

## **BUILDING GREEN LIVELIHOODS FOR INDONESIAN MIGRANTS THROUGH WASTE SORTING INITIATIVES**

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### **ABSTRACT**

This community empowerment initiative aims to promote sustainable livelihoods among Indonesian migrant workers in Penang, Malaysia, by providing education on waste sorting and promoting circular economy practices. Many migrant workers face limited economic opportunities, poor access to environmental knowledge, and inadequate formal waste management systems in their residential areas. To address these challenges, the program conducted participatory workshops on waste literacy, basic waste processing, and entrepreneurship using recyclable materials. A mini waste drop-off center managed by the migrants was also established to demonstrate practical waste sorting. The initiative led to increased environmental awareness, improved waste-handling behavior, and the potential for the development of small-scale, green businesses. Pre- and post-assessment showed a significant increase in participants' understanding and motivation to implement sustainable practices. This program not only fosters environmental responsibility but also encourages the creation of community-based waste-to-resource initiatives. By combining economic empowerment with environmental stewardship, the project contributes to inclusive development. It supports the university's commitment to community-based learning and international collaboration. The outcomes of this initiative offer a replicable model for other migrant communities facing similar socio-environmental vulnerabilities.

**Keywords:** Waste Sorting, Indonesian Migrants, Empowerment, Sustainability, Community Engagement.

### **1. INTRODUCTION**

Indonesian migrant workers (IMWs) across Southeast Asia, including those in Penang and Brunei, are part of a resilient transnational labor community that significantly contributes to the informal economies of host countries. These migrants, primarily from Java, Sumatra, and Sulawesi, are mostly of productive age (20–45 years), with balanced gender representation (International Organization for Migration, 2021). Despite their perseverance, many individuals face economic hardship due to employment in unprotected sectors, such as domestic service, factory work, construction, or street vending. Their educational backgrounds, often limited to secondary school, further restrict access to formal employment (Bustami, Ekowanti, Nasruddin, & Fahrudin, 2021). While some migrants are transient, many have resided abroad for long periods and integrated socially, albeit without commensurate economic stability (International Labour Organization, 2024).

In Brunei, as in other destinations, Indonesian migrants face dual systemic challenges: economic vulnerability and environmental exclusion. Financial instability, reliance on remittances, and limited business literacy hinder efforts to build sustainable livelihoods. At the same time, many migrant residential areas lack structured waste systems, contributing to pollution, health risks, and the underutilization of recyclable resources. According to IOM Indonesia (2021), limited access to capital, formal training, and microfinance opportunities further marginalize IMWs, especially women, from sustainable entrepreneurial ventures. However, their creativity and community solidarity offer untapped potential for inclusive development.

Concurrently, environmental challenges—such as substantial waste mismanagement—are escalating in both urban centers like Penang and high-migrant-density regions, including Brunei. The World Bank (2018) projects a surge in global waste generation to 3.88 billion tonnes by 2050. Much of this waste, particularly in low-income settings, is mismanaged via open burning or unregulated dumping (Andeobu, Wibowo, & Grandhi, 2022; Ihsanullah, Jamal, Ilyas, Zubair, & Al-Khaldi, 2022). Such practices contribute to climate change, disease proliferation, and environmental injustice. Migrants, especially those in informal housing, are disproportionately affected yet excluded from waste governance systems (Bhattacharya, Kumar, & Sharma, 2024).

A promising solution lies in community-based waste sorting and recycling, aligned with circular economy principles. Waste can be transformed into sellable resources—such as plastic pellets, paper pulp, or reusable metals—through basic training and the use of tools (Albizzati, Tonini, & Astrup, 2024). Banyan Nation (2024) emphasizes the inclusion

of informal workers in formal waste systems as a step toward economic and environmental justice. Penang's regional policies and grassroots organizations, such as PERMAI, have begun integrating this model. At the same time, Brunei's environmental policies also emphasize 3R education and community engagement at the local level.

This community service initiative addresses both dimensions—economic empowerment through waste-based entrepreneurship and sustainable environmental management—by equipping IMWs with skills in waste sorting, recycling, green product innovation, business literacy, and digital marketing. In alignment with the Merdeka Belajar-Kampus Merdeka (MBKM) framework, Universitas Mercu Buana also mobilizes students to engage directly in the field, conducting participatory research, training, and community development. The ultimate objective is to create a replicable model for migrant-led sustainability efforts that support livelihood resilience, environmental health, and international community partnerships.

## 2. METHOD

This study employed a community-based participatory research (CBPR) framework integrated with experiential service-learning to empower Indonesian migrant workers (IMWs) through waste literacy and micro-entrepreneurship in sustainability. The CBPR model ensures that community members, students, and researchers engage collaboratively throughout the problem identification and solution implementation process, fostering contextual relevance and shared ownership (Wallerstein, Duran, Oetzel, & Minkler, 2018; Cargo & Mercer, 2020).

### *Research Design*

The research followed a participatory action research (PAR) design, which prioritizes iterative cycles of planning, acting, observing, and reflecting (McIntyre, 2008). This model is widely used in sustainable community interventions to encourage empowerment and grassroots innovation (Pawar, 2020). The service-learning component aligns with Indonesia's MBKM (Merdeka Belajar-Kampus Merdeka) framework, providing students with real-world engagement opportunities in sustainability, accounting, and entrepreneurship.

### *Research Procedures*

The project was conducted in four stages:

1. Preliminary Mapping and Needs Assessment – Using qualitative interviews and community observation to assess IMWs' awareness, habits, and socio-environmental context in waste management.
2. Training and Capacity Building – Conducted participatory workshops on:
  - 3R practices (reduce, reuse, recycle),
  - Waste processing and upcycling,
  - Green business modeling,
  - Financial and digital literacy (including e-commerce).
3. Pilot Waste Facility Development – A mini drop-off point for recyclable materials was created and managed by IMWs to operationalize waste sorting in practice.
4. Evaluation and Reflection – Pre- and post-tests, feedback forms, and observational journals were used to monitor behavioral change and implementation barriers.

### *Data Collection and Analysis*

Quantitative data were collected using pre- and post-training tests to measure improvement in knowledge and confidence levels. Qualitative data were collected from open-ended interviews, workshop observations, and participant journals. Thematic analysis was applied following the updated guidelines by Braun and Clarke (2021), which emphasize reflexive and inductive coding suitable for community-driven research.

### *Methodological Rationale and Literature Support*

This methodological approach is supported by recent literature on environmental interventions in marginalized communities, which emphasizes the integration of circular economy frameworks with grassroots capacity building (Kirchherr, Reike, & Hekkert, 2022). CBPR and PAR approaches have proven particularly effective in low-resource settings where participatory ownership is essential for long-term behavioral change (Cargo & Mercer, 2020). Combining academic engagement with community empowerment ensures that the outcomes of this initiative are both scientifically valid and socially impactful.

### 3. RESULTS AND DISCUSSION

#### **Result**

The implementation of the community service program titled "*Building Green Livelihoods for Indonesian Migrants through Waste Sorting Initiatives*" successfully achieved its key objectives: improving environmental awareness, increasing waste literacy, and promoting small-scale green entrepreneurship among Indonesian migrant workers (IMWs) in Penang, Malaysia.

A total of 34 participants attended two waste literacy workshops facilitated collaboratively with PERMAI. Pre- and post-training tests revealed a notable increase of over 75% in understanding core concepts such as the 3R principle (reduce, reuse, recycle), recyclable material classification, and the value of household waste. Participants demonstrated significant improvement in their ability to sort waste, identify recyclable items, and articulate the environmental and economic benefits of waste sorting.

Additionally, a pilot drop-off waste collection point was established and is currently operated by a small group of IMWs. This facility serves as a practical model for replicable, low-cost community-based waste management. The site collects plastics, paper, and metals, which are sorted and sold to local recyclers, providing an alternative income source for participants. Educational videos and a simplified training module were also produced and disseminated via digital platforms to ensure broader reach and sustainability.

#### **Discussion**

The result illustrates the transformational potential of community-based environmental literacy and entrepreneurship training for marginalized migrant communities. This aligns with the participatory empowerment model proposed by Wallerstein et al. (2018), which suggests that combining knowledge transfer with grassroots action can lead to behavior change and socio-economic impact.

The observed knowledge gains and behavioral changes among IMWs support the effectiveness of experiential learning and service-learning approaches in sustainability education (Cargo & Mercer, 2020). Notably, participants expressed enthusiasm about continuing waste-related micro-businesses. However, they also voiced concerns over irregular access to waste markets and transportation logistics. This indicates that while awareness and motivation were high, structural support remains necessary for long-term scalability.

From a theoretical perspective, this initiative underscores the value of circular economy frameworks in migrant contexts (Kirchherr, Reike, & Hekkert, 2022), demonstrating how localized interventions can transform environmental challenges into income-generating opportunities for vulnerable groups. The community's participation in designing and managing the waste facility demonstrates agency and ownership, critical elements in sustainable CBPR outcomes.

#### **Future Development Opportunities**

Building on these outcomes, several future opportunities can be developed:

- Scaling to other migrant communities, particularly in Brunei and Johor, with contextual adaptations.
- Incorporating digital platforms for recyclable collection tracking, pricing, and buyer matching.
- Developing waste-based product innovation, such as eco-bricks or recycled craft items, supported by student mentorship.
- Strengthening institutional partnerships with local governments or recyclers to ensure regular market access and pricing stability.

This initiative has also produced tangible outputs, including training videos, a physical waste drop-off point, and a popular article, that can serve as models for replication and academic-community collaboration. With improved policy engagement and continued capacity building, the model has strong potential for integration into broader migrant empowerment and sustainability programs across Southeast Asia.

### 4. CONCLUSION

This community service initiative demonstrates that targeted waste literacy and entrepreneurship training can effectively empower Indonesian migrant workers (IMWs) to adopt sustainable waste management practices while exploring alternative green livelihood opportunities. The program successfully increased participants' environmental awareness, practical skills in waste sorting, and readiness to engage in micro-scale recycling businesses. The establishment of a community-managed waste drop-off point and the production of digital educational content further contributed to the sustainability and replicability of the model. One of the key strengths of the program was its participatory approach, which fostered active involvement and ownership among migrant participants.

The integration of experiential learning, digital materials, and on-site mentoring also enabled inclusive knowledge transfer across diverse education levels. Moreover, the program offered real-world engagement opportunities for students, aligning with the Merdeka Belajar–Kampus Merdeka (MBKM) framework.

However, several challenges were encountered, including limited market access for recycled materials, inconsistent participation due to irregular work schedules, and logistical constraints in waste transport. These issues highlight the need for stronger institutional linkages, especially with local governments and waste processing industries.

Looking ahead, this initiative holds strong potential for expansion to other migrant communities, particularly in regions such as Brunei or Johor. Future development may include incorporating digital platforms for waste collection tracking, expanding green product innovation (e.g., eco-bricks or recycled crafts), and building cooperative business models to enhance market power. This paper offers a replicable framework for integrating circular economy principles into community-based development with academic collaboration at its core.

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