Infrastructure Improvement Program to Create A Healthy Environment Based on The Sustainable Development Goals in Badran Yogyakarta

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ABSTRACT
The 2030 Sustainable Development Goals (SDGs) targets include sustainable settlements that are inclusive, safe, and resilient. The rapid population growth rate of the city of Yogyakarta (0.58% per year) will gradually raise problems in the settlement sector. This research focuses on the physical problems of settlements related to infrastructure improvements in Kampong Badran Yogyakarta. This research aims to create an infrastructure improvement program, namely roads, drainage, and sanitation, to create a healthy and sustainable settlement environment. The research method used is qualitative with a descriptive approach, namely literature data collection, resident interviews, and direct observation. The result is that on a 3 meters wide road, it is necessary to improve access by building drainage and sidewalks. On footpaths with a width of 0.5-2.0 meters, it is necessary to increase it by making drainage in the form of an inlet on the shoulder of the footpaths or building box culverts under the footpaths. Construction of drainage for the disposal of wastewater and rainwater runoff. A sanitation improvement program should be carried out on a 40% completed sewerage. In conclusion, infrastructure improvement programs will create better living conditions for families. The program also involves local communities in the process, ensuring long-term sustainability.

Keywords—*infrastructure, improvement, kampong, settlement, sustainable*

1. INTRODUCTION

Kampong is residential units in urban areas that were considered traditional settlement arrangements prior to the arrival of modern settlement planning. *Kampong* is a growing embryo, therefore the arrangement of an urban area needs to pay attention to the existence of the *kampong* as a starting point for planning [2]

According to [7], the face of a city is of course largely determined by the character of the *kampong* that surrounds it. *Kampong* dynamics in urban areas are also inseparable from the activities and character of its residents; so it will give birth to the characteristics and character of what the *kampung* is like. *Kampong* Badran in Yogyakarta City is one of the *kampongs* that shows this dynamic. The development of *Kampong* Badran can be traced based on the stages of its development, based on the history of the *kampong,* and the activities of its residents.

Kampong Badran is currently one of the densest settlements in the city of Yogyakarta (Source: Department of Population and Civil Registration in 2022). Administratively it is located in the Bumijo Village area, Jetis District, Yogyakarta City. *Kampong* Badran is directly adjacent to one of the major rivers that cross Yogyakarta, namely the Winongo River. The condition of the settlements in Kampong Badran RT.42/09 is shown by the number of residents of 300 people with 51 families with an average of 1 household consisting of 5 to 6 people. Efforts to overcome settlement problems in Kampong Badran need to pay attention to housing objectives in Government Regulation no. 14/2016, namely housing as an effort to meet basic needs aims so that residents have a decent and healthy life, according to the development and condition of the population. Efforts to improve roads, drainage, and sanitation in Kampong Badran are at the same time realizing the Sustainable Development Goals (SDGs) targets in 2030. The SDGs up to 2030 are (1) sustainable sanitation and (2) settlements that are inclusive, safe, resilient, and sustainable (Renstra 2020-2024 Ministry of PUPR).

A. Formulation of The Problem

Problems in Kampong Badran are common problems of dense settlements in urban areas, namely the condition of housing that is damaged and uninhabitable, very high building density, narrow road widths, poor circulation, irregular arrangement patterns, drainage, and sanitation with inadequate bathing-washing-latrines. insufficient.

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Of the many physical problems above, there are still non-physical problems such as social and economic problems.

B. Research Purpose

The aim of this research is to create an infrastructure improvement program, namely roads, drainage, and sanitation in an effort to create a healthy and sustainable settlement environment. Road, drainage, and sanitation improvements in Kampong Badran are key elements of this program and are expected to be the first step to encourage local businesses to renovate their homes.

2. THEORENTICAL REVIEW

- Learning from the "world habitat awards" regarding the Kampong Improvement Program in Surabaya, it was stated that the infrastructure improvement program provided an increase in a clean kampong, with lots of plants visible everywhere. The kampong provides favorable conditions for starting any kind of informal business or home industry.
- Iska Aprilya Wulandari, dkk (2019). The City Without Slums Program launched by the government is to increase access to basic infrastructure and services in urban slum areas to support the realization of livable, productive, and sustainable urban settlements. The results of the study concluded that the implementation of the KOTAKU program had not gone well in realizing a slum-free environmental area and when it was related to the achievement of objectives it had not been optimal due to the presence of inhibiting factors in the implementation of the KOTAKU program such as the program's objectives had not been achieved. Substandard coordination between implementing agencies at the district/city and sub-district levels, no monitoring to ensure the accuracy of the quality of assistance, and a lack of community participation.
- In accordance with Government Regulation No. 26 of 1985, the classification of roads in the Kampong Badran area includes class III C roads, namely local roads that can be passed by motorized vehicles including loads with a width not exceeding 2,100 mm, a length not exceeding 9,000 mm and a maximum permitted axle load of 8 tons.
- SANITATION; According to WHO limits, what is meant by environmental sanitation is an effort to control the human physical environment which can or may have an adverse effect on physical health and survival. A healthy home must have facilities related to sanitation, namely: Adequate supply of clean water, fecal sewer, and wastewater disposal channels, which include: water used for bathing, water used for washing clothes, and kitchen wastewater.

3. RESEARCH METHODS

The research method used is a qualitative method and a descriptive approach, namely exploring literature or secondary data obtained from the Central Bureau of Statistics (*Badan Pusat Statistik*). Interviews with residents and direct observation of road, drainage, and sanitation conditions in Kampong Badran Yogyakarta. Direct observation of conditions in the field in order to obtain primary data, namely the number of houses and their occupants, the adequacy of the dimensions of the house according to housing planning standards in the city, the layout of the house, and the availability of settlement infrastructure. Analysis of existing data on roads and footpaths based on the Indonesian National Standard, namely the condition of roadsides and sidewalks for pedestrians, settlement infrastructure according to their carrying capacity, and optimal needs that can be served. The results of this analysis are used as the basis for creating an infrastructure improvement program in Kampung Badran Yogyakarta.

4. RESULTS AND DISCUSSIONS

Residential renovations are carried out by the residents themselves and are not part of the program. So this program has multiple results for overall environmental improvement. The existing road is being repaired, with a side channel on the shoulder of the road, namely (1) on a 3-meter wide road, it is necessary to increase access by building drainage and sidewalks, (2) on footpaths with a width of 0.5-2.0 meters it is necessary to increase by building drainage in the form of inlets (50x50 cm) on the shoulders of the footpath or box culverts under the body of the footpath. Side drainage is provided along roads and footpaths for wastewater discharge and for rapid rainwater runoff. The community was involved in the Kampong Badran improvement program from the very beginning. An initial survey of physical conditions in the kampung was carried out in collaboration with residents and community needs and problems were discussed with them, providing a basis for future improvement plans.

This infrastructure improvement program not only creates better living conditions for residents but also, by involving the local community in the process, ensures long-term sustainability and continuous improvement. The Infrastructure improvement program provides an innovative method of mobilizing the community's own resources to transform high-density urban informal settlements into healthy and sustainable environments.

The results of infrastructure observations in Kampong Badran are as follows:

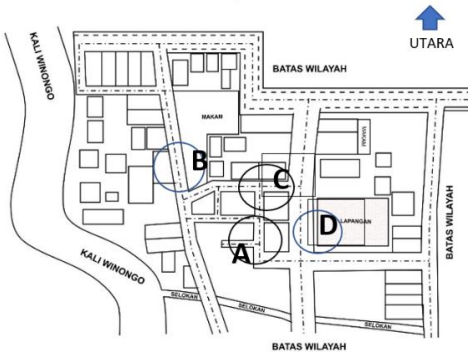


Figure 1: Map of Kampong Badran RT.42 Yogyakarta.

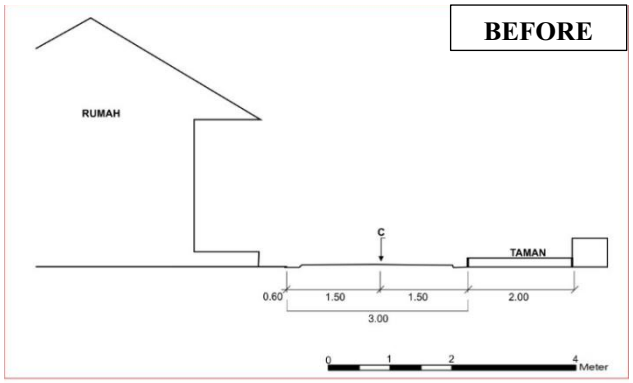
Figure 2:
Detail A, footpath with a width of 1.00 meters

Figure 3:
Detail B, Footpath with a width of 1.50 meters

Figure 4:
Detail C, Road with a width of 2.00 meters

Gambar 5:
Detail D, Road with a width of 2.00 meters

The design of the road and drainage improvement program is as shown below:



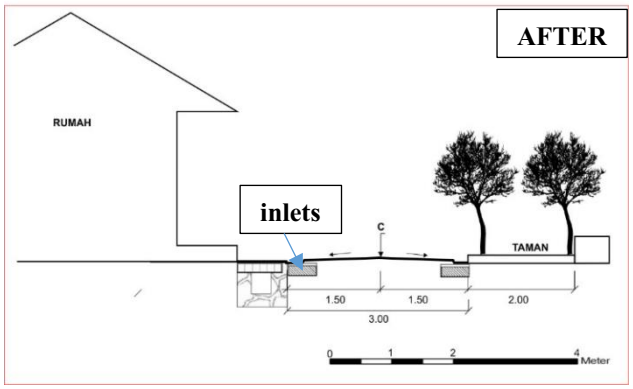


Figure 6: Construction of inlets and sidewalks on a 3.00-meter-wide road

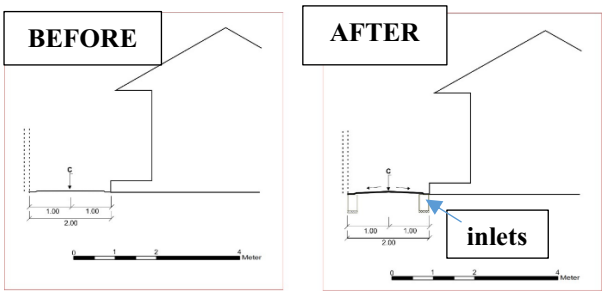


Figure 7: Construction of inlets on the side of a 2.00-meter-wide road

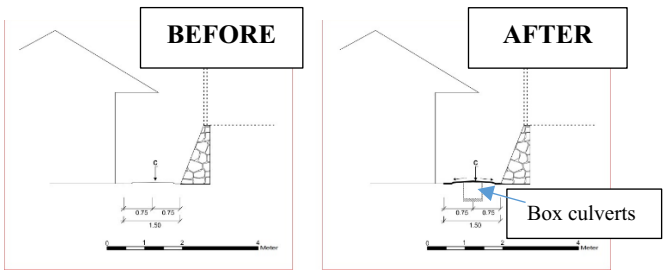


Figure 8: Construction of a Box Culvert on a 1.50-meter-wide road

Table 1: Sanitation Observations in Kampong Badran RT.42 Yogyakarta

Source: Author analysis

No	Object Of Observation	Clean Water			Fecal Tract	Water Used Bath / Wash	Kitchen Waste Water
		Quantity	Quality	Source			
1.	A House	Enough	Good	PDAM	Available	Available	Nothing
2.	B House	Enough	Not Enough	Well	Available	Available	Nothing
3.	C House	Enough	Good	PDAM	Available	Available	Nothing
4.	D House	Enough	Good	PDAM	Available	Available	Nothing
5.	E House	Enough	Not Enough	Well	Available	Available	Nothing

From observations at the location, it can be concluded that the average quantity of clean water for household use is sufficient. In terms of the quality of clean water in Kampong Badran, it needs to be improved again, because some households are still not clean enough and smell bad during the rainy season, especially with clean water sources in the form of wells. Regarding fecal ducts, all households have used waste channels for bathing and washing, but their maintenance needs to be improved. The conditions at the survey site, even though the sewage system is in place, the household environment still smells bad. Kampong Badran has no kitchen wastewater at all. The kitchen waste water channel is combined with the wastewater channel used for bathing and washing which will result in frequent blockages when the volume of wastewater is too much.

CONCLUSIONS AND RECOMMENDATIONS

This program has a dual outcome toward overall environmental improvement. This infrastructure improvement program creates better living conditions for low-income families, by involving local communities in the process, ensuring long-term sustainability and continuous improvement.

Recommendation: It is necessary to carry out further studies regarding the problems in Kampong Badran, especially the infrastructure problems. It is necessary to construct a wastewater disposal installation for the joint disposal of feces which is used by several houses located close together. Existing sewerage channels need to be repaired again. The sewerage channel for waste from bathrooms is used for washing clothes; and kitchen waste.

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