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**Landfill Waste Management Effort in
Simomulyo Health Center Work Areas**

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ABSTRACT

The waste generation in Surabaya is up to 650,614.62 tons/year and the waste that has been managed is around 639,275.49 tons/year. Some of the work area in Simomulyo Health Center consists of 3 villages with a population up to 79,522. Population density is one of the causes of waste generation are scattered and produced an unpleasant odor on some Landfills in Simomulyo Health Center work areas. The purpose of this study is to evaluate the efforts of waste management on waste disposal sites in Simomulyo Health Center work areas.

This research is a qualitative descriptive study with the variables consist of sorting/containing, collecting, transferring, transporting, processing, final processing to the waste generation. The data were collected with observation, interviews and measurements, then the data were analyzed using the SWOT matrix and described using UU RI number 18 of 2008 and SNI 19-2454-2002 of 2002 for the reference.

Simo Rukun landfill had the most waste generation than the other landfill in Simomulyo Health Center work areas that up to 28,714 kg. The highest inorganic waste characteristics at 52.1% is in the Sukomanunggal landfill while Simo Rukun Landfill had the highest organic waste characteristics at 54.2%. Landfill waste management in Simomulyo Health Center work areas was declared not fulfill the requirements of UU RI number 18 of 2008 and SNI 19-2454-2002.

The results of the SWOT analysis represent that Simo Hilir landfill entered the third quadrant (turn around) while Simo Rukun and Sukomanunggal landfill entered first quadrant (Aggressive). It is recommended for the waste management in Simomulyo Health Center work areas to fulfill those 2 regulations.

Keywords: Temporary Disposal Site, Waste Management

BACKGROUND

Solid waste can pollute or damages the environment, includes river, lakes, the sea, the land also the air quality. Therefore, it is necessary to have well waste management system. Besides that, it can also be the spot for vectors development that cause diseases such as diarrhea, dysentery, cholera and dengue. Diarrheal diseases based on Simomulyo Health Center Profile in 2021 is up to 13,858 cases, upper respiratory tract infection up to 96,440 cases also dermatitis is 11,688 cases.

Work areas in Simomulyo Health Center consists of 3 sub-districts which are Simomulyo, Simomulyo Baru, Sukomanunggal with population 79,522 recorded by Surabaya Population and Civil Registration Office as of January 26, 2020(statistika, 2020).

The condition of 3 landfills during the preliminary survey on November 27, 2021, if it rains it will flood with waste scattered on the road. Waste disposal sites in Simomulyo Health Center work areas contains waste that accumulates and produces unpleasant odor, as proven by 25 samples taken during preliminary survey, as much as 72% or equivalent to 18 samples concluded that landfills in Simomulyo Village caused a pungent odor while passing through, transporting waste to the landfill in the morning or afternoon with dump trucks caused traffic jams at the landfill location, due to the non-strategic location which on the side of the road. There were 28% or equivalent to 7 samples who said that only landfill were not neatly organized and the waste from other urban villages was not thrown into it containers and caused it to be scattered all the time.

Waste management has not been suitable with environmental friendly concept methods and techniques so far, resulting in negative impacts on public health and the environment. So far, some people still seeing waste as useless waste, not as a resource that can be used. The community still relies on the “end of pipe” approach, which are collecting, transporting, and disposing to the final waste processing site.(Fajariyah, 2020).

RESEARCH METHODS

This type of research is a qualitative descriptive study, to make a description (descriptive) Simomulyo Health Center work areas waste management efforts in Surabaya through the SWOT analysis method. The object of this research is the volume and the composition of waste based on SNI 19-3964-1995 and waste management includes sorting/containing, collecting, transporting, processing and final processing of waste.

The types of data are primary and secondary data, the instruments used for data collection in this study are observation sheets, interview sheets, and measurement sheets. Data collection techniques is a strategy to obtain data to answer questions. Obtaining data information for the benefit of the authors, also the techniques that were used such as interviews, observations, measurements and documentation.

Processing and analyzing data in this study using editing, scoring and coding with a value calculation of >35 declared eligible, <34 declared ineligible. In the SWOT analysis method, the researcher uses IFAS and EFAS and then determines quadrants, furthermore the data is processed by tabulating and describing data analysis by comparing the UU RI Number 18 of 2008 on Waste Processing and SNI 19-2954-2002.

RESULTS AND DISCUSSION

1. Waste Generation

In the results of the measurement of waste generation for 7 consecutive days from the 3 landfills, concluded some significant differences, the difference is because the amount of people served by each landfill is different and it also affects the policies of each village differently. Collecting data in Simomulyo Health Center work areas landfill using SNI 19-

3964-1995 regarding methods of collecting and measuring waste generation and composition of urban waste (Mustikasari, 2017).

It can be seen in the table 1 that the prediction of waste generation for the next few years is increasing, affected by several internal and external factors which can be seen below:

- a. Total population and growth rate
- b. The higher the community living standard, the higher the waste generation
- c. Lifestyle and population mobility

Table 1
Average waste generation in Simomulyo Health Center work area landfills 2022

Landfill	Amount of Neighborhood Association Served by Landfill	Average amount (Kg)
Simo Hilir Landfill (Simomulyo Baru)	12	14.825
Simo Rukun Landfill (Simomulyo)	25	28.714
Sukomanunggal Landfill (Sukomanunggal)	16	16.057

By knowing number of population, also waste generation flow it can be predicted for the next 5 to 10 years within the following formula:

Waste generation : Waste generation flow x inhabitant

Table 2
Prediction of waste generation in the next 3 years

Landfill	Total Population in 2020 (inhabitant)	Total Population in 2021 (inhabitant)	Percentage of increase each year	Waste generation in 2021 (Kg)	Waste generation in 2022 (Kg)	Waste Generation in 2023 (Kg)	Waste Generation in 2024 (Kg)
	1	2	3 (2-1x100%)	4	5 (3x4)	6 (3x5)	7 (3x6)
Simo Rukun Landfill	24.108	24.475	1,5%	5.950.850	6.040.112	6.130.714	6.222.675
Simo	43.244	43.769	1,2%	2.028.720	2.059.151	2.090.038	2.121.388

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Sukomanu nggal Landfill	11.120	11.278	1,4%	3.639.070	3.693.656	3.749.061	3.805.296
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2. Garbage Composition

Garbage composition is a description of each component contained in the waste and its distribution. The most frequent grouping of waste is based on its composition which is expressed in kilogram(Herumurti, 2017).

Garbage composition is divided into 2, such as organic and inorganic waste. The organic waste consists of vegetable waste, leaves or food waste and the composition of inorganic waste consists of cans, plastic and others(Bagastyo, 2022).

This is the following of average result of the measurement of waste generation on organic and inorganic waste with a period of 7 days in each landfill in Simomulyo Health Center work areas with a waste system that has the generation measured which will be sorted into inorganic waste (bottles, cardboard, cans, etc.) weighed, the waste that is still in the cart is organic waste (Widyawati, 2020).

Average amount of waste generation composition in landfills in Simomulyo Health Center work areas

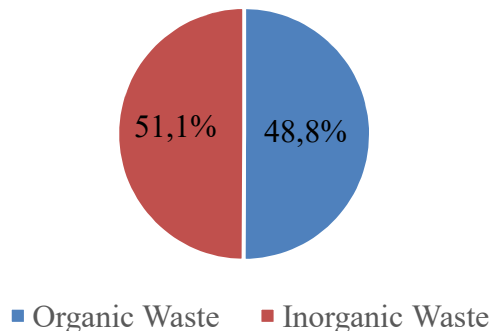


Image 1
Average Amount of Waste Generation

3. Waste Management Effort

This evaluation is using observation and interviews method with the officer in charge of the landfill which was held on 26 May 2022. The observation and interview sheets used referred to the UU RI Number 18 of 2008 waste management and SNI 19-2454-2002 concerning Operational Engineering Procedures. Urban Waste Management in waste management(Tarigan, 2019).

a. Simo Rukun Landfill

It was found in Simo Rukun landfill that they did not implement waste management in accordance with UU RI 18 of 2008 concerning waste management

and SNI 19-2454-2002 of 2002 on Engineering Operational Procedures for Urban Waste Management. Waste management at Simo Rukun landfill is included in the "Not Eligible" category with a percentage of 63% getting a score of 26 from a maximum score of 70 due to not fulfill the landfill regulation, facilities and infrastructure to classify waste according to the characteristics is unavailable, the placement disturbs aesthetics and traffic, and there is no transportation or collection scheduling.

b. Simo Hilir Landfill

It was found in Simo Hilir landfill, that they did not implement waste management in accordance with UU RI 18 of 2008 on concerning waste management and SNI 19-2454-2002 of 2002 on Engineering Operational Procedures for Urban Waste Management. Waste management on Simo Hilir landfill is included in the "Not Eligible" category with a percentage of 60% of the score of 27 from a maximum score of 70. The most points not fulfill the requirements are waste processing points due not managing waste and directly distributing to the landfill. As for not fulfill the applicable landfill regulations, the location in residence appear to be difficult to transport waste, facilities and infrastructure to classify waste according to the characteristics is unavailable.

Table 3
Waste Management on Simo Rukun Landfill

No	Variable	Result	
		Yes	No
1	Waste Containing/ Sorting	4	9
2	Waste Collecting	6	8
3	Waste Transporting	8	6
4	Waste Processing	3	12
5	Final Waste Processing	5	9
Total		26	44
Percentage		37%	63%

Table 4
Waste Management on Simo Hilir Landfill

No	Variable	Result	
		Yes	No
1	Waste Containing/ Sorting	7	6
2	Waste Collecting	5	9
3	Waste Transporting	7	7

No	Variable	Result	
		Yes	No
4	Waste Processing	3	12
5	Final Waste Processing	6	8
Total		27	42
Precentage		40%	60%

c. Sukomanunggal Landfill

Waste management on Sukomanunggal landfill is included in the "Not Eligible" category with a 50% percentage of the score of 35 out of a maximum score of 70 is said to be ineligible due to no facilities to classify waste according to the characteristics of the waste, and location is not cleaned after the waste is transported to the landfill, the absence of scheduling for transporting waste to the landfill.

Table 5
Waste Management on Sukomanunggal Landfill

No	Variable	Result	
		Yes	No
1	Waste Containing/ Sorting	6	7
2	Waste Collecting	8	6
3	Waste Transporting	8	6
4	Waste Processing	4	11
5	Final Waste Processing	9	5
Total		35	35
Precentage		50%	50%

4. SWOT analysis on each landfill in Simomulyo Health Center work areas

a. Simo Rukun Landfill

The results of the SWOT analysis in Simo Rukun landfill, with the results of quadrant I Aggressive, which shows that improvements in various fields, improvement of weakness factors to maximize the usage of opportunities with benefits that have been described with a lot of organic waste as a compost house.

b. Simo Hilir Landfill

In chapter 4, the results of the SWOT analysis with the results of quadrant III Turn Around are reversing negative tendencies and most commonly focused on management which has been explained by the amount of inorganic waste that can be recycled or sold.

c. Sukomanunggal Landfill

In chapter 4, the results of the SWOT analysis with the results of Quadrant I Aggressive, which shows that improvements in various fields, improvement of weakness factors to maximize the use of opportunities with the benefits that have been described with waste containers can be replaced with appropriate trash bins for easy sorting (Mutia arda, 2020).

CONCLUSION AND RECOMMENDATION

1. Conclusion

Waste management efforts Simomulyo Health Center work area landfill which include sorting/containing, collecting, transporting, processing, final processing of waste on 3 landfills were observed not in accordance with SNI 19-2454-2002 and UU RI no 18 of 2008. SWOT analysis result at Simomulyo Health Center work area landfills showed a different relative, on Simo Hilir landfill in quadrant III, which is turn around, which means that the waste collection cart should be replaced with a closed wagon so waste and leachate does not spill out, on Simo Rukun landfill and Sukomanunggal landfill in quadrant I, it is aggressive, which means improving the management of waste transportation to the landfill and improving landfill sanitation so that they do not become vector breeding spot.

2. Recommendation

For the Health Center to provide more advice through counseling or distributing leaflets to sort waste from the source of waste. The Surabaya Environmental Office can be used as a reference in efforts to managing waste in Simomulyo Health Center work area landfills.

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