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DOMESTIC WASTE MANAGEMENT PLANNING AT PLN (PERSERO) UPK LOMBOK ULPLTD PAOKMOTONG: 3R PROGRRM APPROACH

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Abstract: Effective and sustainable domestic waste management is essential for PT PLN (Persero) UPK Lombok ULPLTD Paokmotong. In facing environmental challenges and increasingly stringent regulatory demands, this company needs to carry out domestic waste management planning based on waste generation and composition. This study aimed to determine waste management planning with the 3R program at ULPLTD Paokmotong. The research method in this study is descriptive qualitative with data collection techniques: interview methods, surveys, and measurements of domestic waste generation and composition at PT PLN (Persero) UPK Lombok ULPLTD Paokmotong. The results of this study indicate that TPS 3R at ULPLTD Paokmotong serves 61 employees. Based on the type of waste, the proposed waste management strategy, namely implementing the 3R program at PT PLN (Persero) UPK Lombok ULPLTD Paokmotong, has proven effective in reducing waste generation and optimizing resource use. Through waste reduction efforts at the source, reuse of recyclable materials, and efficient recycling processes, companies can reduce environmental impacts and generate sustainable economic benefits. Based on the planning of waste containers that must be provided by ULPLTD Paokmotong of 3.14 liters, placed in each building and distinguished by the type of waste, namely organic, inorganic, and B3. With an organic waste volume of 18 L / day with a compostable waste capacity of 14.4 L / day. Meanwhile, in implementing the 3R program based on the calculation results, the total volume of composting produced is 540 L / month. The total number of composter drums that must be prepared is seven pieces. As for residual waste, it has a volume of 4 L / day with a container capacity of 28 L and an inorganic waste storage area of 2 m3 with a length of 2 m, width of 1 m, and height of 1 m. The suggestion in this study is that it is hoped that the next researcher will add the Draft Budget for the construction of TPS 3R and the DED of the TPS 3R building.

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Keywords: *Waste, Waste Management, 3R Program.*

INTRODUCTION

PT PLN (Persero) Lombok Generation Implementation Unit is one of the largest electricity supply companies on Lombok Island, with various types of power plants spread throughout all corners of Lombok Island. One of the power plants at the eastern tip of Lombok is ULPLTD Paokmotong [1]. Managers of residential, commercial, industrial, special, public, and other areas must provide area-scale processing facilities in TPS 3R [2].

So far, waste processing at ULPLTD Paok Cut still uses conventional storage, transport, and disposal patterns. For waste storage at ULPTD Paokmotong, a segregated container system, namely organic, inorganic, and B3 waste, has been implemented. In contrast, for the collection system by cleaning staff, the container used is plastic waste by combining the sorted waste into one plastic container and taking it to the TPS [3]. The waste generated from the source cannot be fully organized in each room's rubbish bins, so sometimes some waste is not sorted. In waste management, ULPLTD Paokmotong has implemented the 3R program in which organic debris (leaves) is processed into compost; however, the implementation of the 3R program carried out by ULPLTD Paok Cut is not yet completely perfect [4]. At the ULPLTD Paok cut, the waste management stage is carried out by implementing the 3R program, namely limiting waste generation, recycling, and reusing waste [5].

3R waste processing (Reduce, Reuse, Recycle) is a market-based method of handling and reducing waste that is not B3 waste (Toxic and Hazardous Materials), reprocessing, reducing, and reusing. The new paradigm of the 3R approach (Reduce, Reuse, Recycle) considers that the remaining results of human activities can still be used again, either directly or requiring processing so that any objects or goods thrown into the environment still have use value [6].

Based on the background above, the author considers it necessary to plan domestic waste management based on waste generation and composition at PT PLN (PERSERO) UPK LOMBOK ULPLTD Paokmotong on an ongoing basis by implementing the 3R (Reduce, Reuse and Recycle) program. The waste management planning in question is a waste handling scheme and processing program, so the expected result is that waste management at ULPLTD Paok Cut can be better in the future and have a positive impact on

the environment by implementing the 3R (Reduce, Reuse, Recycle) method on an ongoing basis.

RESEARCH METHODS

This type of research is included in qualitative descriptive research with observations of existing conditions and the results of previous research regarding domestic waste management planning based on waste generation and composition at PT. PLN (Persero) UPK Lombok ULPLTD Paok cut continuously implements the 3R (Reduce, Reuse, and Recycle) program, which shows that there are still many weaknesses in handling waste management technically and materially. Therefore, a better alternative management system is needed to reduce the volume of waste brought to final disposal sites (TPA) [7].

The analysis area in this research is PT PLN (Persero) Lombok Generation Implementation Unit ULPLTD Paok Cut, which is administratively located in Paok Cut Village, Jalan Tgh M. Kholidi, Paokmotong, Kec. Mas Bagik, District. East Lombok, West Nusa Tenggara Province. Meanwhile, geographically, it is located at the position 08º 37.30' - 08º 38'S and 116º 27.30' - 116º 28' East Longitude. The administrative areas that limit the scope around ULPLTD Paokmotong are: To the north, it is adjacent to Sudirman Gardens. The west side is adjacent to the Hallway; to the south, it is adjacent to Sahudin Gardens; and to the east, it is adjacent to Jl. Paok Cut Department - Padamara

Figure 1 Location Sampling

Based on the aims and objectives of this research, namely to formulate a Domestic waste management plan based on the generation and composition of waste at PT PLN (Persero) UPK Lombok ULPLTD Paokmotong on an ongoing basis with the implementation of the 3R program [8]. So, several stages of analysis will be carried out, namely, direct observation at the research location, conducting interviews, measuring waste generation and composition using sampling techniques based on SNI 19-3694-1994 regarding waste collection and measurement methods, and determining the optimization or handling of domestic waste management at ULPLTD 3R based [9].

RESEARCH RESULTS AND DISCUSSION

Existing conditions regarding waste management

The following are the existing conditions regarding waste management implemented in the Paokmotong ULPLTD environment:

a) Source and container
ULPLTD Paokmotong waste sources consist primarily of building waste: the Office and Control Room, Kitchen, Workshop, Power Plant Building, Security Post, and Yard. The storage provided is in the form of plastic trash cans and implements 14 separate organic and inorganic trash cans with a capacity of 240 liters; for the office, there are five trash cans with a total of 20 liters; for the kitchen, there is one trash can with a capacity of 20 liters and control room 3 trash cans with a capacity of 40 liters.

b) Types of waste
In general, the types of waste produced by ULPLTD Paokmotong are organic waste (leaves or twigs and food waste) and inorganic waste (paper, plastic, bottles, glass, styrofoam, and LED lights).

c) Waste Collection

ULPLTD Paokmotong waste collection system in general is that waste that has been separated from the source when collected by the cleaning staff which will be taken to the TPS, is organized into one organic and inorganic waste; this happens because the cleaning staff, when collecting waste from the source only bring one trash bin and due to a lack of knowledge and collection standards for officers regarding good and correct waste management.

d) Waste Transportation
The ULPLTD Paokmotong waste transportation system uses 240L trash cans, where the waste is collected from the source, and waste transportation officers regularly come to transport the trash cans using Bumdes transport cars with a transportation frequency of once a week, namely on Wednesdays.

e) Waste Management
The waste management referred to in this research is Waste Management by PLN ULPLTD Paokmotong. Based on the research results, the author describes interviews with informants based on their positions.

Results of Measurement of Waste Generation and Composition

The location designated as the sampling location is the total waste from all buildings at ULPLTD Paokmotong. Waste measurements are done in the afternoon by collecting waste from all facilities in one container. Waste is measured and sorted in the backyard of the Paok Cut ULPLTD building because it is a strategic location for the designated waste collection.

Waste measurement begins by measuring the daily waste generation by weighing the weight of the waste in the plastic waste collected together. After the importance of the piled waste is weighed, the next stage is measuring the composition of the trash by taking one box of samples of the collected waste and then sorting the waste based on the type and components of the waste that have been determined [10]. These components include food waste, leaves, paper, plastic, bottles, sawdust, B3, and others. The following are the results of measurements of ULPLTD Paokmotong waste generation in mass units (Kg) for 8 working days:

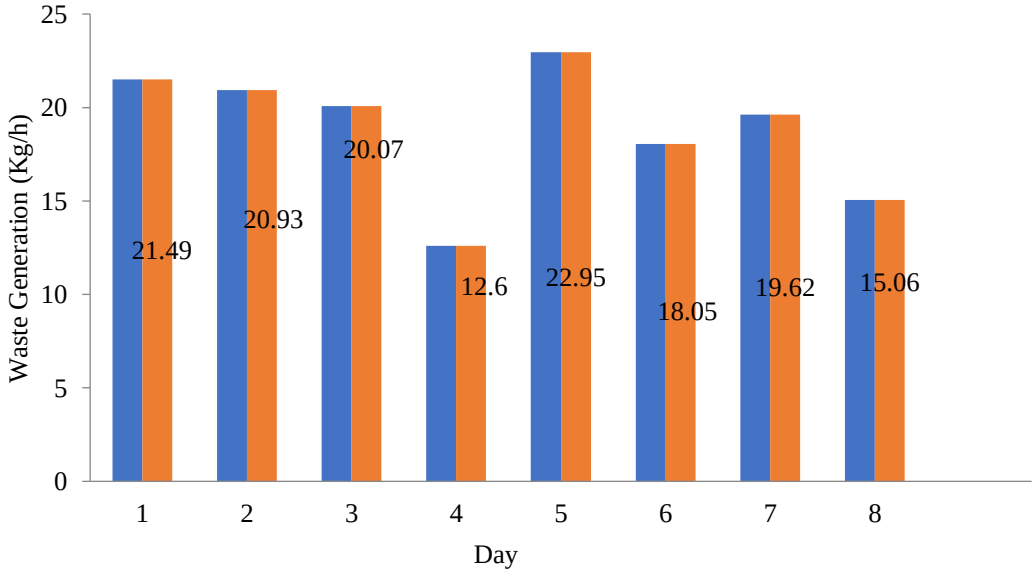

Figure 2 Waste Generation UPLTD Paokmotong

The waste generation rate can be determined based on the results of measurements and processing of waste generation data [11]. The following is the waste generation rate at ULPLTD Paokmotong in units of kg/m3/day and liters/m3/day.

Table 1 Waste Generation Rate ULPLTD Paokmotong

ULPLTD Paokmotong	Total (org)	Waste Generation	
		Kg/org/day	Liter/org/day
	61	0.31	0.31

3R TPS Planning

3R TPS planning started with the container. In the initial stage of waste management at sources originating from building, kitchen, and yard waste, separate containers are carried out. Each source.[12] These three types of waste have the

same characteristics, organic and inorganic waste, except for road waste, which has a more dominant organic variety [13].

Furthermore, waste collection is carried out by collecting waste starting from the container or trash can from the source to TPS 3R ULPLTD Paok cut. The collection process is carried out by cleaning staff who collect rubbish in rubbish bins in each building and carry out rubbish collection bins based on the type of rubbish on the street. Garbage collection is carried out twice, namely in the morning, around 09.00 WITA; after the cleaning staff do cleaning such as mopping, sweeping, etc., the second collection is carried out in the afternoon, around 17.00 WITA.

Furthermore, the management of the waste brought to TPS 3R will be processed and produced as a product in the form of compost, plastic pellets, waste sold to collectors, and residue. The waste that has been collected will be moved to a temporary disposal site (TPS) located behind the PLN ULPLTD Paokmotong office. The process of transporting waste at the PLN ULPLTD Paok Cut TPS is the responsibility of BUMDES Paokmotong Village. Debris from the TPS is transported to the TPA in Masbagik District using a 4 m3 capacity garbage truck. Transportation is carried out at 07.00 WITA or 17.00 WITA, where the frequency of the carrier is once a week, namely on Wednesdays.

With good waste management, the remaining waste that is not used is only ±10%. [14] This activity will reduce waste transportation costs for area managers, reduce the area required for TPS locations, and reduce the waste problem currently faced by many local governments [15].

Managers of residential areas, commercial areas, industrial areas, particular areas, public facilities, social facilities, and other facilities are required to provide area-scale processing facilities in the form of TPS 3R [16].

One very effective waste management technique is the 3R method, which focuses on reducing, reusing, and recycling and aims to reduce the amount of waste that must be processed directly at the landfill. Waste management using the 3R method sorts waste into organic and inorganic.[17] Organic waste is processed biologically, while non-organic waste is recycled for economic value or handled in waste banks. Processing products such as waste recycling, solid compost, liquid compost, and bioethanol, which are by-products of 3R processing [18].

The basic paradigm of waste processing is from collection, transportation, and disposal to reuse, reduction, and recycling[19]. Smart, efficient, and programmable. This shows the importance of managing waste properly and correctly [20].

CONCLUSION

The average volume of all waste generated at ULPLTD Paok Cut is 18.85 L/day, weighing 18.85 kg/day. With a waste generation rate of 0.31 kg/person/day and 0.30 liters/person/day, the waste composition of Paok Cut ULPLTD consists of 93.08% dry leaves and twigs waste, 3.35% glass waste, 1.81% paper waste, 0.97% plastic waste, 0.76% LED light waste, 0.03% Styrofoam waste, and 0% food waste. 3R (Reduce, Reuse, Recycle) Waste Processing Site (TPS) serves 61 ULPLTD Paok cut employees. The management carried out at TPS 3R consists of Reducing the use of styrofoam and plastic as food and drink containers, Asking employees to provide reusable food utensils, Reducing the use of single-use plastic and replacing it with materials that are readily decomposed or can be reused, Use a mineral water dispenser, Use food containers (large plates), to reduce the use of boxes or cardboard for a meeting, Using refill printer ink instead of replacing the cartridge, if the printer ink runs out, recheck the text before printing and avoid printing unimportant documents and Reduce printing of meeting materials by sending meeting materials via electronic mail and in digital form. Reuse: Use food and drink containers that can be used repeatedly, such as Tumblers and Recycle. Process organic waste (leaves) into compost.

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