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Identification of Slum Levels (Case Study of Tegal Besar Sub-District, Kaliwates District, Jember Regency)

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Abstract

Urban population growth in Indonesia is projected to increase by 2.75% annually, with 67% of the population expected to reside in urban areas by 2035. Rapid urban expansion without adequate basic services and infrastructure provision often leads to the formation of slum settlements. Slum settlements, as defined by Law No. 1 of 2011, are areas deemed uninhabitable due to disorganized building layouts, high building density, and substandard infrastructure. Kaliwates District, identified as a regional activity center in Jember Regency's Spatial Plan (2013–2035), has the highest population density and growth rate in the regency, with a density of 5,140 people/km² and an annual growth rate of 106.06% from 2020–2023.One of the identified slum areas in the Kaliwates District is in RT02/RW01, Tegal Besar Sub-district, as designated in Jember Regent Decree No. 188.45/158/1.12/2024. This study uses quantitative and qualitative analysis through a descriptive approach to describe the characteristics of slum areas and analyze the level of slum areas by scoring. This study examines the existing conditions of the slum settlement in RT02/RW01. Evaluate its slum level based on seven variables and 19 criteria outlined in the Regulation of the Minister of Public Works and Housing No. 14/PRT/M/2018. The variables include building conditions, road infrastructure, drainage systems, wastewater management, solid waste management, and fire protection. The research result shows that RT02/RW01, Tegal Besar Sub-district is categorized as medium slum areas.

Keywords: Slum Area, Slum Level, Tegal Besar Sub-istrict

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INTRODUCTION

The urban population growth rate is projected to increase by 2.75% annually, with 67% of Indonesia's population expected to reside in urban areas by 2035 (BPP Nasional, 2019). Uncontrolled urban expansion that is not accompanied by adequate basic services and infrastructure development will lead to the emergence of slum settlements (Prayojana *et al.*, 2020; Atmojo *et al.*, 2021; Muhammad *et al.*, 2023). According to Law No. 1 of 2011, slum settlements are defined as settlements deemed uninhabitable due to disorganized building layouts, high building density, and poor-quality buildings and infrastructure that fail to meet required standards (Oktaviani and Enggarani, 2022).

Jember Regency is one of the regencies located within the Tapal Kuda region, which encompasses seven regencies in the eastern part of East Java Province: Banyuwangi, Bondowoso, Jember, Lumajang, Pasuruan, Situbondo, and Probolinggo (Prasetyo, 2021). Among these, Jember Regency one of the highest population density in the Tapal Kuda region, with a density of 786 people per square kilometer (BPS Jawa Timur, 2024). Kaliwates District, designated as one of the activity centers in Jember Regency according to the 2013–2035 Jember Regency Spatial Plan (RTRW), exhibits the highest population density and growth rate in the regency. According to the Jember Regency in Figures 2024 report (Fitri and Doni Triono, 2020), Kaliwates District has a population density of 5,140

people per square kilometer and a population growth rate of 106.06% per year between 2020 and 2023. Based on Jember Regent Decree No. 188.45/158/1.12/2024 concerning the Locations of Slum Housing and Settlements in Jember Regency in 2024, one of the slum areas in the subdistrict is located in RT02/RW01, Tegal Besar Sub-district (BPS Kabupaten Jember, 2024).

This study aims to analyze the existing conditions of the slum settlement in RT02/RW01, Tegal Besar Sub-district, Kaliwates District, and to assess the level of slum conditions based on seven variables and 19 criteria specified in the Regulation of the Minister of Public Works and Housing No. 14/PRT/M/2018. The seven variables include the condition of buildings, the state of environmental roads, drainage systems, wastewater management, solid waste management, and fire protection measures. The findings of this research are expected to provide alternative solutions to address slum conditions in RT02/RW01, Tegal Besar Sub-district, so that the area can eventually be declared a non-slum settlement.

This research is in line with research conducted by Soetijono et al., (2021) which shows that in urban areas, such as Jember Regency, many settlements develop without clear regulations and spatial planning. The results of this study also indicate the importance of evaluation of urban development policies and regional management to prevent the formation of slums that are increasingly widespread. In addition, according to Faizal, Idayanti and Widyastuti (2024) stated that the rapid expansion of urbanization, especially in uncontrolled areas, has the potential to create slums due to high population density, lack of public facilities, and limited access to basic services such as clean water and sanitation. This study also underlines the importance of government intervention to carry out better spatial planning so that slums can be overcome appropriately

The urgency of this research is highlighted by the rapid urban growth in Jember Regency, particularly Kaliwates District, which has experienced a significant population increase and is characterized by high-density settlements. The high rate of population growth, coupled with inadequate urban infrastructure and services, has contributed to the rise of slum areas. Addressing these issues is critical for ensuring sustainable urban development and improving the quality of life for residents.

This study offers a novel approach by specifically focusing on Kaliwates District in Jember Regency, a region that has not received significant attention in previous research on slum settlements. It also incorporates a detailed analysis of the local policies, including the Jember Regent Decree No. 188.45/158/1.12/2024, and evaluates its effectiveness in addressing slum conditions. Additionally, this research will employ a combination of qualitative and quantitative methods, including spatial analysis and community surveys, to offer a comprehensive understanding of the factors driving slum formation in this specific locality.

The findings of this research are expected to contribute to the formulation of targeted urban planning strategies that prioritize the improvement of slum areas in Kaliwates District and similar urban regions in Indonesia. By understanding the root causes of slum formation, local governments and policymakers can implement more effective interventions. Moreover, the study's recommendations may assist in improving the quality of urban services and infrastructure, leading to more sustainable urban growth and enhanced living conditions for the population.

METHODS

Data collection was conducted using both primary and secondary survey methods. The primary survey involved field observations and interviews (Kendall, 2014), while the secondary survey gathered information and data through literature studies and local

regulatory documents (Peloquin *et al.*, 2020). The analysis methods employed were both quantitative and qualitative, using a descriptive approach. Descriptive research was carried out by illustrating current phenomena related to existing conditions (Loeb *et al.*, 2017). Quantitative analysis was performed using numerical scoring based on indicators relevant to the determining factors of slum settlements.

Research Location

This study was conducted in RT02/RW01, Tegal Besar Sub-district, Kaliwates District, Jember Regency. The survey covered 75 buildings in the area. The research location is depicted in Figure 1.

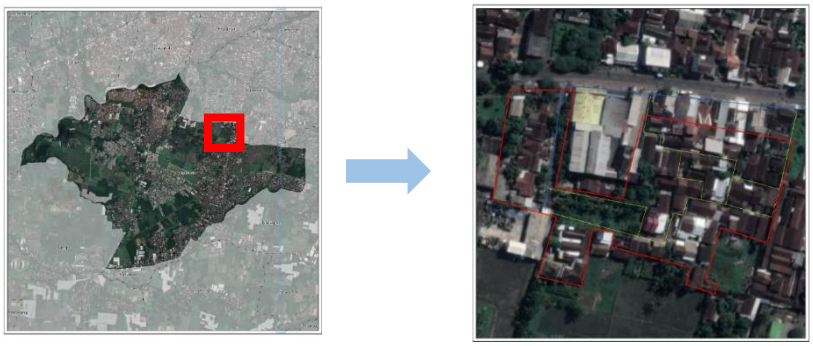

Figure 1. Research Location

Research Variables

The research variables were based on the assessment indicators for slum settlements as stipulated in the Ministry of Public Works and Housing Regulation (Permen PUPR) No. 14 of 2018 concerning the Prevention and Quality Improvement of Slum Housing and Settlements. These indicators consist of seven key aspects of slum settlements (Moh, 2023):

1. Building Structures: Including irregular building layouts, high building density, and non-compliance with technical building requirements.
2. Environmental Roads: Covering the extent of road service coverage and the quality of road surfaces within the settlement.
3. Drinking Water Supply: Encompassing the availability of safe drinking water access and unmet drinking water needs.
4. Drainage Systems: Addressing the inability to manage water runoff, lack of drainage infrastructure, disconnected systems from city drainage, poor maintenance, and inadequate construction quality of drainage systems.
5. Sanitation/Wastewater Management: Highlighting non-compliance of wastewater management systems and facilities with technical standards.
6. Solid Waste Management: Including non-compliance of waste management infrastructure and systems with technical requirements, as well as poorly maintained waste management facilities.
7. Fire Protection: Referring to the unavailability of fire protection infrastructure and facilities.

Following identification based on these seven variables, weighting was applied, and the slum condition scoring was conducted. The weighting and classification of slum levels are detailed in Table 1 and Table 2.

Table 1. Weighting Of Slum Levels

It	Parameters	Score
1	76% - 100% of the area lacks infrastructure for each settlement criterion	5
2	51% - 75% of the area lacks infrastructure for each settlement criterion.	3
3	26% - 50% of the area lacks infrastructure for each settlement criterion.	1
4	0% - 25% of the area lacks infrastructure for each settlement criterion.	0

Table 2. Slum Level Classification

It	Score	Slum Level Classification
1	76 - 100	Severely Slum
2	51 - 75	Moderately Slum
3	26 - 50	Lightly Slum
4	0 - 25	Non-Slum

RESULTS AND DISCUSSION

Existing Condition

The existing conditions of the slum area in RT02/RW01, Tegal Besar Subdistrict, Kaliwates District, are described based on the seven slum indicators as follows:

1. Building Conditions

Out of 75 surveyed residential buildings, 15 units were found to be non-compliant with technical requirements, particularly in aspects such as roofing, flooring, and walls (Table 3).

Table 3. Building Conditions

It	Criteria	Value
1	Total number of buildings (Units)	75
2	Number of irregular buildings (Units)	15
3	Building density (Units/Ha)	51
4	Number of uninhabitable buildings (Units)	15

2. Neighborhood Road Network

The environmental road conditions in RT02/RW01, Tegal Besar Subdistrict, are generally categorized as moderately good. However, 600 meters of the road network are severely damaged, particularly in areas without pavement. These unpaved roads are more prone to damage, especially during the rainy season, which significantly hampers residents' accessibility.

Table 4. Neighborhood Road Network

It	Criteria	Value

1	Total length of the road network (Meters	1.500
2	Road coverage within the area (%)	65%
3	Length of damaged roads (Meters)	600

3. Drinking Water Supply

None of the residents in this area have access to piped drinking water (PDAM). Instead, most households rely on well water for their daily needs.

Table 5. Dringking Water Supply

It	Criteria	Value
1	Number of households with drinking water access (Units)	75
2	Availability of safe drinking water access (Units)	0
3	Percentage of households with access to safe drinking water (%)	100%



Figure 2. Water Conditions

4. Drainage

The availability of drainage systems in RT02/RW01 is uneven. Certain areas lack proper drainage infrastructure, leading to potential waterlogging during heavy rainfall.



Figure 3. Drainage Conditions

5. Wastewater Management

Survey results indicate that 100% of households in RT02/RW01, Tegal Besar Subdistrict, lack a wastewater management system that meets technical standards. Household wastewater is discharged directly into the drainage system.

Table 6. Wastewater Management

It	Criteria	Value
1	Number of Households (Units)	75
2	Non-compliant wastewater management systems (Units)	75
3	Non-compliant wastewater infrastructure and facilities (Units)	75



Figure 4. Wastewater Management Conditions

6. Solid Waste Management

Waste collection services are available in RT02/RW01; however, the frequency of waste collection is not optimal. So there is still often a buildup of waste because the existing waste has not been transported and disposed of at the landfill.



Figure 4. Solid Waste Management

7. Fire Protection

None of the buildings in RT02/RW01 or the entirety of Tegal Besar Subdistrict are equipped with fire protection infrastructure, such as hydrants or fire extinguishers.

Slum Level Calculation

Based on the survey data, weighting was applied according to the parameters outlined in Table 7. The slum level score was calculated as follow:

Table 7. Slum Level Weighting

It	Indicator	Criteria	Score
1	Building COnditions	Irregular building layout	1

It	Indicator	Criteria	Score
		High building density	3
		Substandard building quality	1
2	Neighborhood Roads	Inadequate road network coverage	1
		Poor road surface quality	1
3	Drinking Water Supply	Access to safe drinking water	5
		Unmet drinking water needs	1
4	Drainage Systems	Waterlogging due to inadequate drainage	3
		Lack of drainage infrastructure	3
		Disconnection from urban drainage systems	3
		Poor drainage maintenance	5
		Poor drainage construction quality	5
5	Wastwater Management	Non-compliance with technical standards	5
		Inadequate infrastructure and facilities	5
6	Solid Waste Management	Non-compliant infrastructure and facilities	1
		Inadequate waste management systems	1
		Poor maintenance of facilities	3
7	Fire Protection	Lack of fire protection infrastructure	5
		Lack of fire protection facilities	5
TOTAL SCORE			**59**

Based on Table 7, the total slum level score for RT02/RW01, Tegal Besar Subdistrict, was calculated as 59. This total score was then analyzed using the slum level classification as outlined in Table 8.

Table 8. Slum Level Calculation

Total Score	Range	Slum Level
	76 - 100	Severely Slum
59	51 - 75	Moderately Slum
	26 - 50	Lightly Slum
	0 - 25	Non-Slum

Based on the slum level calculation Table 8, RT02/RW01 in Tegal Besar Subdistrict, Kaliwates District, enter into the "Moderately Slum" category. This indicates that several aspects of the assessment variables still fail to meet the required standards. Therefore, strategic interventions or programs are necessary to address and alleviate the slum conditions in this area.

Slum Area Management Strategy

The strategies to address slum areas are guided by Law No. 01 of 2011 on Housing and Settlements, specifically through activities such as rehabilitation, rejuvenation, or relocation (Article 97, paragraph 1). The approach primarily involves (1) rehabilitation and (2) rejuvenation through on-site upgrading (physical improvement of the area). The proposed actions include:

1. Improving 15 substandard housing units through the "Home Renovation program";
2. Repairing 600 meters of damaged environmental roads using asphalt or paving materials.;

3. Rejuvenating the drainage system by routinely cleaning the drainage channels every month through community service initiatives;
4. Constructing closed drainage systems at points where roads lack adequate drainage.;
5. Replacing the use of groundwater for drinking needs with PDAM water by applying for new PDAM water connections.

CONCLUSION

Based on primary surveys and slum level calculations, it was determined that RT02/RW01, Tegal Besar Sub-district, Kaliwates District, Jember Regency, falls into the moderately slum category with a total score of 59. This classification is due to the mismatch between existing facilities and technical standards, as well as the failure to meet the seven slum assessment indicators. The recommended strategy to reduce the slum level in RT02/RW01 focuses on rehabilitation and rejuvenation, emphasizing the physical improvement of the area.

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