Conference Paper

Physical Environmental Assessment of 'Colorful Village' on the Banks of the Code River, Yogyakarta

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Abstract

In the past, the village on the bank of the Code River looked shabby but was renovated into a colorful village. The problem is whether colorful villages have become ideal settlements or remain slums. The novelty of this study is to find out the level of slums in the colorful village associated with the new policies of improving the quality of slums. The scope of the material is on the assessment of the physical environment in a colorful village. The study aimed to assess the physical environment of the village and to find the cause of slums. The research method for assessment is slum level analysis using weight analysis tools. Data collection methods used are observation, interviews and secondary data processing results. The scope of the area is the Sayidan village area which is on the bank of the Code River, Yogyakarta. As a result, even though the colorful village looks aesthetically beautiful, their physical environment is actually still included in high slums. In conclusion, the level of high slums is due to, the condition of buildings and the condition of infrastructure, that is still not fully following the applicable requirements.

Keywords: assessment, physical environmental, slums, building, infrastructure

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1. Introduction

Embellish the appearance of a shabby village with colorful paint is reported in the news. The village that was painted in full color was then called a colorful village. Aesthetically, this effort seems to succeed in changing the appearance of slums to look beautiful. However, this can't be considered as the right solution to achieve the slum zero percent target, given that there are requirements that must be met. Based on reference studies, it is known that the growth of densely populated areas is influenced by the development of environmental conditions that are not consistent with healthy housing requirements [1, 2]. In line with this statement, problems are often found in urban environments in the emergence of pockets of slums. The tendency of slums is on the banks of the river, under bridges and markets [3–5]. Also, increasing population growth has resulted

in the need for housing. [6] It is known that the quality of the residential environment can be assessed based on basic indicators. To assess the physical environment of the settlement, it can be seen from the condition of the building and the condition of the infrastructure. [7, 8]. Settlement of population and slum settlements that do not meet health requirements in terms of construction and environmental health facilities, can be a source of disease spread [9, 10]. Need to develop residential areas following government policies [11].

The novelty of this study is to find out the level of slums in colorful village associated with new policies to improve the quality of slums. The purpose of this study was to assess the physical environment of colorful villages to determine the severity of slums and to show the causes. This research is useful as input for the development of policies in settlements area.

2. Literature Review

2.1. Understanding settlements and slums

Formally, the definition of settlements in Indonesia is explained in Law Number 01 of 2011 concerning Housing and Settlements, as a housing environment consisting of more than one housing unit that has the infrastructure, facilities, utilities and has activities to support other functions [12]. Furthermore, in the Regulation of Minister of Public Works and Housing Number 02/PRT/M/2016, the definition of slums is narrowed as a settlement which is considered inappropriate due to building irregularities, high density of buildings, low-quality buildings and infrastructure that does not meet the requirements [13].

2.2. New regulations to a slum settlement arrangement

Based on the Regulation of Minister of Public Works and Housing Number 02/PRT/M/2016 concerning Improving the Quality of Slum Housing and Slums, there are criteria stipulated to determine slum conditions for buildings, road environment, the supply of drinking water, environmental drainage, wastewater management, waste management, and fire protection. For infrastructure, the consideration is SNI 03-1733-2004 concerning Procedures for Urban Housing Environmental Planning. [13, 17, 18].

2.3. Yogyakarta city regional regulations

Based on Yogyakarta City Regional Regulation Number 02/2002 concerning Spatial Planning (valid 2010-2029), for housing in general in the cultivation area, it is stipulated that the maximum Basic Building Coefficient is 80 percent. The Yogyakarta City Zoning Regulations for Protected Areas include the setting of a five-meter distance from outside the embankment. There does not appear to be written in the regulation about further arrangements for housing in this protected area. [16]

2.4. Buildings quality and controlling environmental impacts

Housing development should be done by developing environmentally friendly technologies and designs and industry, which are safe for health. In the Attachment of Regulation of Minister of Public Works and Housing Number 02/PRT/M/2015 on Green Buildings, control of the use of materials in buildings is intended to reduce the amount of pollutants, as commonly found in paint, roof coverings, others, causing odor, irritation, and harm to health and the convenience of buildings users [14, 15]

3. Materials and Methods

3.1. Materials and location determination

The object of this research is the physical environment of the colorful village of Sayidan. The physical environment of the settlement to be studied is buildings condition and infrastructures condition. Based on the literature review, the assessment of the physical environment uses criteria such as building regularity, building density, building quality, environmental road infrastructure, water supply infrastructure, drainage infrastructure, wastewater infrastructure, waste management, and fire protection infrastructure [12–20]. The location of the data collection was chosen in the village of Sayidan because there was preliminary information that this village on the edge of the river was known as a location that was not evicted but enhanced with paint, and became an example of its application of colorful village in another area.

3.2. Data collection methods and data analysis methods

Data obtained from observations, short interviews, and secondary data processing. The method for performing slum level analysis is to use a weight analysis tool (Table 1).

The equation used is as follows:

$$\text{Range} = (\sum \text{Maximum Value} - \sum \text{Minimum Value})/\text{class} \quad (1)$$

$$\text{The Severity Level of Slums} = \sum \text{score} \quad (2)$$

Determination of relative weights depending on the preferences of individuals or groups of people. Determined three levels of class, Relatively Not Slum, High Slum, and the worst is, Very High Slum (Table 2).

4. Results

4.1. General description

The location of the Sayidan village is under the Sayidan Bridge, around the Code River area, Yogyakarta City. Sayidan village is the home of migrants from Arab ethnicity, but at present, the village is more inhabited by Javanese. From a short interview, the location of Sayidan village, which is close to the city's economic center, is a reason for residents to stay. Sayidan Village is the oldest riverbank village in the city of Yogyakarta that still survives until now, which is now used as a water tourism village and is a village with colorful paint. However, not in line with this condition, based on the latest regulation of the city of Yogyakarta, the river border area is a protected area. The population density in this village is known to be above the average population density of Yogyakarta city. The ratio of the male and female population is 49.9: 50.1, which means that the female population is more than men. A total of 47.13 percent of household heads are low-income people (Table 3). In the context of building legality, 86 percent of residential buildings do not have building permits, and 89 percent of residential buildings do not have legal documents approved by the government.

Based on the Mayor of Yogyakarta Decree Number 216 of 2016, out of a total of 14 sub-districts in the City of Yogyakarta, 13 of them are slums. Of the total 13 sub-districts, there are 36 urban villages and 229 hamlets which are categorized as slums. Including those categorized as slums, is Prawirodirjan urban village in Gondomanan sub-district, but not for all hamlets inside. Prawirodirjan village consists of three villages, one of which is Sayidan village which has three hamlets, 04, 05 and 06. In general, densely populated slums are on the banks of the Code River.

Table 1: Variabel, criteria, indicators and parameters for assessment of physical environmental.

Variabel	Criteria	Indicator	Parameter	w	mx	mn
Buildings Condition	Building Regularity	Regularity level	>50% unorganized	3	3	1
			25%-50% unorganized	2		
			<25% unorganized	1		
	Building Density	Density level	>75% density	3	3	1
			50-75% density	2		
			<50% density	1		
	Building Quality	Technical requirement	>50% not eligible	3	3	1
			25%-50% not eligible	2		
			<25% not eligible	1		
Maximum: 9; Minimum: 3; Range 2						
Total						
Infrastructures Condition	Accessibility	Quality of infrastructure	>70%% unqualified	3	3	1
			50%-70%% unqualified	2		
			<50% unqualified	1		
	Drainage	Quality of infrastructure	>50% not eligible	3	3	1
			25%-50% not eligible	2		
			<25% not eligible	1		
	Drinking Water	Quality of Infrastructure	>60% not eligible	3	3	1
			30%-50% not eligible	2		
			<30% not eligible	1		
	Wastewater	Quality of Infrastructure	>60% not eligible	3	3	1
			30%-60% not eligible	2		
			<30% not eligible	1		
	Solid Waste	Quality of Management	>70% not eligible	3	3	1
			50%-70% not eligible	2		
			<50% not eligible	1		
	Fire Protection	Quality of Infrastructure	>70%% not eligible	3	3	1
			50%-70%% not eligible	2		
			<50% not eligible	1		
Total						
Maximum: 18; Minimum: 6; Range: 4						
Level of slum						
Maximum: 27; Minimum: 9; Range: 6						
Source: Author's own work as a result of studying literature and secondary data [12–20].						

Table 2: The severity level of slums.

Value Scale	Level
9-14	Relatively Not Slum
15-20	High Slum
>20	Very High Slum
Source: Authors' work as a result of calculation of Table 1 using equation 1.	

Table 3: Profile of sayidan village.

Name of area	Sayidan
Urban village	Prawirodirjan
Sub-district	Gondomanan
City	Yogyakarta
Province	DI Yogyakarta
Coordinate Latitude / Longtitude	-7.8025262 / 110.368563
Number of Hamlets/Neighbourhood	3 Hamlets / 18 Neighbourhoods
Wide area	0,0526 Km2 (5,26 hectare)
Population / Population Density	1158 inhabitants / 220 inhabitants/hectare
Number of Family Head	368 KK
Number of Residential Buildings	244 units
Typology / characteristics	Trade and service
Source: Secondary data collection results.	

4.2. Results of physical environmental assessment at sayidan village

The condition of the building can be seen in Figure 1 and the condition of the infrastructure can be seen in Figure 2.

Furthermore, the results of the assessment of the physical environment for buildings condition and infrastructures condition can be seen in Table 4. The value obtained is 17, thus being at a high slum level.

5. Discussion

5.1. Buildings condition

From results, there are 148 units or 61 percent of residential buildings that do not have regularity building according to requirements. Buildings located on the banks of the river appear to have been reconditioned to have a direction towards the river, while for buildings in the village it still seems irregular. Building density of 23% is deemed acceptable. Approximately 100 units or 41 percent of quality residential buildings are

Figure 1: Picture of buildings condition. (Source: Author's collection.)

Figure 2: Pictures of infrastructures condition. (Source: Author's own collection.)

deemed not to meet technical requirements. Most houses are dark even during the day because the condition of the adjacent buildings prevents sunlight from entering. The majority of house buildings appear to have been painted in bright paint colors, however, the use of decorative paint in buildings that were not well maintained, over time, turned out to produce a lot of peeling paint. The peeling paint is also dangerous to health if swallowed by children. This discussion is supported by the following references [12–16].

Table 4: Results of physical environmental assessment at colorful village of sayidan.

Variabel	Criteria	Indicator	Parameter	Existing	Sc
Buildings Condition	Building Regularity	Regularity level	>50% unorganized	61% of Residential buildings are considered to have no regularity	3
	Building Density	Density level	<50% density	23% density	1
	Building Quality	Technical requirement	25%-50% not eligible	41% of residential buildings do not meet technical requirements	2
					6
Infrastructures Condition	Accessibility	Quality of infrastructure	<50%% unqualified	46% roads are considered need improvement	1
	Drainage	Quality of infrastructure	<25% not eligible	2% with poor drainage conditions	1
	Drinking Water	Quality of Infrastructure	>60% not eligible	64% are not served a properly protected water supply network	3
	Wastewater	Quality of Infrastructure	30%-60% not eligible	49% of the infrastructure does not meet the technical requirements	2
	Solid Waste	Quality of Management	<50% not eligible	0% Domestic waste transported to TPS <2x / week, considered to meet technical requirements	1
	Fire Protection	Quality of Infrastructure	>70%% not eligible	100% or all roads in residential areas do not meet the technical requirement	3
					11
					17
					High Slum
Source: Author's own work in processing data using equation 2					

5.2. Infrastructures condition

In infrastructure for accessibility, some road conditions have poor quality surfaces. There is no separation between residential buildings and roads, such as sidewalks. A small portion of the road has been improved surface quality using paving blocks, but most of the roads on hamlet 05 and hamlet 06 are still not repaired. In infrastructure for drainage, although it is considered zero percent free from puddle, there is still damage

to the physical infrastructure even though it is minimal. Based on brief interviews with residents, sometimes when it rains, floods still occur. This situation requires further investigation. The construction of drainage infrastructure is deemed necessary in hamlet 06. As for infrastructure for drinking water in the form of water pipelines or non-piped water networks, only 36 percent are deemed feasible. In infrastructure for wastewater, it was found that the majority of residential buildings did not meet the complete technical requirements for sewage whereas the infrastructure for solid waste is already good because there is zero percent of domestic waste that is transported to final disposal less than twice per week, which means that it meets technical requirements. In infrastructure for fire protection, most of the road width in residential areas is narrower than the technical requirements for fire protection, which is 3.5 m. The environment with a narrow circulation cannot be traversed by fire trucks, so if a fire occurs it will be difficult to overcome. This discussion is supported by the following references [13–15, 17, 18].

5.3. Slum level

Based on the assessment of the physical environment, the colorful village of Sayidan was at a value of 17 (can be seen from Table 4). Thus the village is at a high slum level (15-20) which can be interpreted as not being in a very slum area, but unfortunately, it has not reached a condition that is considered relatively non-slum (can be seen in Table 2).

6. Conclusion

In conclusion, based on the assessment of the physical environment, the colorful village of Sayidan was at high slum level. Slum level conditions are high because there are requirements in the new regulations that are not fulfilled. It is unfortunate that the conditions of settlement in the village as a whole are not evenly distributed, some areas are good and some areas are still slum. This reinforces the decision of the mayor of Yogyakarta, where only hamlets 05 and hamlet 06 are still categorized as slums, but hamlet 04 are no longer listed. The cause of slum severity in colorful villages is at the level of high slums because the condition of the building does not meet the specified requirements. The regularity of the building is considered not entirely following the provisions, and the quality of the building is considered not to meet the technical requirements fully. The cause of the slum severity in the colorful village is at the level

of the high slum is also due to the condition of infrastructure in terms of quality that has not fully met the specified requirements.

Recommendations, the government needs to plan housing arrangements, improve the quality of roads, and build infiltration wells, as well as improve fire protection infrastructure following the requirements. Regarding the use of paint, it is included as an arrangement for building materials on quality criteria, were based on the requirements it is necessary to pay attention to the impact on the environment and need to pay attention to the health and comfort of the occupants.

References

[1] Surtiani.(2016.) Factors Affecting Creation of Slum Areas in Central City. Master's thesis, University of Diponegoro.

[2] Amri. (2013). Environment Characteristic of Riverside Settlements of Kolaka Sub-district, South East Sulawesi. *Journal of Jupiter*, 13-22.

[3] Soedjajadi, Keman. (2015.) Environmental Health of Housing and Settlements. *Journal of Environmental Health*, 29-42.

[4] Wardani et al. (2017). Effectiveness of Program Performance Provision of Facilities /Infrastructure for settlements. Case Study: Community Based Settlement Environment Setup program, Karangwaru Village, Tegalrejo Sub-district, Yogyakarta City. *Proceedings of the National Seminar on Economics and Business.* Jember:UJ

[5] Hariyanto. (2016). Strategy for handling Slum Areas as an Effort to Create a Healthy Housing and Settlement Environment. *Journal of PWK*, 11-37.

[6] Setiawan et al. (2016). Priority Factor Cause of Slum Area of Slums in Belitung Selatan Urban Village Banjarmasin. *Journal of Engineering*, 2337-2539.

[7] Aslim. (2014). Public Perception on The Quality of Neighborhood Environment. *Proceedings of IPLBI Scientific Meeting*. Bandung: SAPPK ITB.

[8] Ridwan. (2012) Quality of Bajo Tribal Community neighborhoods in Sub-district and Sub-district Character Areas in Muna District. *Journal of Regional and City development*, 118-125.

[9] Kurniadi. (2014). Analysis of Environmental Quality of Settlement in Kotagede District Yogyakarta Ciity using Quickbird Image. Master's thesis, Yogyakarta State University.

[10] Sumunar. (2002) Research Report on The Environmental Quality of The Urban City of Yogyakarta City with The Black Panchromatic Air Photos and Geographic Information System. *Research Report*, Yogyakarta State University.

[11] Prasti. (2015) Physical Condition and Quality of Settlement Coastal Area of Baolan Sub-district of Tolitoli District. *Journal of Geo Tandulako*, 71-83.

[12] Law Number 01 of 2011 on Housing and Settlement Areas

[13] Regulation of Minister of Public Works and Housing Number 02/PRT/M/2016 on Improving the quality of slum housing and slums.

[14] Regulation of Minister of Public Works and Housing Number 02/PRT /M/ 2015 on Green Building Buildings and Attachments.

[15] Decree of Minister of Health of the Republic of Indonesia Number 829 / Menkes / SK / VII / 1999 on the requirements of home health.

[16] Yogyakarta City Regulation No.02/2010 concerning Spatial plans.

[17] SNI 03-1733-2004 on the procedures for planning the urban housing environment.

[18] SNI 03-1745-1989 on Procedure Installation of Hydrant System for Fire Prevention at House and Building.

[19] Directorate General of Human Settlements. (2014) Quick Count Activity Guide for Identifying Slum Areas.

[20] Directorate General of Human Settlements. (2006) Guidelines for Identifying Slum Settlement Areas of the Metropolitan City Buffer Area. 2006.