Community Service Project: Waste Management Through Waste Bank in Pogung, Sleman Regency

Nur Kholis(✉) and Aisyatunnisai Tawakal

Universitas Negeri Yogyakarta, Yogyakarta, Indonesia
nurkholis@uny.ac.id

Abstract. The government established a restriction to community activities (PPKM) due to the Covid-19 pandemic. To maintain economic stability, the restaurant is still allowed to open but taken away only. One of the consequences of this policy is that the number of food wrappers in plastics, bottles, and paper sent to landfills in Pogung, Sleman, Daerah Istimewa Yogyakarta increased significantly. Before the pandemic, less than 1-ton garbage a day was sent to landfills. During pandemics, the garbage can reach 1–2 tons a day. The community service program carried out education and realization of waste management to overcome the problem. This program aims to educate the community about waste bank implementation to reduce solid waste sent to landfills. The methods used in this program are observation, interview, and execution. The data and information used in this paper are collected from the interview, observation, and scientific research paper, and media report. This community service program results in the community being educated about waste management through waste banks and decreasing garbage sent to landfills.

Keywords: Covid-19 · waste management · waste bank

1 Introduction

Universities establish community service programs to implement scientific knowledge. The program is located at Pogung, Sleman Regency, Special Region of Yogyakarta, a regency with 574.82 km^2 area and 1.125.804 population based on the 2020th census. Sleman Regency is located in the north of the Special Region of Yogyakarta. Based on the interview with a stakeholder, many new malls, hotels, and supermarkets are built in this area. This area is located strategically near a well-known university in Indonesia. Pogung is a strategic area in the middle of Jalan Kaliurang, North Ring Road, Jalan Monjali, and adjacent to one of the top universities in Indonesia. This strategic location makes Pogung has many immigrants from students who live in dormitories or boarding houses. This area has many narrow streets that can only be passed by one car or even one motorbike. Moreover, there are many laundry services, restaurants, and dormitories around this area.

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The COVID-19 pandemic has caused a global crisis and led to waste management issues [1]. The waste generation growth in Indonesia has reached 64 million tons in 2015 and shown an increasing trend over time. This issue occurs because of the people's habits in handling waste by disposing it into open sewage or disposal without sorting organic and inorganic waste with no further processing [2]. According to the interviews with stakeholders in Sleman Regency, community restriction based on the Covid-19 pandemic has drastically increased garbage. Waste Bank is a campaign to overcome the problems with the the waste by buying back and properly saving money from the banking system's waste. After that, the observation was carried out for three days due to the large area in Pogung, and some areas can not be accessed due to the community restriction policy. This area has many alleys, and most of them are still closed due to restriction policy. There are many food stalls, laundry services, print shops, and cafes in this area.

Waste Bank grows to almost every city and regency in Indonesia to manage waste problems [3]. It accepts **recyclables** such as **PET** bottles, **newspapers**, magazines, books, plastic bags, **cardboard boxes**, office paper, **electric** wires, aluminum cans, **iron** cans, and **worn-out shoes** from **customers** [4]. In addition, Purba et al. [5] argued that this waste bank **will** also **help** local governments to **empower communities** to manage **the** waste wisely and reduce **the amount of** waste **sent** to final disposal.

The waste bank management is almost similar to the commercial bank, where customer's deposit is money in commercial bank, customer's deposit is waste in waste bank. To boost income and entrepreneurial spirit, the management is required to be creative and innovative. Therefore to receive more economic benefits, it is also associated with the local community to collect and manage waste.

This community service aims to educate the community about waste management through a waste bank. The targets are community in RW 50, Pogung, Sleman, Daerah Istimewa Yogyakarta.

2 Discussion

This study is descriptive qualitative research to describe the waste bank as a model of managing waste to improve the economy of the community. The data is collected through in-depth interviews, questionnaires, and close observation. The location of this research is in Sleman, Daerah Istimewa Yogyakarta.

Open dumping and burning waste has been a common practices in the waste management in Indonesian community [5]. The interview result with Pak Wasid as a stakeholder in Pogung indicates that the amount of waste sent to dumping ground during pandemic increased significantly. Before the pandemic, there was only less than 1 ton of garbage sent to the dumping ground. Meanwhile, the pandemic can reach more than 2 tons a day. It can cause an environmental problem due to the lack of waste management.

Krisnani et al. (2017) stated that the lack of a waste management system is a severe problem in almost the Indonesian government. Moreover, in this pandemic era, garbage increases significantly due to the lack of food wrappers consumed by the community. The increasing volume of the garbage was not balanced with the waste management program [5]. Addressed to this condition, a student and lecture from Universitas Negeri

Yogyakarta executed a community service program named waste bank management through a waste bank in Sleman, Yogyakarta. This program was conducted in July 2021, when the community restriction still exists.

The interview was conducted on September, 25th 2021, with Mr. Pur as one of Pogung's stakeholders called lurah in Indonesia. Based on this interview, the community in Pogung had started their daily activities with many restrictions due to health protocol. Restaurants are closed due to government policy but can accept the order if the meals are wrapped. The following interview was conducted with Mr. Wasid as another stakeholder in Pogung called the head of RW in Indonesia. Another effect arising from this pandemic is that plastic wrapper garbage increases drastically because all food must be wrapped in plastic, bottles, or paper. Moreover, many restaurants still use disposable plastic.

Based on an interview with Mr. Pur as the village head in Pogung, the people of Pogung had started their activities while still paying attention to the Health protocol. The food stalls are still closed due to restriction policy and can accept orders wrapped with single-use plastics. Our hyper-hygienic way of life during the pandemic increased the demand for plastic packaged food and groceries. These plastics contribute to around 60–95% of plastic marine pollution globally [6].

The following interview was conducted with Mr. Wasit as the head of the RW in Pogung. He stated that because it was still in the PPKM period, many people were just at home. Most of the people are also getting bored. Another effect of this PPKM is that single used waste increases drastically because all food purchased must be wrapped in plastic, bottles, or paper.

Furthermore, an interview was conducted with Mrs. Muzna as the manager of the Waste Bank in Pogung. From this interview, it was concluded that the condition of PPKM contributes to the waste problem in Pogung. Previously, the waste was only under 1 ton per day. During the PPKM period, it became 1–2 tons per day. In addition, because all community activities are limited, the activities of the waste bank have also stopped.

To educate people about waste management, the communities organize a webinar. In the Indonesian context, waste management mandated in Law No. 18 of 2008 stated that the 3R Model (Reduce, Reuse, Recycle) is an alternative solution to solve the waste problem. Raising public awareness of waste management through local community using waste bank will help to contribute solving waste problems [7]. The Ministry of the Environment has implemented various strategies to maximize the effectiveness of the 3R program. One of them is the Waste Bank, a way to turn waste into economical benefits that can be enjoyed by local community.

This webinar lasted for 2 h and 30 min, starting with the opening by the village head, the hamlet head, and the head of RW 50, and continued with waste management materials by the speakers. After that, there was a question and answer session which lasted for 30 min. In this session, five people asked questions.

The first question was from Mr. Paryanto, the head of RT 07, regarding the reasons for not being allowed to burn plastic. The speaker answered this question regarding the danger of burning plastic waste because plastic is made of chemicals, and if it is burned, then pollution containing gases that are carcinogenic/cancer-triggering will be inhaled by humans. This effect is not in the short term but will be felt when a person is getting old.

The second question was from Mrs. Maryati from the head of RW 50, regarding how to manage waste sustainably so that the community can actively participate consistently. The speaker's answer was to involve all components, especially the stakeholder. For example, the RW heads are active in the waste bank by making regulations requiring the community to become members of the waste bank or cooperate with institutions such as schools to implement the waste bank. Moreover, solid waste management could be more effective by maintaining public-private partnership [8].

Then the last question from Mr. Roman Makalalag, a resident of RT 09, regarding the technical waste collection. The answer from the speaker is that the community must have a place to sort out temporary waste in their respective homes, which has been differentiated based on the type of waste. Only when it has been collected a lot, then it is compiled into the waste bank.

A week after the waste management webinar was held, a waste bank was held with a gathering point at SD Negeri Sinduadi. This place was chosen because it is spacious and close to the main Pogung road. In addition, the storage warehouse is also located in front of this elementary school, making it easier when transferring the collected waste.

The implementation of the waste bank started at 08.00 WIB by preparing scales, stationery, and equipment. The implementation of this activity is carried out while still implementing strict health protocols. Because of the restriction policy, garbage is collected from people's homes using motorbikes. People who collect their garbage will share the location of their homes with the WhatsApp group and then wait for the waste bank implementer to visit, which in this case are PPM students. However, we also allow people who want to collect their waste directly to the location, provided they comply with the health protocol.

We make sure waste collected has been sorted according to its type and considerations for further data. The types of waste collected are plastic waste, bottles, paper, cardboard, glass, iron, and used cooking oil. We also receive waste cooking oil to process it into the soap in the future. During the implementation of this waste bank, it is collected as shown in Table 1.

After completing the data collection, all waste is transported to a temporary waste storage area located in front of SD Sinduadi. Transportation is carried out with the help of motor vehicles due to the large amount of waste that must be transported.

3 Conclusion

In this pandemic era, garbage increases significantly due to the lack of food wrappers consumed by the community in Pogung, Sleman Regency. The community service program carried out education and realization of waste management to overcome the problem. After realizing the webinar and implementation of the waste bank, the community is educated about waste management through the waste bank.

Table 1. Waste Collection Result

No.	Types of Garbage	Amount (kg)
1	Cardboard	32.2
2	Duplex	40.1
3	Plastic bags	7.9
4	Plastic bottles	10.4
5	Hardness	8.6
6	Files	65.9
7	Glass bottles	5
8	Used clothes	144.7
9	Cans	3.5
10	Glass	6.5
11	Iron	3.2
12	Mix	8.1
13	Paper	11.9
14	Shoes	10.9

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