



## Financial Analysis of Independent Waste Management as a Solution to Overcome Waste Problems in Yogyakarta City

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**Abstract.** This article discusses independent waste management as a solution following the closure of the Piyungan Final Disposal Site (TPA) in Yogyakarta. The study was conducted in RW Minomartani, which successfully developed an independent waste management system. The results show that this model is feasible financially, socially, and environmentally. With monthly revenue of IDR 3,200,000 and expenditures of IDR 2,500,000, there is a surplus of IDR 700,000 that can recover the initial investment within approximately 10 months. In addition, the program strengthens community cooperation, creates job opportunities, and reduces environmental pollution.

**Keywords:** Waste Management, Environmental Accounting, Waste

### INTRODUCTION

Yogyakarta, as one of the most popular tourist destinations in Indonesia and known as a student city, attracts not only tourists but also students from various regions who come to pursue their education. As a result, the Special Region of Yogyakarta holds a significant responsibility in ensuring the sustainability of a clean and healthy environment. Due to the high birth rate and migration from surrounding areas, Yogyakarta is experiencing rapid population growth.

Yogyakarta is currently facing a serious waste management problem. The amount of waste generated daily continues to increase, while its waste management infrastructure remains inadequate. Waste from three regions Yogyakarta City, Bantul, and Sleman—has been disposed of at a single Final Disposal Site (TPA), namely TPA Piyungan. However, due to overcapacity, TPA Piyungan was officially closed on May 1, 2024.

The closure of TPA Piyungan has had a major impact on waste management across the Special Region of Yogyakarta, particularly in the urban areas. In several waste depots, such as Pengok Depot, there has been significant waste buildup, causing unpleasant scenery and posing environmental and public health risks.

This waste issue has even drawn the attention of the Minister of Environment/Head of the Environmental Control Agency (BPLH), Hanif Faisal Nurofiq, who expressed his frustration after observing the waste piles at the Mandala Krida Temporary Waste Disposal Site (TPS) and reportedly reprimanded the Governor of Yogyakarta regarding this matter. (1)

Yogyakarta City, being the smallest in land area compared to other regencies in the province, faces an enormous challenge, particularly due to its limited land and high daily waste volume, reaching 200 tons per day. Residents often find it difficult to dispose of their waste. In response, the city government through the Environmental Office (DLH) of Yogyakarta City has prepared several strategic initiatives. One such effort includes the establishment of Integrated Waste Processing Sites (TPST) in several subdistricts (kemantren), such as Karangmiri, Nitikan, and Kranggan. Another example is TPST Kupas, a waste processing business owned by BUMDES Panggungharjo, which processes both household and other types of waste using dedicated equipment.

The city government has allocated funds to purchase waste processing equipment for these TPSTs. However, their processing capacities still fall short of the daily waste volume. For instance, TPST Karangmiri can only handle about 40 tons per day, Nitikan 30 tons, and Kranggon 20 tons (4). This means that a significant portion of the city's waste remains unmanaged. As an alternative, the government has also urged the public to take part in independent waste management efforts.

Several communities in Yogyakarta have already implemented independent waste processing solutions to cope with the closure of TPA Piyungan. The Environmental Office of Yogyakarta Province (DLH DIY) designated 10 pilot villages for community-based waste reduction and management initiatives. These villages aim to demonstrate that waste can be managed at the kelurahan (sub-district) level without relying on TPAs. One of the pilot areas is Minomartani Village (5). In these areas, waste is sorted at the household level. Organic waste is composted, while unsorted inorganic waste is incinerated using small-scale, low-emission incinerators.

One notable pilot area is RT 17 RW 08 Minomartani, which produces approximately 250 kg of waste daily. Prior to the closure of TPA Piyungan, residents paid a monthly fee of IDR 40,000, which was used to pay the salaries of waste collectors. These collectors transported household waste to depots, which in turn used part of the fee to cover transportation and disposal costs to TPA Piyungan.

After the closure, RT 17 RW 08 Minomartani shifted to fully independent waste management. Residents developed a low-smoke waste incinerator, also known locally as a *"tobong"*, which not only burns waste but also produces ash that can be used as fertilizer. The guiding principle is that all household waste must be processed and incinerated within the same day, ensuring that no residual waste remains. Before burning, waste is sorted at the household level into organic and inorganic materials. Organic waste is composted, while non-recyclable inorganic waste is incinerated using the *tobong*. The smoke produced during incineration is neutralized with a spray, thus minimizing air pollution.

Based on the above, the author seeks to provide a solution to the waste accumulation problem in Yogyakarta City following the closure of TPA Piyungan. This study takes inspiration from communities that have successfully implemented independent waste management systems. RT 17 RW 08 Minomartani serves as the case study for this research, as it has managed to process waste independently without relying on TPAs.

To achieve this, the author conducted observations, interviews, and questionnaire surveys to identify the stages of independent waste processing and to analyze the financial/accounting aspects of the waste management system. The goal is to develop a replicable model that can be adopted by other communities in Yogyakarta, helping the city reduce its dependence on central waste disposal facilities and move toward a cleaner and more livable urban environment.

## **RESEARCH METHOD**

This study uses a qualitative approach. The main goal is to understand the mechanisms of independent waste management, accounting records, and its impacts on the community. Data were collected through field observations, interviews with the RW leader, waste workers, the designer of the incinerator, as well as several residents, and documentation such as financial records and equipment construction documents.

Data analysis was carried out through data reduction, data presentation, and conclusion drawing. To ensure validity, triangulation was applied by comparing interview data with observations and written documents. This method ensures that the results are reliable and reflect actual conditions in the field.

## **RESULTS AND DISCUSSION**

RW Minomartani consists of 150 households. Each household is required to pay a monthly contribution of IDR 20,000, totaling IDR 3,000,000. With the addition of approximately IDR 200,000 from the sale of recyclable inorganic waste, total revenue reaches IDR 3,200,000 per month.

Expenditures include IDR 1,500,000 for workers' honorarium, IDR 500,000 for fuel and transportation, IDR 300,000 for equipment maintenance, and IDR 200,000 for reserve funds, totaling IDR

2,500,000. This leaves a surplus of IDR 700,000 per month, or IDR 8,400,000 per year, which is sufficient to repay the initial investment of IDR 7,000,000 in about 10 months.

The operational mechanism begins at the household level with waste collection. Organic waste is processed into compost, recyclable inorganic waste is sold, while residual waste is incinerated. Ash from organic waste incineration can be used as fertilizer, while residual ash is disposed of at the TPA. This innovation ensures that daily waste is eliminated without accumulation, preventing environmental pollution.

The social impacts include improved discipline in paying contributions, greater awareness of waste sorting, and stronger community cooperation. The economic impacts include sustainable financial management and the creation of jobs for waste workers. From an environmental perspective, illegal dumping has been significantly reduced, pollution risks have decreased, and dependence on the TPA has been eliminated. This shows that independent waste management provides sustainable multidimensional benefits.

## **CONCLUSION**

This study concludes that independent waste management in RW Minomartani is feasible in financial, social, and environmental terms. A simple contribution system, combined with waste sorting and the use of a low-smoke incinerator, can generate financial surplus, create jobs, and reduce environmental pollution.

This success can serve as a model for other communities in Yogyakarta City and other regions facing similar problems. For further development, it is recommended that the city government support such initiatives with training, technical assistance, and proper regulation.

## **RECOMMENDATIONS**

1. Residents should develop the habit of waste sorting at the household level to facilitate management.
2. Local governments should support this model through regulations and facilities so it can be replicated.
3. Continuous training should be provided for waste management workers to ensure effectiveness.
4. Combining this system with other recycling technologies could increase economic value and environmental benefits.
5. Further research is needed to evaluate the long-term impacts of this system.

## **ACKNOWLEDGMENTS**

This article is based on research supported by an internal grant from the Institute for Research and Community Service (LPPM), Universitas Respati Yogyakarta. The authors would like to thank the residents of RW Minomartani for their collaboration and all parties who supported the implementation of this research.

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