

## Challenges and benefits of waste banks in Indonesia

University of Miyazaki, Student Member, Satwika Desantina Muktiningsih  
University of Miyazaki, Member, Tomoo SEKITO and Yutaka DOTE

### 1. Introduction

Recycling is a household waste management strategy to reduce waste and conserve natural resources<sup>1)</sup>. In Indonesia, waste bank mechanisms are a well-known recycling system. People exchange their waste for a deposit into a saving books or receive money<sup>2)</sup>. For example, in Surabaya, Indonesia in 2011, the waste bank including composting helped reduce waste by 42 Mt. However, only 23.3% households in Eastern Surabaya access the waste bank system in their neighbours<sup>3)</sup>. There are several problems that make it difficult to spread waste bank throughout the country.

The purpose of the research is to improve Indonesian waste banks. The role of stakeholders and waste flow in the waste bank were compared to Japanese community-based waste management systems to identify issues with Indonesian waste banks.

### 2. Research Method

This research mainly focused on waste banks in Surabaya and Malang cities in Indonesia. Both waste banks have developed the fastest in terms of the number of participants compared to other regions in Indonesia. Surabaya is the second largest city in Indonesia with an area of 330 km<sup>2</sup> and a population of 2.9 million in 2017. Waste banks in Surabaya were firstly established in 2010. There were 15 units that year increasing to 180 units in 2013. The area of Malang Municipality is 110 km<sup>2</sup> and the population in 2010 was about 0.8 million. Waste banks were first established in 2011 in Malang, called Bank Sampah Malang (BSM).

For comprehensive results, a literature survey about waste banks and recycling program was conducted in Malang, Surabaya and several municipalities in Japan. There were interviews with waste bank managers/staff and stakeholders.

### 3. Outline of current waste banks in Indonesia

The first waste bank was established in Bantul, Yogyakarta in 2008<sup>6)</sup>. Table 1 shows the outline of current waste banks in Indonesia. In 2012, there were 886 waste banks in Indonesia collecting 2,002 t/month<sup>7)</sup>. The number of total waste banks in Indonesia includes independent waste banks and smaller waste bank units assisted by other larger waste banks. There were 135 and 381 waste banks in Surabaya and Malang, respectively<sup>7)8)</sup>. Figure 1 shows the flow in the waste banks. The members of waste banks separate recyclables from their waste manually and stored at home or in a temporary storage site until collection. The recyclables were transported to the waste banks and weighed. The members receive the revenue as a deposit in their waste bank account book according to the weight and types of recyclables. Typically, plastic, paper, glass and metal are collected as recyclables. The recyclables are sold to recycling

Table 1. Number of Waste Banks in 2012

Name of City	Total Number of		
	Waste Bank	Member **	Waste Collected by waste banks (t/month)
Surabaya	135	1716*	73
Malang	381	19020	77
<b>Total in Indonesia</b>	<b>886</b>	<b>84623</b>	<b>2002</b>

\* in 2015

\*\* Member is households or persons who registered in waste banks

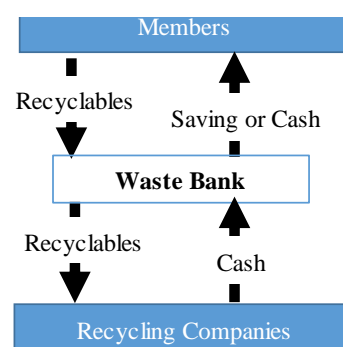


Figure 1. Material flow in the waste bank

companies and some part of recyclables become the source of handcrafted products.

### 4. Results and Discussion

#### 4.1 Benefit of Waste Bank

One of the large benefits of waste bank is the revenue of recovered recyclables as economic values<sup>4)</sup>. The participants take approximately IDR 37,605/month of savings on average<sup>7)</sup>. This price is only 2.3% of the income of average households. However, people can afford to buy small school supplies and raw material for cooking such as chicken, milk, cooking oil, egg, sugar, fish, etc. The economic value would be larger for lower income households. This is one of the reasons that lower economic class households tend to participate in the waste banks.

A second benefit is enhanced social engagement. In Indonesia, there are several organizations consisting of neighbors such as PKK and Karang Taruna. These have had very important roles to maintain local environments and relationships between neighbors. However, membership and participation are declining. For waste bank activity, participants need to discuss regularly the arrangement of the waste bank and the strong social bonds this creates among neighbors.

#### 4.2 Challenges of waste bank

Relatively few participants separate recyclables from their waste. In Malang City, 10-20% of community units

and 40% of school units did not bring recyclable wastes—even if they were members of BSM<sup>5,7)</sup>. The frequency of transportation of recyclable wastes is a reason for inactivity<sup>6)</sup>. The other reason might be the lack of creativity and knowledge about management of administrators who manage waste banks. Administrators can influence the motivation of participants in waste separation. In case of school members, one of the reasons for being an inactive member was no waste storage in schools.

The low participation rate among the total population is another problem. Registered members of BSM were 2% of the total population in 2013<sup>6)</sup>. The amount of waste collected by BSM was only 0.88 percent of the total waste generated in Malang City in 2015. In Surabaya, the waste bank still contributed to a reduction of 0.03 percent of the total waste generated<sup>4,7)</sup>. The survey conducted by Eastern Region of Surabaya reported that a lack of time, laziness, and little knowledge about separation of wastes were the main reasons for low participation in sorting waste at home.

The other challenge is the selling price of recyclable wastes. The prices are determined by the recycling companies and influenced by the import prices of the recyclables. The administrators of waste banks frequently keep the waste until the price becomes high. Waste banks sometimes have to compete with scavengers to obtain recyclables from households. When the prices from the scavengers are higher than that of the waste banks, then participants sell their waste to the scavenger<sup>6)</sup>. Maintaining a high price of recyclables is a challenge that could increase the number of participants.

#### 4.3 Financial conditions of waste banks and Japanese Community Based Waste Management

Generally, the waste banks are supported financially by private companies based on social responsibility of companies (CSR). The government of Indonesia especially encourages large companies to support social and environmental activities as a spirit of CSR. In the case of BSM, the state electricity company (PLN) supported the initial fund. However, the operational cost is managed by BSM from their own profit from selling recyclables. In addition, some waste banks could not pay a sufficiently high salary to the administrators because of higher revenue for households versus selling the material to recycling companies. There are cases where the administrators work as volunteers. According to the Minister of Environment Regulation No. 13 of 2012, a waste bank is defined as a cooperative organization. In Indonesia, cooperative organizations can take financial support only in the form of loans based on Law of Republic of Indonesia No. 17 in 2012. The waste banks cannot take routine support from governments. Malang City supported a waste crusher machine for BSM at the initial stage of establishment of BSM; however, no subsidy was given to BSM for the operation<sup>5)</sup>.

There are several recycling activities in developing countries managed by neighborhood communities. In case of

**Table 2.** Benefits and Challenges of Waste Bank in Indonesia

Benefits
➤ Revenue of recovered recyclables as economic values
➤ Enhancement of social engagement of people
Challenges
➤ Significant percentage of participants were inactive
➤ Low participation rate among population
➤ Keeping high price of recyclables for participants
➤ No subsidy for the operation from governments because of an institutional problem

Japan, CBWM is operated by communities consisting of neighbors and municipalities support this activity financially. Generally, 4 to 8 yen/kg of recovered recyclables are given to the communities. The CBWM collected about 2 million t of resources in 2016, and this amount was 5.41% of all municipal solid waste in Japan. This percentage is significantly higher than the percentage of recovered waste by the waste banks in Indonesia.

Financial support from the government is needed to improve the sustainability and improve Indonesian waste banks. The government receives benefits from waste banks—it collects less waste. Thus, it is appropriate that the governments help the waste bank financially. Regulations about the waste bank organization should be changed to obtain regular subsidies from the government. Support from governments for scavengers to buy recyclable wastes collected by waste banks are needed.

## 5. Conclusion

Waste banks have significant challenges including inactive participants, low participation ratios, fluctuating and low selling prices of recyclable waste, and low operational funds. They need more government support to remain sustainable.

## References

- 1) Gilli, M., Nicolli, F., and Farinelli, P., 2018. Behavioural Attitudes Towards Waste Prevention and Recycling. *Ecological Economics*. 154, 294-305.
- 2) Friedberg, E. and Hilderbrand, M. E., 2017. *Observing Policy-Making in Indonesia*. Singapore: Springer Nature Singapore Pte Ltd.
- 3) Dhokhikah, Y., Trihadiningrum, Y., and Sunaryo, S., 2015. Community Participation in Household Solid Waste Reduction in Surabaya, Indonesia. *Resource, Conservation and Recycling*. 102, 153-162.
- 4) Wulandari, D., Utomo, S.H., and Narmaditya, B. S., 2017. Waste Bank: Waste Management Model in Improving Local Economy. *International Journal of Energy Economics and Policy*, 7(3), 36-41.
- 5) Suryani, 2014. The Significance of Waste Bank in Waste Management Effectiveness (A Case Study of Malang Waste Bank) *Aspirasi* (5) 1, 71-84.
- 6) Dwipasari, L., 2014. Waste Management Model-Based Design Character in Junior High School as a Tool of the Economic Empowerment. *IOSR Journal of Business and Management (IOSR-JBM)*. 16, 38-48.
- 7) Assistant Deputy for Waste Management, 2012. *Profil Bank Sampah Indonesia 2012*, Ministry Environment, Republic of Indonesia.
- 8) Wijayanti, D.R. and Suryani, S, 2015, Waste Bank as Community-based Environmental Governance: A Lesson Learned from Surabaya, *Procedia – Social and Behavioral Science* 184, 171-179.