviewed: 26-09-2026
Accepted: 28-10-2026
Published: 20-11-2026

Key Words:
Waste Bank; MISEWA; Circular Economy; Cross-National Collaboration; Community Empowerment; Participatory Action Research.

How to Cite: Pangestuti, D. C., Effendi, R., Hadi, A. R. B. A., Samsudin, Z. A., & Razali, W. A. A. W. M. (2026). Integrating Waste Banks and MISEWA Production for Circular Economy-Based Community Empowerment: An Indonesia–Malaysia Cross-National Collaboration. *Jurnal Pengabdian UNDIKMA*, *7*(4), 1145-1156. https://doi.org/10.33394/jpu.v7i4.22397

https://doi.org/10.33394/jpu.v7i4.22397

This is an open-access article under the CC-BY-SA License.

Introduction

Environmental degradation is a major global challenge requiring coordinated action across societal sectors (Leal Filho et al., 2023). The IPCC emphasizes that policy measures alone are insufficient to achieve Paris Agreement goals without substantial behavioral change at the community level (IPCC, 2023). Accordingly, higher education institutions are increasingly recognized as agents of environmental stewardship through community

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

engagement (Findler et al., 2019; Zamora-Polo & Sánchez-Martín, 2019). Beyond their educational and research functions, universities are expected to promote sustainable community transformation through community service, known in Indonesia as *pengabdian kepada masyarakat* (Sulistyawati et al., 2022).

Earth Day, first established in 1970 and observed globally on 22 April, provides strategic momentum for mobilizing collective environmental action (Rome, 2013). The 2026 theme, "Act for Earth," calls on individuals, communities, and institutions to translate environmental awareness into tangible, small-scale actions (Network, 2026). This orientation aligns with research on pro-environmental behavior, which suggests that localized, participatory, and culturally embedded interventions are more likely to produce sustained behavioral change than top-down directives (Gifford & Nilsson, 2014; Steg & Vlek, 2009). Within this context, community-based environmental programs, particularly those facilitated through university–community partnerships, are recognized as effective vehicles for promoting environmental literacy, civic engagement, and social empowerment (Kollmuss & Agyeman, 2002; Leal Filho et al., 2023)

Waste management is a critical dimension of grassroots environmental action in rapidly urbanizing Southeast Asia, where Indonesia, ranked as the world's fourth most populous nation, produces approximately 68.5 million tonnes of solid waste annually, much of which remains inadequately managed (Indonesia, 2024). The *bank sampah* (waste bank) model, a community-managed system of collection and recycling, represents a distinctive Indonesian innovation in decentralized governance (Asteria & Heruman, 2016; Wijayanti & Suryani, 2015). By transforming household waste into economic value through sorting, depositing, and recycling, waste banks simultaneously mitigate environmental pollution and strengthen community economic resilience (Raharjo et al., 2022). Despite their promise, questions of scalability and cross-cultural transferability remain underexplored, particularly within the context of international university collaboration (Permana et al., 2023). Prior to intervention, the partner community faced severe localized environmental management issues. Household waste was routinely left unsorted, leading to open dumping and illegal burning in vacant residential lots due to the absence of a structured community waste collection system. Furthermore, abundant local biological assets, specifically lemongrass (*Cymbopogon citratus*), remained entirely unutilized due to a lack of technical processing skills and green entrepreneurial frameworks. Without organizational infrastructure, financial incentives, or technical capacity, the community was unable to convert local waste streams and natural resources into sustainable economic opportunities.

Complementing the waste bank initiative, the production of MISEWA (Minyak Sereh Wangi), an eco-friendly lotion derived from lemongrass (*Cymbopogon citratus*), represents an innovative model of community-based green entrepreneurship. Lemongrass, widely documented for its antioxidant, antimicrobial, and insect-repellent properties (Ekpenyong et al., 2015; Shah et al., 2011), provides a locally available resource that supports value-added processing within a circular-economy paradigm that emphasizes resource optimization and sustainable production (Kirchherr et al., 2017). As part of a community empowerment program, MISEWA embodies the convergence of environmental sustainability, indigenous knowledge valorization, and grassroots economic development, a nexus critical to advancing the United Nations Sustainable Development Goals (SDGs), particularly SDG 11 on sustainable cities, SDG 12 on responsible consumption, and SDG 17 on partnerships for sustainability (United Nations, 2015).

Copyright © 2026, The Author(s)

Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

To address complex localized environmental challenges, cross-border academic synergy offers a high-impact framework. This community service program establishes a strategic partnership between the Faculty of Economics and Business, Universitas Pembangunan Nasional Veteran Jakarta (UPNVJ), Indonesia, and Universiti Malaysia Terengganu (UMT), Malaysia. This transnational collaboration serves as a strategic synthesis: UPNVJ leverages its expertise in Indonesian *institutional social-nudge* frameworks, specifically through community-based organizational mechanisms like the Waste Bank (*Bank Sampah*) and grassroots women's networks (PKK), while UMT contributes specialized technical capacity in *green product science* (bio-resource extraction and eco-friendly formulation) and environmental management. This horizontal exchange elevates local social interventions into a scientifically validated, circular economy empowerment model. The collaboration reflects the growing trend of transnational university partnerships for sustainable development (Leal Filho et al., 2024; Tilbury, 2011). Such cross-border engagement facilitates the exchange of best practices and contextual knowledge among ASEAN nations with comparable geographical, climatic, and socioeconomic conditions (Zen et al., 2016), strengthens the internationalization of *pengabdian kepada masyarakat* by elevating it from a domestic obligation to a globally relevant scholarly endeavor (Knight, 2015), and provides an empirical basis for examining culturally distinct responses to similar environmental interventions, thereby enriching theoretical understandings of pro-environmental behavior across cultural contexts (Schultz et al., 2005).

Despite increasing recognition of university-led community environmental programs, notable gaps remain in the literature. Scholarship on waste banks is largely confined to descriptive case studies within single national contexts, with limited exploration of their pedagogical and empowerment dimensions when implemented through international academic partnerships (Asteria & Heruman, 2016; Raharjo et al., 2022). Similarly, while circular economy research has focused extensively on industrial-scale applications, community-level green product innovation such as the MISEWA initiative has received comparatively little scholarly attention (Geissdoerfer et al., 2017; Permana et al., 2023). Moreover, the intersection of Earth Day commemorative activities with structured higher education community service programs remains underexamined both empirically and conceptually, leaving an important area for future inquiry.

According to the information above, this community service program aims to: (1) to describe the design and implementation of waste bank and MISEWA production activities as integrated community empowerment interventions; (2) to examine participatory processes and knowledge exchange dynamics within the Indonesia–Malaysia university collaboration; and (3) to evaluate the program's contributions to environmental awareness, community economic capacity, and the broader discourse on university social responsibility for sustainable development. Framed within theories of pro-environmental behavior (Steg & Vlek, 2009), community-based social marketing (McKenzie-Mohr, 2011), and the circular economy (Kirchherr et al., 2017). This community service contributes directly to strengthening community capacity of scholarship on higher education's role in advancing grassroots sustainability through international collaboration.

Method

The implementation of this community service program utilized a Participatory Action Research (PAR) framework, which integrates intervention and knowledge generation through iterative cycles of planning, action, observation, and reflection (Kemmis et al., 2014;

Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

Reason & Bradbury, 2008; Chevalier & Buckles, 2019). PAR facilitated the co-production of knowledge among academic staff, students, and Indonesian–Malaysian community participants in the *Act for Earth 2026: Small Action for Community* program. A qualitative descriptive approach was chosen to examine process-oriented and context-dependent issues, program design, participatory dynamics, cross-national knowledge exchange, and contributions to environmental awareness and community economic capacity, capturing mechanisms and contextual factors beyond the scope of quantitative measures (Creswell & Poth, 2018). The program also adopted a single-case study perspective, with *Act for Earth 2026* defined temporally by the Earth Day 2026 commemoration, institutionally by the FEB UPN Veteran Jakarta–UMT partnership, and thematically by the establishment of a waste bank and MISEWA production, thereby enabling an in-depth, context-sensitive analysis of program outcomes (Yin, 2018).

The community service program was centered in Limo Village, Limo Subdistrict, Depok City, West Java Province, Indonesia to commemorate Earth Day 2026 on 22nd April 2026. The primary partner organizations comprised the Limo Village PKK Women's Association and the management team of Bank Sampah "Limo Mandiri". A total of 45 primary participants actively engaged across all implementation stages, representing four key stakeholder groups: Community Partners (25 participants) from Local PKK members and environmental cadres, UPNVJ Academic Facilitators (10 participants) from 6 faculty members and 4 undergraduate students, UMT Academic Experts (7 participants) from 4 faculty members and 3 postgraduate researchers, and local Government Representatives (3 participants) from Village officials and Depok Environmental Agency staff. It was jointly implemented by FEB UPN Veteran Jakarta, Indonesia, and Universiti Malaysia Terengganu (UMT), Malaysia. This partnership was supported by an existing memorandum of understanding, complementary institutional expertise in community economic empowerment and environmental sustainability, and a shared ASEAN socioecological and policy context (Secretariat, 2016). The target community was selected purposively according to four criteria: existing solid-waste management challenges, access to lemongrass (*Cymbopogon citratus*) resources, community organizations capable of sustaining program outcomes, and logistical accessibility for both academic teams. These criteria reflect community-based social marketing principles, which emphasize selecting settings with conditions that support the adoption and maintenance of desired behaviors (McKenzie-Mohr, 2011).

Participants comprised four interconnected stakeholder groups: (1) faculty members and undergraduate students from FEB UPN Veteran Jakarta, who facilitated waste-bank and MISEWA-production training while documenting implementation processes; (2) faculty members and students from UMT's economics and business departments, who contributed comparative perspectives on Malaysian community waste-management practices and supported program delivery; (3) community members, including household representatives, local leaders, women's groups, and youth volunteers; and (4) local government representatives responsible for environmental management and community development. Community members served as active co-creators whose knowledge of local waste patterns, raw-material availability, and social dynamics informed adaptation of the intervention, consistent with participatory action research principles (Reason & Bradbury, 2008). Institutional stakeholders provided regulatory and logistical support to facilitate integration and sustainability of the waste bank within local governance structures. Participants were recruited through purposive and snowball sampling. Initial coordination with community leaders and local government offices was followed by recruitment through community

Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

networks. Direct participation was documented through attendance registers, whereas indirect beneficiaries, such as household members and neighbors reached through knowledge dissemination, were estimated using post-program community surveys.

The program implementation followed a structured three-phase design: preparation, execution, and evaluation that reflects the cyclical planning–action–observation–reflection model characteristic of participatory action research (Kemmis *et al.*, 2014). Each phase is described in detail below.

Phase I: Preparation (Pre-Implementation)

The preparation phase comprised four components. First, FEB UPN Veteran Jakarta and UMT conducted virtual coordination meetings to define program objectives, timelines, responsibilities, logistics, and culturally appropriate bilingual training strategies for Bahasa Indonesia–Bahasa Melayu/English participants. Second, consultations with community leaders and local government representatives identified local waste-management issues, available resources, and community priorities. The findings informed adaptation of the waste-bank model and the selection of lemongrass (*Cymbopogon citratus*) for the MISEWA workshop, based on local availability and community interest in natural personal-care products. Third, the teams prepared waste-sorting equipment, MISEWA production inputs, and bilingual educational materials. Finally, student volunteers from both institutions completed training-of-trainers sessions covering technical procedures, participatory facilitation, culturally sensitive communication, and conflict-resolution skills.

Phase II: Execution (On-Site Implementation)

On-site implementation, conducted around Earth Day 2026 (22 April 2026), consisted of two modules:

Module A: Waste Bank Establishment and Training.

Participants attended an interactive orientation on waste-bank operations and their environmental and economic benefits, followed by practical training in household-waste sorting. Community members then established the waste-bank structure by appointing a coordinator, treasurer, and sorting team; receiving waste-bank passbooks; and completing a simulated deposit–weigh–record–credit transaction. Operational knowledge and governance responsibilities were transferred to the community, while the university teams retained advisory roles.

Module B: MISEWA Production Workshop.

Participants learned about the potential use of lemongrass (*Cymbopogon citratus*) in green-product innovation before undertaking supervised, small-group production of MISEWA. Activities included raw-material preparation, extract processing, emulsification, basic quality assessment, packaging, and introductory branding, labeling, and pricing exercises to support possible microenterprise development. Products were distributed for personal use, while selected samples were retained for quality evaluation.

Phase III: Evaluation and Reflection (Post-Implementation)

The post-implementation phase involved three evaluation activities. First, a participatory reflection session engaged all stakeholder groups in discussing learning experiences, implementation challenges, and recommendations for future program cycles. Second, community participants completed a structured feedback questionnaire assessing self-reported changes in environmental awareness, waste-sorting knowledge, and intention to continue waste-bank and MISEWA production activities. Third, the FEB UPN Veteran Jakarta and UMT teams conducted a joint debriefing to consolidate field observations,

Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

compare cross-national perspectives, and identify improvements for future collaborative community-service initiatives.

Consistent with the qualitative descriptive and participatory action research design, data were collected through methodological triangulation to strengthen the credibility of the findings (Denzin, 2012; Lincoln & Guba, 1985). Four complementary sources were used: (1) Participant observation: Academic teams from FEB UPN Veteran Jakarta and UMT acted as participant observers throughout implementation. Structured field notes documented activities, participant engagement, communication patterns, enabling and constraining factors, and notable incidents. This dual role as facilitator and observer is inherent to participatory action research (Reason & Bradbury, 2008). (2) Semi-structured interviews: Post-program interviews were conducted with purposively selected community leaders, community participants, student facilitators, and academic supervisors. Questions addressed program relevance, cross-cultural knowledge exchange, implementation barriers and enablers, and the perceived capacity to sustain waste-bank and MISEWA activities. Interviews were conducted in Bahasa Indonesia or Bahasa Melayu, audio-recorded with informed consent, and transcribed for analysis. (3) Documentary evidence: Planning documents, meeting minutes, attendance lists, transaction records, production logs, photographs, videos, feedback forms, and related materials were used to corroborate observational and interview evidence. (4) Questionnaire assessment: A five-point Likert-scale questionnaire assessed perceived changes in environmental awareness, waste-management knowledge, and green-product production skills. Open-ended items captured participants' perceived benefits and recommendations, providing a complementary quantitative dimension to the qualitative analysis (Creswell & Plano Clark, 2018).

Program impact and improvements in partner capacity were evaluated using a convergent mixed-methods design (Creswell & Plano Clark, 2018). Quantitative evaluation measured knowledge gains and technical skill acquisition by comparing pre-test and post-test scores across the 25 primary community participants using paired-sample t-tests and percentage gains. Partner engagement was assessed through active attendance and completion rates across all 45 involved stakeholders. Furthermore, organizational capacity was evaluated through concrete institutional and enterprise milestones: (1) the operational establishment of Bank Sampah "Limo Mandiri" (measured by active waste collection volume and customer passbook setup), and (2) the launch of the MISEWA green microenterprise (measured by unit production yield and cost-accounting readiness). Qualitative data from field observations and reflection sessions were analyzed using condensed thematic analysis (Braun & Clarke, 2006) by the program facilitation team to capture organizational dynamics and behavioral adoption.

Result and Discussion

To measure the direct impact of the capacity-building workshops, a quantitative evaluation was conducted with the 25 primary community partners. Participant competencies were assessed before (*pre-test*) and immediately following (*post-test*) the hands-on training sessions using a 100-point practical assessment scale. As shown in Table 1, the program achieved substantial, measurable improvements across all practical learning indicators.

Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

Table 1. Quantitative Evaluation of Partner Capacity and Learning Outcomes (N=25)

Competency Dimension	Pre-Test Mean (%)	Post-Test Mean (%)	Absolute Gain (%)	Direct Practical Outcome
Waste Sorting & Management Literacy	42.5%	88.3%	+45.8%	Correct classification of organic, inorganic (PET, HDPE, metals, paper), and hazardous waste.
Waste Bank Operational Procedures	38.0%	85.6%	+47.6%	Ability to weigh, record, and log recyclables into waste passbooks (*Buku Tabungan Sampah*).
MISEWA Formulation & Production Skills	35.0%	87.2%	+52.2%	Hands-on formulation, emulsification, and bottle packaging of lemongrass lotion.
Costing, Eco-Labeling & Pricing	31.2%	81.4%	+50.2%	Calculation of product Cost of Goods Sold (COGS) and unit pricing.
Overall Average Capacity	36.7%	85.6%	+48.9%	Established independent community management capacity.

Enhanced Community Capacity and Behavioral Change

The waste-bank training improved participants' knowledge of waste classification, the economic value of recyclables, and the environmental impacts of improper disposal. Questionnaire results and interviews indicated a shift from awareness toward behavioral intention, with participants describing the training as a *pencerahan* that reframed household waste as a resource. Accessible sorting infrastructure and simulated financial transactions appeared to make recycling more practical and motivating. Nevertheless, because the observed changes were largely immediate and self-reported, sustained behavioral change requires post-program monitoring and continued institutional support (Steg & Vlek, 2009; Thaler & Sunstein, 2008; Gifford & Nilsson, 2014).

The MISEWA workshop strengthened participants' practical skills across the production cycle, from raw-material preparation to packaging and labeling. Participants reported confidence in replicating the process after direct practice, facilitator demonstrations, and supervised production. The inclusion of product naming, label design, and pricing introduced basic entrepreneurial capabilities. These findings indicate initial knowledge transfer and skill acquisition, although independent replication and product quality should be verified through follow-up mentoring.



Figure 1. Participant and Lecturers at UPNV Jakarta – UMT

Establishment of Waste Bank Infrastructure

The program established a community-managed waste-bank structure through the election of a coordinator, treasurer, and sorting team. These roles created basic governance mechanisms, including task division, accountability, and operational responsibility for waste

Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

collection and sorting. Importantly, this structure emerged from community initiative rather than being imposed by the academic team, strengthening local ownership and legitimacy. The finding supports the value of locally governed, polycentric arrangements in sustaining community-based waste management (Ostrom, 2010; Marshall, 2008; Asteria & Heruman, 2016).

Regular sorting activities, shared governance, and collective economic benefits fostered interaction, reciprocity, and trust among participants. Observations identified informal support networks, voluntary leadership among previously less-engaged residents, and collective pride in establishing a community-managed institution. These are early indications of social capital that may support participation, resilience, and self-governance. Given the short implementation period, they should not yet be interpreted as evidence of sustained social-capital development (Putnam, 2000; Asteria & Heruman, 2016; Pretty & Ward, 2001).



Figure 2. Execution

Technology Transfer of MISEWA and Green Entrepreneurship

The MISEWA initiative demonstrated how locally available lemongrass (*Cymbopogon citratus*) can be processed into a value-added personal-care product through simple, low-technology methods. The activity linked scientific knowledge of lemongrass properties with community practice and promoted environmentally conscious production through natural ingredients and reusable or recyclable packaging. This represents an early example of grassroots circular-economy practice and supports responsible consumption and production under SDG 12 (Stahel, 2016; Velenturf & Purnell, 2021; United Nations, 2015).

By integrating production, branding, and pricing, the workshop provided a foundation for community-based microenterprise development. Women constituted a disproportionately high share of MISEWA participants and were actively involved in production, labeling, branding, and discussions on commercialization. This suggests that MISEWA contributed incidentally to women's economic empowerment and SDG 5, although the program did not conduct a comprehensive gender analysis. Future program iterations should use gender-responsive recruitment, facilitation, and gender-disaggregated outcome data (Duflo, 2012; Kabeer, 2015; Markman et al., 2016).

Cross-National Collaboration and Sustainability Roadmap

The Indonesia–Malaysia collaboration enabled reciprocal learning rather than a donor–recipient relationship. Indonesia contributed practical experience with the community waste-bank model, while Malaysia contributed perspectives on environmental science, marine sustainability, regulatory frameworks, and coastal and rural development. Interview data indicated that community-level self-governance mechanisms similar to Indonesian waste

Jurnal Pengabdian UNDIKMA:
Jurnal Hasil Pengabdian & Pemberdayaan kepada Masyarakat
https://e-journal.undikma.ac.id/index.php/jpu/index
Email: pengabdian@undikma.ac.id

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

banks are less common in Malaysia, and several Malaysian participants expressed interest in adapting the model. The shared ASEAN context supported peer-to-peer learning and suggested potential for cross-national transfer of the waste-bank approach (Mawdsley, 2012; Raharjo et al., 2022; Wijayanti & Suryani, 2015).

To ensure continuity, FEB UPN Veteran Jakarta and UMT agreed to provide post-program mentoring through periodic virtual consultations with the waste-bank coordinator, treasurer, sorting team, and MISEWA production group. The mentoring will monitor waste-bank transactions and sorting practices, address operational constraints, improve MISEWA product quality and packaging, and support basic marketing, record-keeping, and commercialization. Community partners will document activities and share progress reports with both universities, while the academic teams will provide technical guidance and facilitate connections with relevant local stakeholders. This mechanism constitutes an initial sustainability roadmap; its effectiveness should be assessed through follow-up monitoring rather than assumed. It can be explaind in the table below.

Table 2. Six-Month Sustainability Follow-Up Action Plan (RTL)

Phase / Timeline	**Key Activity & Operational Focus**	**Target Deliverable / Milestone**	**Responsible Stakeholder**
Months 1–2: Legalization	Official registration of Bank Sampah "Limo Mandiri" with Depok Environmental Agency; weekly collection routines.	Depok Environmental Agency Decree (SK DLH Depok); bi-weekly collections.	Bank Sampah Board, Village Head, UPNVJ Team.
Months 3–4: Licensing	Applying for Home Industry Health Permit (P-IRT/BPOM) for MISEWA lotion; eco-packaging refill optimization.	P-IRT submission; 25% reduction in primary packaging waste.	MISEWA Cadre Team, UMT & UPNVJ Experts.
Months 5–6: Marketing	Integrating products into e-commerce (Tokopedia/Shopee); peer-to-peer training for adjacent RTs.	Verified online store setup; 2 new satellite waste nodes.	Youth Cadres (Karang Taruna), UPNVJ Digital Team.
Ongoing (Bi-Monthly)	Virtual monitoring debriefs and financial audits via shared online dashboard.	Bimonthly progress reports on waste volume and savings.	Joint UPNVJ–UMT Steering Committee.

The program demonstrates how university-led community engagement can integrate education, research, and community service while contributing to multiple SDGs. Waste-bank and circular-economy activities align with SDG 11 and SDG 12; knowledge transfer supports SDG 4; women's participation supports SDG 5; and the Indonesia–Malaysia partnership reflects SDG 17. Although limited in scope, the waste bank and MISEWA initiatives function as local capacity-building efforts that may contribute to broader sustainability transitions through continued operation, skill development, and cross-national knowledge exchange (Sulistyawati et al., 2022; Leal Filho et al., 2024; Ostrom, 2010).

Conclusion

Based on the implementation of this cross-border community service program in Limo Village, five key conclusions align directly with the program evaluation: (1) Behavioral Change in Waste Management: The waste bank initiative effectively promoted household-

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

level pro-environmental behavior by integrating knowledge-based training, physical infrastructure provision, and financial incentive mechanisms. (2) Grassroots Resource Valorization: The production of MISEWA demonstrated practical circular economy principles, proving that abundant local lemongrass resources can be valorized into economically viable products through grassroots green entrepreneurship. (3) Reciprocal Transnational Collaboration: The Indonesia–Malaysia university partnership facilitated horizontal and reciprocal epistemic exchange, strengthening social capital and institutional capacity for both academic institutions and community structures. (4) Gender Inclusivity and Social Agency: The program highlighted significant gender participation, demonstrating the decisive and active leadership role of local women cadres across all implementation stages. (5) Advancing University SDG Mission: Higher education community engagement can be meaningfully realized through cross-national partnerships oriented toward Sustainable Development Goals, specifically SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), and SDG 17 (Partnerships for the Goals).

Recommendation

Local governments and policy stakeholders should adopt a community-based waste bank model within integrated waste management policies, supported by sustained regulation, funding, and technical assistance. Universities are encouraged to expand cross-border collaborative programs across ASEAN communities, institutionalized through Memoranda of Understanding and faculty–student exchanges to ensure long-term sustainability. Communities and target groups should continuously strengthen managerial and marketing capacities for recycled and green entrepreneurship products such as MISEWA, enabling their transformation into economically independent microenterprises. Future community service initiatives incorporate longitudinal research frameworks to monitor the long-term behavioral retention, financial self-sufficiency, and environmental impacts of the intervention.

References

Asteria, D., & Heruman, H. (2016). Bank sampah sebagai alternatif strategi pengelolaan sampah berbasis masyarakat di Tasikmalaya. *Jurnal Manusia Dan Lingkungan*, *23*(1), 136–141.

Bom, S., Jorge, J., Ribeiro, H. M., & Marto, J. (2019). A step forward on sustainability in the cosmetics industry: A review. *Journal of Cleaner Production*, *225*, 270–290.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Chevalier, J. M., & Buckles, D. J. (2019). *Participatory Action Research: Theory and Methods for Engaged Inquiry* (2nd ed.). Routledge.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). SAGE Publications.

Creswell, J. W., & Poth, C. N. (2018). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (4th ed.). SAGE Publications.

Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, *6*(2), 80–88.

Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature*, *50*(4), 1051–1079.

Ekpenyong, C. E., Akpan, E., & Nyoh, A. (2015). Ethnopharmacology, phytochemistry, and biological activities of Cymbopogon citratus (DC.) Stapf extracts. *Chinese Journal of Natural Medicines*, *13*(5), 321–337.

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

Escobar, A. (2011). *Encountering Development: The Making and Unmaking of the Third World*. Princeton University Press.

Findler, F., Schönherr, N., Lozano, R., Reider, D., & Martinuzzi, A. (2019). The impacts of higher education institutions on sustainable development. *International Journal of Sustainability in Higher Education*, *20*(1), 23–38.

Geissdoerfer, M., Savaget, P., Bocken, N. M. P., & Hultink, E. J. (2017). The circular economy – A new sustainability paradigm? *Journal of Cleaner Production*, *143*, 757–768.

Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour. *International Journal of Psychology*, *49*(3), 141–157.

Hall, J. K., Daneke, G. A., & Lenox, M. J. (2010). Sustainable development and entrepreneurship: Past contributions and future directions. *Journal of Business Venturing*, *25*(5), 439–448.

Indonesia, M. of E. and F. of. (2024). *Statistik pengelolaan sampah nasional 2024*. KLHK.

IPCC. (2023). *AR6 Synthesis Report: Climate Change 2023*. Intergovernmental Panel on Climate Change.

Kabeer, N. (2015). Gender, poverty, and inequality: A brief history of feminist contributions in the field of international development. *Gender & Development*, *23*(2), 189–205.

Kemmis, S., McTaggart, R., & Nixon, R. (2014). *The Action Research Planner: Doing Critical Participatory Action Research*. Springer.

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, *127*, 221–232. https://doi.org/10.1016/j.resconrec.2017.09.005

Knight, J. (2004). Internationalization remodeled: Definition, approaches, and rationales. *Journal of Studies in International Education*, *8*(1), 5–31.

Knight, J. (2015). International universities: Misunderstandings and emerging models? *Journal of Studies in International Education*, *19*(2), 107–121.

Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Prentice Hall.

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, *8*(3), 239–260. https://doi.org/10.1080/13504620220145401

Leal Filho, W., Lange Salvia, A., & Eustachio, J. H. P. P. (2024). Universities, Sustainability and Society: Supporting the Implementation of the SDGs. In *World Sustainability Series*. Springer.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. SAGE Publications.

Markman, G. D., Russo, M., Lumpkin, G. T., Jennings, P. D., & Mair, J. (2016). Entrepreneurship as a platform for pursuing multiple goals: A special issue on sustainability, ethics, and entrepreneurship. *Journal of Management Studies*, *53*(5), 673–694.

Marshall, G. R. (2008). Nesting, subsidiarity, and community-based environmental governance beyond the local level. *International Journal of the Commons*, *2*(1), 75–97.

Mawdsley, E. (2012). *From Recipients to Donors: Emerging Powers and the Changing Development Landscape*. Zed Books.

McKenzie-Mohr, D. (2011). *Fostering Sustainable Behavior: An Introduction to Community-Based Social Marketing* (3rd ed.). New Society Publishers.

Nations, U. (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*. United Nations.

Network, E. D. (2026). *Act for Earth 2026: Campaign overview*. https://www.earthday.org

Ostrom, E. (2010). Beyond markets and states: Polycentric governance of complex economic systems. *American Economic Review*, *100*(3), 641–672. https://doi.org/10.1257/aer.100.3.641

Vol. 7, No. 4 (November 2026)
E-ISSN : 2722-5097
Pg : 1145-1156

Permana, A. S., Towolioe, S., & Aziz, N. A. (2023). Waste bank performance and community participation: Lessons from Southeast Asia. *Sustainability*, *15*(4), 3312.

Pretty, J., & Ward, H. (2001). Social capital and the environment. *World Development*, *29*(2), 209–227.

Putnam, R. D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. Simon & Schuster.

Raharjo, S., Matsumoto, T., Ihsan, T., & Rachman, I. (2022). Community-based waste management through waste bank system in Indonesia. *Journal of Material Cycles and Waste Management*, *24*(3), 873–886.

Reason, P., & Bradbury, H. (2008). *The SAGE Handbook of Action Research: Participative Inquiry and Practice* (2nd ed.). SAGE Publications.

Rome, A. (2013). *The Genius of Earth Day: How a 1970 Teach-In Unexpectedly Made the First Green Generation*. Hill and Wang.

Schultz, P. W., Gouveia, V. V, Cameron, L. D., Tankha, G., Schmuck, P., & Franěk, M. (2005). Values and their relationship to environmental concern and conservation behavior. *Journal of Cross-Cultural Psychology*, *36*(4), 457–475.

Secretariat, A. (2016). *ASEAN Socio-Cultural Community Blueprint 2025*. ASEAN Secretariat.

Shah, G., Shri, R., Panchal, V., Sharma, N., Singh, B., & Mann, A. S. (2011). Scientific basis for the therapeutic use of Cymbopogon citratus (Stapf). *Journal of Advanced Pharmaceutical Technology & Research*, *2*(1), 3–8.

Stahel, W. R. (2016). The circular economy. *Nature*, *531*(7595), 435–438.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, *29*(3), 309–317. https://doi.org/10.1016/j.jenvp.2008.10.004

Sulistyawati, S., Sujono, S., & Hadi, S. (2022). Pengabdian kepada masyarakat dalam perspektif tridharma perguruan tinggi di Indonesia. *Jurnal Pengabdian Masyarakat*, *3*(2), 112–125.

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Yale University Press.

Tilbury, D. (2011). *Education for Sustainable Development: An Expert Review of Processes and Learning*. UNESCO.

Trencher, G., Yarime, M., McCormick, K. B., Doll, C. N. H., & Kraines, S. B. (2014). Beyond the third mission: Exploring the emerging university function of co-creation for sustainability. *Science and Public Policy*, *41*(2), 151–179.

Velenturf, A. P. M., & Purnell, P. (2021). Principles for a sustainable circular economy. *Sustainable Production and Consumption*, *27*, 1437–1457.

Wijayanti, D. R., & Suryani, S. (2015). Waste bank as community-based environmental governance: A lesson learned from Surabaya. *Procedia - Social and Behavioral Sciences*, *184*, 171–179.

Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6th ed.). SAGE Publications.

Zamora-Polo, F., & Sánchez-Martín, J. (2019). Teaching for a better world: Sustainability and SDGs in the training of higher education students. *Sustainability*, *11*(15), 4224.

Zen, I. S., Noor, Z. Z., & Yusuf, R. O. (2016). The profiles of household solid waste recyclers and non-recyclers in Kuala Lumpur, Malaysia. *Habitat International*, *42*, 83–89.

Copyright © 2026, The Author(s)