

## Cultivating Change: A Community-driven Approach to Organic Waste in Padukuhan Nglebeng

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### ABSTRACT

Household waste is the main contributor to organic waste. Improper management of organic waste can have negative environmental consequences. In Padukuhan Nglebeng, the lack of knowledge among the community, especially housewives, about the dangers and benefits of household waste has led to the accumulation of unprocessed waste in disposal sites. To address this issue, an outreach program was conducted, focusing on enhancing the community's understanding and awareness of the environmental impact of organic waste. The program included four stages: observation, socialization, practical application, and evaluation. Initially, the participants had limited knowledge about organic waste, scoring an average of 63% in the "insufficient" category. However, after the socialization session, their knowledge significantly improved, particularly regarding the dangers and benefits of organic waste, composting, and the composting process. Among the participants, 56% showed interest in implementing the acquired knowledge, while 44% still had concerns related to complexity and aversion. The socialization activities were successful overall. It is recommended to replicate this composting method in different locations to achieve the "Bantul Zero Waste 2025" initiative.

**Keywords:** Household waste; Organic waste, Padukuhan Nglebeng; Composting; "Bantul Zero Waste 2025" initiative.

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## INTRODUCTION

The increasing and rapid population growth results in the expansion and density of residential areas. One of the problems caused by the high population increase is the increase in waste. The larger the population with various activities carried out, the greater the amount of waste that will be generated (Febria & Rahayu, 2021). The issue of waste is closely related to the lifestyle and culture of the society itself. Therefore, waste management is not only the government's responsibility, but its handling requires broad participation from the community (Sahil et al., 2016).

Waste is the byproduct of human activities that contains various toxic substances such as heavy metals and insecticides (Pandebesie et al., 2019). Broadly speaking, waste can be classified into two types: organic waste, which includes leaves and food scraps, and inorganic waste, which includes plastic waste (Mawaddah & Putra, 2022). Both types of waste have benefits for society if properly managed but can also trigger various environmental problems if mishandled (Cundari et al., 2019), such as unpleasant odor, aesthetic disturbance, flooding, environmental sanitation deterioration, and the emergence of various diseases (Phan Hoang & Kato, 2020).

Organic waste constitutes the largest proportion of daily waste generation, with organic waste accounting for 60%, and plastic waste reaching 15% (Ramadhani et al., 2021), where household waste is the largest contributor to organic waste (SIPSN, 2021). This is because many Indonesian citizens are still unaware of the dangers and benefits of discarded waste (SIPSN, 2021). where household waste is the largest contributor to organic waste (SIPSN, 2021). This is because many Indonesian citizens are still unaware of the dangers and benefits of discarded waste (BPS, 2017), including the community in Padukuhan Nglebeng, Tamanan Village, Banguntapan District, Bantul Regency.

Based on the observations and field surveys conducted by the community service team to the residents around Padukuhan, it was found that the lack of knowledge among residents regarding the dangers and benefits of household waste leads to unprocessed waste piling up in the landfill. The majority of the community still considers all waste as dirty and needs to be disposed of or burned (Khair et al., 2015), the waste generated from each household in Padukuhan Nglebeng is collected individually and then transported as a whole to a temporary waste disposal site. Subsequently, using larger vehicles, household waste is dumped at the final disposal site.

Many steps have been taken by the government to reduce the amount of waste generated. However, the volume of waste generated each day often exceeds the volume that can be reduced and processed (Budihardjo & Wahyuningrum, 2018), and there is limited land available for disposal. Therefore, efforts to reduce waste at its source are needed, focusing on the implementation of the principles of reduce, reuse, recycle, and replant (4R) to lessen the burden on final disposal sites. As expressed by (Hidayati et al., 2021), if every household takes responsibility for the waste they produce by managing or recycling it, it will reduce the accumulation of waste in landfills.

Composting is one alternative household waste management system that can be used to recycle organic materials into useful products. This process is considered the most efficient, environmentally friendly, and agronomic, as compost can be used as soil conditioner, organic fertilizer, and contains high nutrient content for the soil (Rama & Vasanthy, 2014). Additionally,

it can be utilized to control the increase of waste (Kadir et al., 2016), as the raw material for making compost is waste, thereby addressing household waste issues (Febria & Rahayu, 2021).

Research conducted by (Kadir et al., 2016; Wang et al., 2022) has shown that pure composting carried out using organic waste materials has been significantly proven to reduce household waste volume and provide a solution for agriculture as a substitute for chemical fertilizers. Household-level composting has several advantages, such as readily available raw materials and a simple and easy process. The resulting compost can be used as a growing medium for plants in home gardens or organic vegetable gardens. However, the success of utilizing organic household waste as compost material depends on the understanding of family members in the composting process.

Taking into account the issues mentioned above, it is necessary to conduct knowledge transfer activities to the community as part of community service activities aimed at: 1) enhancing public understanding of the dangers and benefits of household organic waste, 2) providing knowledge to the community on how to process household organic waste into compost, and 3) improving the availability of compost and composters in the community. These activities are expected to become one of the solutions to address household waste management issues in Bantul Regency towards "Bantul Zero Waste 2025".

## METHODS

The community service activities in the form of socialization and practice of household waste processing into compost in Padukuhan Nglebeng, Tamanan Village, Banguntapan Sub-district, Bantul Regency involve the residents of Padukuhan, especially the housewives. The implementation method of the activities consists of four stages:

### *Stage of Observation and Survey*

Based on the observations and surveys conducted by the community service team to the residents around Padukuhan Nglebeng, it was found that the lack of knowledge among the residents regarding the dangers and benefits of household waste resulted in unprocessed waste piling up at the disposal site. The majority of the residents still consider all waste as dirty and to be disposed.

### *Stage of Socialization*

The socialization activity took place on Thursday, October 20th, 2022, at PAUD Pelangi in Padukuhan Nglebeng, Tamanan Village, Banguntapan Sub-district, Bantul Regency, Yogyakarta Special Region. The socialization materials were presented by the community service team. The materials were delivered using slides and live video presentations to facilitate the understanding of the community. The purpose of the socialization was to provide a platform for discussion between the community service team and the community, emphasizing that household waste, when disposed of in the environment, can cause pollution. Therefore, the community needs guidance to increase their knowledge about the potential of household waste being turned into compost as plant fertilizer.

### *Stage of Compost Making Practice*

After the completion of the socialization stage, the next step is the hands-on practice of compost making by the participants, guided by the community service team. It is expected that after this activity, the participants' knowledge and skills in independently managing the household waste they produce will be enhanced. The tools and materials used for the compost making practice include buckets, knives, solder, scissors, pipe glue, water taps, and household organic waste (such as leftover rice washing water, fruit peels, vegetable scraps, and the like). Two

buckets (17 liters), a tap, a cutting grinder, a drilling machine, and used plastic bottles (with a volume of 1500 ml) are used.

### *Stage of Evaluation*

The evaluation stage is aimed at measuring the extent to which an activity can be considered successful or not. In this activity, the evaluation stage involves discussions and questioning the participants about the outcomes of the provided socialization materials.

## RESULTS AND DISCUSSION

In the initial stage, the community service team conducted observations and surveys to observe and gather information about the issues faced by the community in Padukuhan Nglebeng. Based on these observations and surveys, it was found that the residents' knowledge regarding the dangers and benefits of household waste was still very low, resulting in unprocessed waste piling up at the landfill. This issue prompted the community service team to organize socialization activities and compost-making practices using organic waste, targeting housewives in the Padukuhan Nglebeng area, Tamanan Village, Banguntapan Sub-district, Bantul.



**Figure 1:** Compost Socialization Activity

The socialization was held on October 20, 2022, at the PAUD Lestari building in Padukuhan Nglebeng, Tamanan Village, Banguntapan Sub-district, Bantul. The activity was attended by 16 participants from households of RT 001 to RT 007 in Padukuhan Nglebeng, mainly consisting of housewives. The material was presented by the community service team. Prior to the presentation, the presenter inquired the socialization participants about the hazards of organic waste, the benefits of organic waste, and composting methods, with the aim of assessing their initial knowledge as shown in Table 1. Throughout the socialization session, the participants exhibited high enthusiasm, which was evident from the multitude of questions and discussions that took place. One participant voiced the primary challenge in organic waste processing, which includes the fear of worms, aversion to odors, and other factors. Therefore, to address this issue, it is necessary to change the participants' paradigm that food waste processing is only 50% disgusting, unlike animal waste.

**Table 1.** Initial Knowledge Results of Participants in the Socialization

Knowledge	Frequency	Percentage	Category
Organic waste hazards	10 People	63%	Not Good
	6 People	37%	Good
Benefits of organic waste	12 People	75%	Not Good
	2 People	25%	Good
About compost	15 People	94%	Not Good
	1 People	6%	Good

Waste processing is about how to dispose of all unwanted materials into agriculture. Composting is a sustainable waste processing practice that transforms accumulated volumes of organic waste into usable products. When organic waste is decomposed by microorganisms in an environment that generates heat, the waste volume decreases, harmful organisms are destroyed, and it produces useful products with potential for marketing. Compost making requires several main materials and tools. The required materials include household organic waste consisting of fruit waste such as banana peels, papaya peels, and watermelon rinds, as well as vegetable waste such as leftover vegetables like mustard greens, spinach, cassava leaves, and water spinach. The tools used include 2 buckets (17 liters), a tap, a cutting grinder, a drilling machine, and used plastic bottles (with a volume of 1500 ml) (Mangera & Ekowati, 2022).

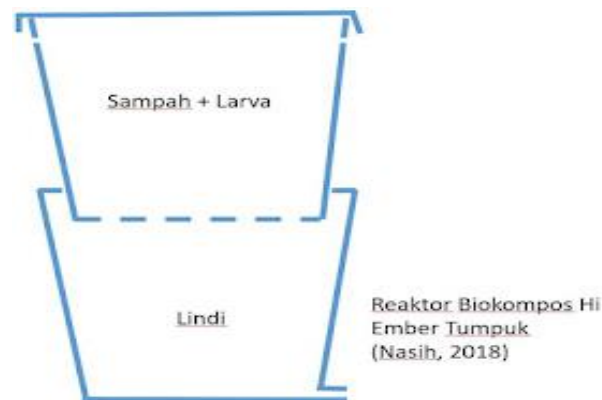
**Figure 2:** Compost Making Materials

After the completion of the household waste processing socialization materials, the practical phase of compost making followed. During this practice, the participants of the socialization were accompanied by the community service team. The composting method utilized was the layering bucket method (Syadik et al., 2021). The layering bucket method involves combining two buckets to create a direct composting system. This method is considered simple as it utilizes household materials, making it easily applicable at home. With the layering bucket method, each household can effortlessly produce organic fertilizer by utilizing the waste they generate, thus aiding in restoring deteriorating soil fertility.



**Figure 3:** Compost Making Practice

In the compost making practice, several composting buckets have been prepared. The composting bucket (Figure 4) consists of two main components: **The bottom bucket:** The bottom bucket serves to collect the leachate from the decomposition process. A tap is installed on the lower side of the bottom bucket, and its lid securely attaches to the upper bucket for easier retrieval of the leachate. **The top bucket:** The top bucket functions as a storage container for compost raw materials. Small drainage holes are made at the bottom of the top bucket, and there are small holes on the upper side beneath the lid (Ekawati et al., 2021).



**Figure 4:** Compost Bucket

The composting process using the layering bucket method involves four stages (Syadik et al., 2021). **First**, organic household waste is placed in the bucket regularly without the need for chopping or cleaning. Then, the bucket is tightly closed. The warm and moist conditions inside the bucket promote the rapid growth of indigenous microorganisms from household waste. **Second**, for two months, the leachate produced is allowed to remain in the bottom bucket. After that, it can proceed to the maturation process to become Liquid Organic Fertilizer (LOF). The maturation process is carried out by opening the tap, transferring some of the leachate into a clear bottle or using a jerrycan, loosening the lid, and then exposing it to the heat of the sun until its color turns dark brown and has a mild aroma. **Third**, the matured Liquid Organic Fertilizer (LOF)

can be used by diluting it with approximately three tablespoons (three bottle caps) in 1 liter of water. LOF can also be stored in drums without an expiration date for future use. **Fourth**, compost harvesting can be done periodically (Yuwono, 2016). To use it directly, the compost can be drained and sieved beforehand.

The final stage of this composting socialization and mentoring activity is the evaluation stage. The evaluation stage is conducted through discussions and inquiries with the participants regarding the outcomes of the socialization materials provided. On average, the participants were able to correctly answer the questions related to the socialization materials. Additionally, some participants also expressed interest in implementing household organic waste sorting through composting methods at home. The evaluation results are presented in Table 2.

**Table 2.** Participants' Knowledge Results After the Socialization

Knowledge	Frequency	Percentage	Category
Understanding the dangers of organic waste	16 People	100%	Good
	0 People	0%	Not Good
Understanding the benefits of organic waste	16 People	100%	Good
	0 People	0%	Not Good
Understanding compost and the manufacturing process	14 People	88%	Good
	2 People	12%	Not Good
Interest in implementing the knowledge	9 People	56%	Yes
	7 People	44%	Not Yet

Overall, this socialization activity was successfully conducted, as indicated by the increased knowledge and awareness of the participants regarding household organic waste and its benefits. Additionally, 9 participants showed interest in implementing the knowledge of organic waste management using composting methods in their respective homes, while others still chose to use waste disposal services due to reasons such as complexity, disgust, and others. After completing the entire series of activities, the socialization and assistance program was concluded with a group photo session between the community service team and the presenter.



**Figure 5:** Group photo with the community service team and the presenter

## CONCLUSION

The community service initiative aimed to educate the residents of Padukuhan Nglebeng, Tamanan Village, Banguntapan Subdistrict, Bantul Regency about the dangers and benefits of household waste and promote composting as a solution. The activities included socialization sessions and practical demonstrations, primarily targeting housewives from RT 01 to RT 07. The success of the socialization was evident in the participants' enthusiastic engagement and their ability to answer questions effectively. Out of the participants, 9 individuals expressed their interest in implementing composting methods to process organic waste at home, while others preferred waste transportation services due to concerns about the perceived complexity and aversion associated with composting. The socialization program is expected to serve as a solution in addressing the challenges of waste management in Bantul Regency and contribute towards the realization of the "Bantul Zero Waste 2025" initiative.

It is recommended to continue this community service program in different locations in the future to support environmental sustainability and further advance towards the vision of "Bantul Zero Waste 2025."

### Thank-you note

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