ANALYSIS AND MAPPING OF TEMPORARY SHELTERS (CASE STUDY: JAMBI LUAR KOTA SUBDISTRICT, MUARO JAMBI REGENCY)

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ABSTRACT

Background: *The population of Jambi Luar Kota Subdistrict in 2020 is 62.687 people, with the development of an increasing population, it will affect the increase in the amount of waste scattered in illegal locations, so it is increasingly necessary to improve the availability of Temporary Waste Shelters.*

Objective: *The purpose of this study was to analyze and to map temporary waste shelters in Jambi Luar Kota Subdistrict, Muaro Jambi Regency..*

Method: *Descriptive research with the results of mapping temporary waste shelters based on Global Positioning System and Geographic Information System, data using total sampling in Jambi Luar Kota Subdistrict. The data analysis used is descriptive analysis and is presented in the form of output in the form of maps and tabulation of data.*

Results: *The results showed that in Jambi Luar Kota Sub-district there were 36 illegal temporary waste shelters, almost all with a waste volume of 1-49 m3 (91.67%), most of them were located near neighborhood roads (77.78%), and most of them were at medium and high population density levels (80.56%). Furthermore, according to SNI 19-2454-2002, the minimum standard is 167 legal temporary waste containers.*

Conclution: *The minimum standard for temporary waste shelters in the Jambi Luar Kota Subdistrict is 167 points, which can be mapped based on population density figures and qualified land availability.*

Keywords: *analysis, mapping, temporary waste shelters*

INTRODUCTION

The population growth rate in an area will have a direct or indirect impact on the level of community needs in various aspects of life, the more demand it will raise new problems, or old problems that are not resolved, such as the increasingly numerous and complex waste problems, especially in developing countries such as Indonesia. Both by number, type, and volume of waste will continue to increase in proportion to the rate of population growth and increased use of various technologies and socio-economic activities in the community. Waste is the remnants of daily human activities in the form of a solid, this is in accordance with the definition expressed in the Waste Management Law No. 18 of 2008, can be in the form of organic, inorganic, and hazardous and toxic waste.[1,2]

Improper waste collection and processing methods will increasingly have an impact on environmental conditions that become dirty and irregular, environmental pollution occurs which is harmful to humans and ecosystems, becomes a chain of disease transmission, air pollution occurs as a result of the process of burning waste or the existence of long-term waste piles, pollution of ground and surface water, damage to the beauty of the environment, and will produce unpleasant odors. Nationally, the waste problem has become a major problem and has been prioritized to find solutions for many years, both by government agencies, private institutions, and non-governmental organizations. One of the first factors that can be improved is how to regulate the pattern of temporary waste shelters in the community. A sufficient number of temporary waste shelters must be available to accommodate the increasing amount of waste every day. If there are not enough temporary waste shelters, it will result in the practice of dumping waste in the wrong place (illegal temporary waste shelters).[3]

Geographic information system is a computer-based system that can handle geo-referenced data, which consists of entering data, managing data, manipulating and analyzing data, and producing an output that can then be used as a reference in decision making. At present, GIS is growing rapidly and has been applied to every aspect of life, such as education, environment, health, geography, and so on. If implemented in the aspect of waste problems, then GIS plays a role in mapping the location of temporary waste shelters that can be accessed quickly, easily, and accurately.[4,5,6]

Muaro Jambi Regency is one of the regencies located in Jambi Province with an area of 5,246 km2 which has eleven sub-districts, one of which is Jambi Luar Kota Subdistrict. Recorded in 2021, Jambi Luar Kota Subdistrict consists of 20 villages, 53 hamlets and 272 RTs. The population of Jambi Luar Kota Subdistrict in 2020 was recorded at 62,687 people, consisting of a male population of 32,087 people and a female population of 30,600 people. With the increase in population development that continues to increase, it will definitely affect the increase in the amount of waste generation. So it is increasingly necessary to have a waste management pattern including related to temporary waste shelters.[7,8]

The results of observations in Mendalo Darat Village, Jambi Luar Kota District, some people still tend to have the habit of disposing of waste not in temporary waste shelters. This can be proven by the fact that there are still many people who dispose of garbage around the house yard, on the edge of the ditch, on the side of the road to burn garbage, and it was found that there were at least 4 (four) illegal temporary waste shelters. To facilitate the relevant agencies in solving waste problems, especially at the illegal temporary waste

shelters, it is necessary to obtain information in the form of geographical and demographic mapping that can be used as a reference in decision making with relevant stakeholders on how to improve the pattern of distribution/mapping of temporary waste shelters in Jambi Luar Kota Subdistrict in accordance with the level of need and affordability for the wider community both in terms of quantity and feasibility.

METHOD

This research is a descriptive study and is in the form of mapping temporary waste shelters based on Global Positioning System and Geographic Information System data. This research was conducted in the area of Jambi Luar Kota Subdistrict, Muaro Jambi Regency. The Indonesian Landform Map of Jambi Luar Kota Subdistrict was used as the basis for determining the area. The data collection method uses the census method which is found directly during field observations, then analyzed descriptively and presented in the form of output in the form of maps and data tabulations.

RESULT

The area of Jambi Outer City Subdistrict is 507.24 km2 or 50,724 ha with a population of 69,835 people. From the results of the survey that has been carried out, 36 temporary waste shelter locations were obtained, all of which have the status of illegal temporary waste shelters and are on vacant land with a total volume of 658.8 m3 of waste spread across all urban villages in Jambi Outer City Subdistrict, namely 17 points in Simpang Sungai Duren Village, 12 points in Mendalo Darat Village, 4 points in Sembubuk Village, 1 point in Simpang Limo Village, and 2 points in Sungai Bertam Village.

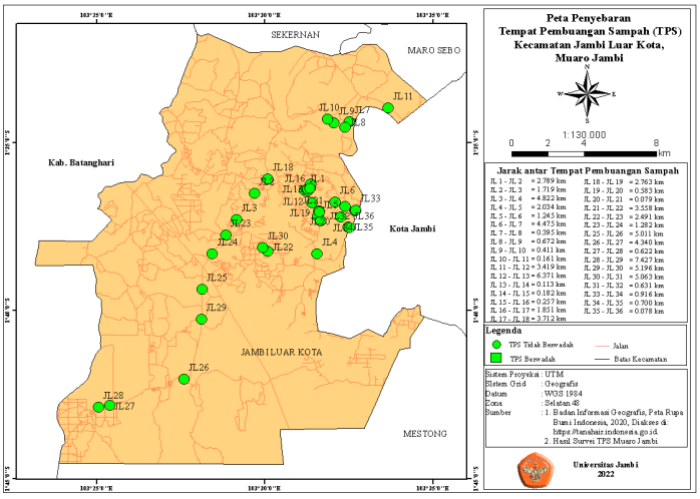

Figure 1. Location Map of Illegal Temporary Waste Shelters in Jambi Luar Kota Subdistrict

Source: Researcher, 2022

The closest distance between temporary waste shelters is 78 meters and the farthest distance is 4.34 kilometers. All of these locations have no containers (100%), almost all are easily muddy (97.22%), some still take the sidewalk (8.33%), some still disturb road users (11.11%), some are not on the edge of a large road so it is difficult to transport (2.78%), and some are still on the edge of a ravine (2.78%)

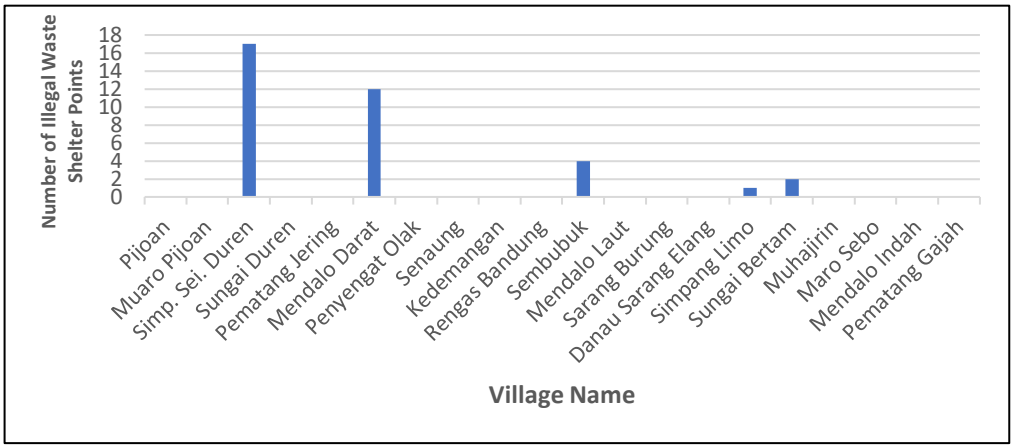

Figure 2. Histogram of the Number of Points of Location of Illegal Temporary Waste Shelters Based on Village in Jambi Luar Kota Subdistrict

Source: Researcher, 2022

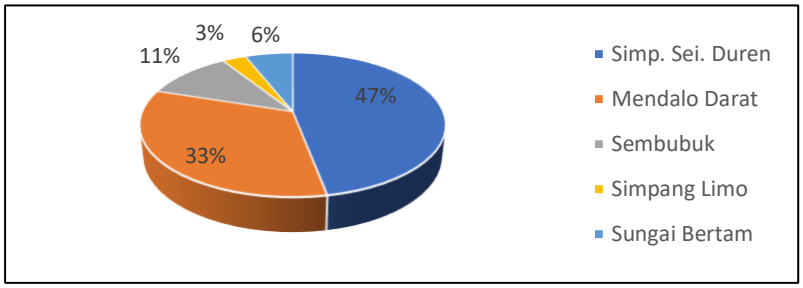

Figure 3. Percentage Distribution of Illegal Temporary Waste Shelter Location Points ,Based on Villages in Jambi Luar Kota Subdistrict

Source: Researcher, 2022

The locations of the temporary waste shelters found were then divided according to the size of the waste volume, namely 1-49 m3 and 50-100 m3. There are 33 locations of illegal temporary waste shelters with a volume of 1-49 m^3 and 3 locations of illegal temporary waste shelters with a volume of 50-100 m^3 in Jambi Outer City Subdistrict. The following are the characteristics of illegal temporary waste shelters points based on area, population, waste volume, and population density and their categories.

Table 1. Characteristics of Illegal Temporary Waste Shelters in Jambi Luar Kota Subdistrict

No	Village Name	Size of Area (km^3)	Number of Population (People)	Density of Population	Category of Population Density	Number of Illegal Temporary Waste Shelter Points by Volume		Total
						1-49 m^3	50-100 m^3	
1	Simpang Sungai Duren	6,56	3.951	601,97	Sedang	16	1	17
2	Mendalo Darat	7,73	13.627	1763,68	Tinggi	10	2	12
3	Sembubuk	25,84	1.758	68,03	Rendah	4	-	4
4	Simpang Limo	7,05	2.496	354,11	Rendah	1	-	1
5	Sungai Bertam	7,75	3.289	424,27	Rendah	2	-	2
	Total					33	3	36

Source: Researcher, 2022

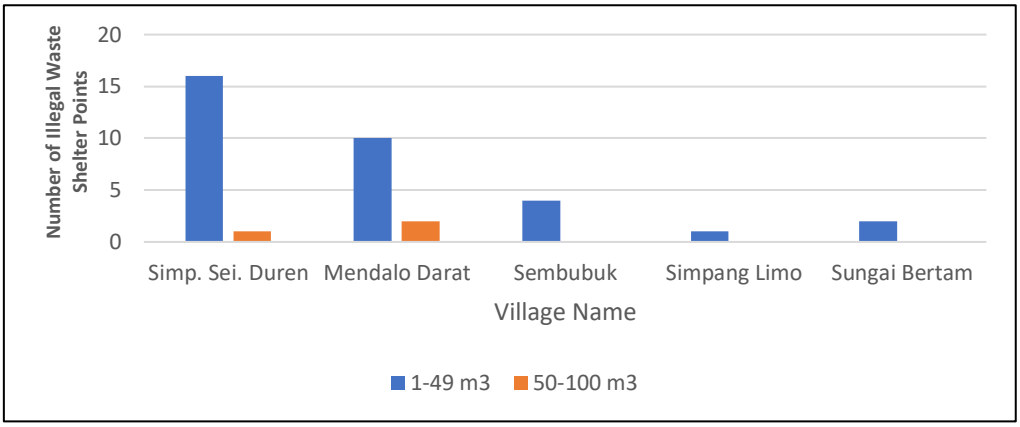

Figure 4. Histogram of the Number of Illegal Temporary Waste Shelter Location Points Based on Waste Volume in Jambi Luar Kota Subdistrict

Source: Researcher, 2022

DISCUSSION

The results of the data analysis of the location points of temporary shelters in all urban villages in the Jambi Outer City Subdistrict, it is known that there are 36 illegal temporary shelters spread across five urban villages, namely 17 points (47%) in Simpang Sungai Duren Village, 12 points (33%) in Mendalo Darat Village, 4 points (11%) in Sembubuk Village, 1 point (3%) in Simpang Limo Village, and 2 points (6%) in Sungai Bertam Village. The distribution of illegal temporary waste shelters locations is uneven, with some close together and some up to 4.34 kilometers away. Factors that are expected to influence the distribution of illegal temporary waste shelters locations in the Jambi Outer City Sub-district are geophysical, anthropogenic, and population factors.

Geophysical factors include the type of land use. The data shows that the type of land that becomes a temporary waste shelter is unoccupied and unused vacant land so it can be concluded that the more and wider the vacant land in a location, the greater the potential for the formation of illegal temporary waste shelters, due to the availability of land for waste disposal and in line with research by Faradilla R et al (2018) and Siswandi E et al (2020).[9,10]

Anthropogenic factors that are in accordance with the distribution of illegal temporary waste shelters locations in the Jambi Luar Kota Subdistrict include the type of road that is close to the temporary waste shelters. The type of road in this study refers to Government Regulation of the Republic of Indonesia Number 34 of 2006 concerning Roads, namely the road function is categorized into arterial, collector, local, and environmental roads. From the results of the research data analysis, it is known that the distribution of illegal temporary waste shelters in Jambi Luar Kota Subdistrict is mostly near neighborhood roads, which is 77.78% while 22.22% are near local roads.

From the survey results to each illegal temporary waste shelters point, it is known that the type of road adjacent to the temporary waste shelters point affects the occurrence of illegal temporary waste shelters location points in Jambi Luar Kota Subdistrict, these results are in line with the research of Siswandi E et al (2020), Faradilla R et al (2018) and Ristianto A et al (2022) which state that the type and access of roads affect the occurrence of illegal temporary waste shelters location points. The number of locations of illegal temporary waste shelters is close to neighborhood roads because the most common type of road is neighborhood roads. With many neighborhood roads, residents who pass through the road can be encouraged to dispose of their waste there or near the road. And the local community is not the only one who disposes of waste in these illegal temporary waste shelters, because anyone can easily dispose of waste there because they are crossing the road.[9,10,11]

Population factors are related to population density, because the volume of waste generated in an area will increase in proportion to the increase in population in the area. Population density is obtained through data on the total population (people) divided by the area (km2), then the population density will be divided into three classes, namely the low class (1000 people/km2). Based on the distribution of population density in Jambi Luar Kota Subdistrict which is related to the number of illegal temporary waste shelters, it is known that urban villages with medium and high population density have more illegal temporary waste shelters in line with the research of Ristianto A et al (2022).[11]

Based on the results of this study, it was found that in the Jambi Luar Kota Subdistrict, there are no legal temporary

waste shelters in accordance with the Regulation of the Minister of Public Works Number 03/PRT/M/2013 concerning the Implementation of Waste Infrastructure in Handling Household Waste and Waste Similar to Household Waste, which are scattered only in the form of waste piles as many as 36 locations, almost all of which are prone to muddy. Based on the calculation of SNI 19-2454-2002, there should be 167 communal legal temporary waste shelters (the number of households is 13,323 households in 2019) scattered at a distance that is not too close and not too far away, so an integrated effort between stakeholders is needed to provide legal temporary waste shelters both in terms of quantity and feasibility.[12]

CONCLUSION

The distribution of temporary waste shelter points in Jambi Luar Kota subdistrict consists entirely of illegal temporary waste shelters in the form of using vacant land, while the minimum standard is 167 legal temporary waste shelters. In addition, medium and high population densities encourage the increasing number of illegal temporary waste shelters. The existence of these illegal temporary waste shelters has the potential to pollute the environment and become a chain of disease transmission because they are located close to neighborhood roads in local residential areas.

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