



Utilization of Rekosistem Waste Station in Efforts to Manage Inorganic Waste in the Open University

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Abstract

Waste production continues to rise, with South Tangerang recording 369,177.50 tons in 2023. Managing such large volumes of waste is challenging, especially when done independently. Universitas Terbuka (UT) has supported environmental efforts through its UT Go Green initiative since 2010, but its inorganic waste management, particularly at the Faculty of Teacher Training and Education (FKIP UT), remains suboptimal. This study explores the potential of collaborating with Rekosistem, a waste management platform, to enhance inorganic waste handling at UT. Conducted over three months (September–November 2024), the research used a quantitative approach focusing on inorganic plastic waste. Data were analyzed descriptively and presented in tables and charts. Waste management at FKIP UT followed a sort, package, and drop system. One drop-off was conducted at the Rekosistem waste station located at Hero Supermarket, Lebak Bulus, resulting in the delivery of 2.65 kg of inorganic waste. Compared to the total 5-day waste volume of 28.7 kg, this contribution was still small. However, the results show that the Rekosistem waste station can be a viable option for reducing inorganic waste in the workplace and may serve as a model for broader implementation at UT.

Keywords: Inorganic waste, Rekosistem, Waste Station, Waste Management, Open University

1. Introduction

Waste production is increasing every day (Bagaskara, 2021). The waste comes from household waste, industry and other sectors. In 2021, global waste production reached 3 billion tons (Hidayat, 2021). In 2023, waste accumulation from 321 districts/cities throughout Indonesia reached 35,518,824.02 tons/year. In the city of South Tangerang, in 2023 the annual waste accumulation reached 369,177.50 tons (SIPSN, 2023). The increase in the human population plays a very large role in the increase in the amount of waste because each individual throws away waste without caring where the waste will end up. Based on data from the Ministry of Environment and Forestry in 2022, 65.83% of waste in Indonesia is still transported and dumped in landfills (KLHK, 2023).

Resolving the waste problem is not an easy problem (Larasati and Fitria, 2020; Adeniran, 2022; Ogundele et al., 2018). Based on the National Waste Management Information System (SIPSN) Data from the Ministry of Environment and Forestry (KLHK) in 2023, of the total national waste production of 35.5 million tons, there is 37.09% of waste that has not been managed properly (SIPSN, 2023). This waste management process will be difficult if carried out independently, especially if the volume of waste is very large. Therefore, integrated and holistic collaboration is needed between the community and several parties, such as the waste management



community. Traditional waste management, such as dump-collect-transport must be abandoned and replaced with the 3R pattern (reduce, reuse, recycle) (Mahartin, 2023; Farizal, 2017; Fan et al., 2019).

Rekosistem is a startup company that provides waste management and recycling services for inorganic waste (KTH-Humas UNPAR, 2024; Kompas, 2023; Siagian, 2022). The system of this Rekosistem is to provide waste stations in certain places, then the community deposits their waste to be managed by Rekosistem. In 2023, Rekosistem managed a total of 35 thousand tons of organic waste. This number has increased from the previous year, by 84.2% (Nely, 2024). The involvement of the Rekosistem in waste management in Indonesia is very necessary so that the public's negative view of waste can change (Budiono et al., 2023).

As an educational institution, UT has committed to participating in overcoming environmental problems through the UT Go Green movement since 2010. Through UT Go Green, it is hoped that there will be a change in attitude for UT residents to behave Go Green in carrying out their daily duties. In addition to responding to the ongoing issue of climate change, the UT green program is a manifestation of implementing programs that are oriented towards the Sustainable Development Goals (SDGs), as stated in the UTGU Strategic Plan (Renstra) 2022-2025 (UT, 2024).

The inorganic waste management system at UT has not been carried out optimally. Although there has been an appeal to bring tumblers and reduce the use of plastic, the provision of food wrapped in plastic at seminar events at UT is still maintained. In addition, inorganic waste processing has not been carried out optimally even though trash bins are available, even based on the opinion of FKIP lecturers, mostly people still see inappropriate waste disposal actions (such as mixing organic, inorganic and B3) in the work environment.

To demonstrate UT's commitment to environmental sustainability and accelerate the implementation of UTGU programs that are oriented towards SDGs which are also part of the realization of UT as a World Class University (WCU), cooperation is needed with various external parties of UT, one of which is Rekosistem. Therefore, through this research, that UT can become a pioneer in utilizing Rekosistem waste station facilities to manage waste in the UT central work environment.

2. Research Method

The research was conducted at the Faculty of Teacher Training and Education, Universitas Terbuka (FKIP UT), South Tangerang for a period of 3 months, from September 2024 to November 2024, starting from preparation to report arrangement. The research design uses quantitative methods with observation and questionnaire techniques. The following is the research flow.



Preparation

- 1. Trial of Rekosistem application
- 2. Create flyers with waste management info
- 3. Prepare questionnaires
- 4. Prepare tools and materials

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Implementation

- 1. Socialize sorting-packaging-depositing waste to FKIP UT lecturers (distribute flyers)
- 2. Coordinate with cleaning staff at FKIP
- 3. Collect and sort waste
- 4. Package waste
- 5. Weigh waste
- 6. Deliver waste to Rekosistem waste station

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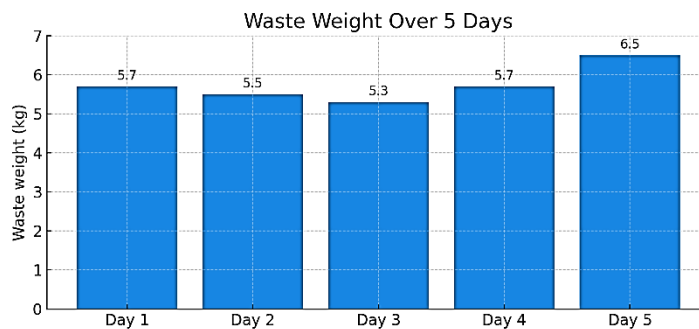
Research Publication

- 1. Collect data
- 2. Analyze data
- 3. Prepare report
- 4. Seminar

The sample in this study was inorganic plastic waste. The data collected came from primary and secondary data. Primary data was obtained by calculating the total daily waste and the amount of inorganic waste that had been delivered to the waste station. Interviews with several informants were conducted to obtain secondary data. The data obtained were then analyzed using descriptive statistics, with data presentation in the form of tables and diagrams.

3. Results and Discussions

This research focuses on waste management in the FKIP UT, especially on the 4th floor. In this area, occupied by lecturers from 12 Departments, FKIP UT. The number of staffs on the 4th floor area are around 125 people. The number of FKIP UT academicians will affect the amount of waste produced. The calculation of the amount of waste has been carried out and this data was recorded every working day for 1 week (5 days) at the end of October 2024. The total daily amount of waste can be seen in Graph 1.

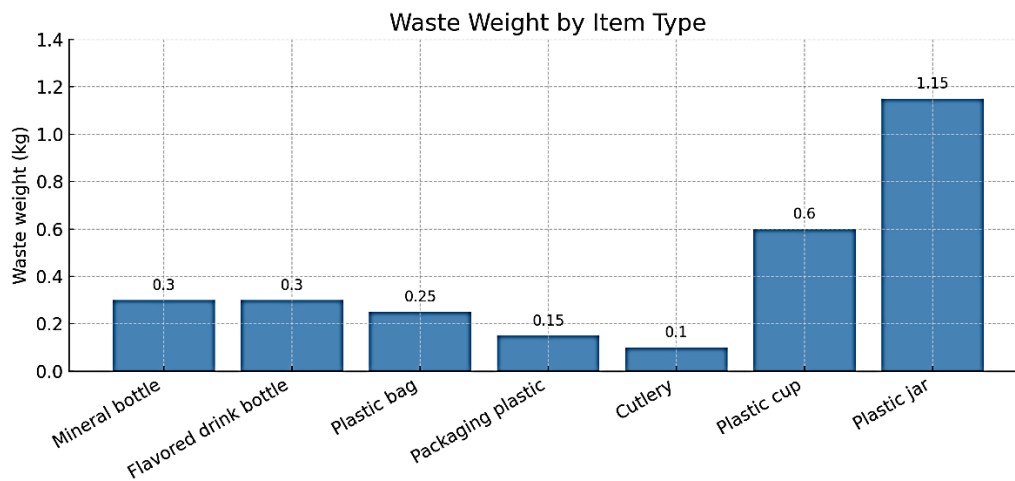


Graph 1. Total Daily Waste



The total amount of waste in the FKIP UT tends to fluctuate although it is not significantly different. This depends on the activities carried out by the teaching staff every day. This is in accordance with the research of Edjabou et al. (2015) that the number of people and activities affect the amount of waste produced. On Fridays, the amount of daily waste reaches the highest amount. The reason is not yet known for sure, but it may be related to Friday Blessings which encourages individuals to share food with each other (Edjabou et al., 2015).

The waste listed in the data above is a combination of organic and inorganic waste, which has not gone through a sorting process. The waste collection process is carried out twice a day, in the morning and evening, then sent to the TPS located in front of the UT Central Campus. If we look at the data above, the total waste collected for 5 days reached 28.7 kg. This means that each individual produces an average of 0.2 kg of waste per week. In addition to recording the total amount of waste, sorting and weighing of inorganic waste were also carried out. The inorganic waste that was successfully collected for 1 week can be seen in Graph 2.



Graph 2. Weight of Inorganic Waste Sent to The Rekosistem Waste Station

Based on Graph 2, the types of inorganic waste that were successfully sorted were diverse, namely mineral bottles, flavored drinking bottles, plastic bags, plastic packaging, plastic cutlery, plastic cups and plastic jars. From the seven types of inorganic waste collected, plastic jars and cups were the most waste produced by FKIP lecturers.

This result differs from the information obtained from Rekosistem officers, where the most waste received from the general public was plastic drinking bottles. This difference is caused by lecturers at FKIP already having a high awareness of using their own tumblers.

These wastes need attention, by following the 3R management method because plastic-related products are a significant threat to the environment as they contribute to global temperature rise. Based on research conducted by Sharma et al., (2023) greenhouse gas emissions during the



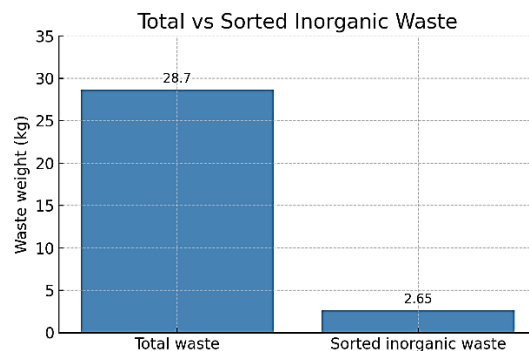
plastic production process contribute to increasing global temperatures, even in 2050 high plastic production have a major impact on increasing global carbon by 13% (Sharma et al., 2023).

The presence of Rekosistem is a new breakthrough that needs to be utilized optimally, especially by academics in the Higher Education environment, where Higher Education plays a role as a producer of competitive human resources so that it is required to become an agent of change. An ideal university must be creative and innovative in responding to the various problems it faces.

Unfortunately, the utilization of the Rekosistem waste station is still low. This is evidenced by the fact that not many people have utilized the Rekosistem service, as well as most lecturers at FKIP UT. In addition, more than 50% of FKIP lecturers have never used the waste bank service outside the office. In fact, the use of Rekosistem is relatively easy, just download the Rekosistem application for free and follow the instructions in it.

Currently Rekosistem does not accept all types of waste, but the types of inorganic waste processed by Rekosistem are quite a lot, not only some plastic waste, but also paper waste, some glass waste, metal and electronic devices. Interestingly, Rekosistem also processes used cooking oil. After packaging, the waste was sent to the Rekosistem waste station closest to UT, which is located in Hero, Lebak Bulus. The waste that was successfully recorded by Rekosistem was 2.65 kg. According to information obtained from Rekosistem workers, the waste received from the community will be sent to the warehouse in advance and then distributed to recycling facilities.

The effectiveness of the use of the Rekosistem waste station in managing inorganic waste at FKIP UT was seen from the comparison of the amount of waste sent to the waste station and the amount of waste transported to the TPS. Through Graph 3, we can see the comparison of them.



Graph 3. Comparison of Total Waste and Inorganic Waste Sent to The Waste Station Rekosistem

When viewed from the comparison between the total daily waste and the inorganic waste that has been sorted, the inorganic waste sent to the waste station is still very little. This is due to



several factors, namely lack of information, inadequate waste facilities and lack of awareness from oneself and colleagues. Therefore, waste management at FKIP UT is still far from effective. As the research was carried out, researchers encountered various obstacles. Some of these obstacles were time limitation, lacking coordination with cleaning staff and lack of awareness of staff in the waste drop process.

4. Conclusion

Waste management at FKIP UT has been carried out using the sorting, packaging and drop method. Dropping of waste have been carried out once, at the Rekosistem waste station located at Hero Supermarket, Lebak Bulus. The amount of inorganic waste that was successfully delivered was 2.65 kg. When compared with the total waste for 5 days, which is 28.7 kg, the number of waste deposited was still very small. However, the Rekosistem waste station has been proven can be utilized for reducing inorganic waste in the work environment.

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