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# Spatial Analysis of Slum Level in the Coastal Area of Anaiwoi Village, Kolaka Regency

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***Abstract***;- This research was conducted to identify needs for facilities and infrastructure based on spatial analysis in the slum area of Anaiwoi Village. The research was conducted in Anaiwoi Village, Kolaka Regency. Data was collected by observation at the research location (documentation, aerial photography, and existing conditions of slum areas) as well as secondary data obtained from several agencies such as Bappeda, BPS, Kolaka Regency Housing and Settlement Service. The results of the research concluded that a) the level of slums in Anaiwoi Village is moderate slum and b) the need for facilities and infrastructure in the Anaiwoi Village slum area is: (1) Construction of Uninhabitable Houses, (2) Paving of neighborhood roads, (3) Construction of footbridges, (4) Construction of street lights, (5) Construction of Duiker, (6) Procurement of individual and communal toilets, (7) Procurement of clean water pipes, (8) Procurement of trash cans, (9) Construction of fire extinguishers.

***Keyword****: Slum Housing, Spatial Analysis, Kolaka*

## 1. Introduction

The numbers of people living in cities in the 21st century will progressively increase [1] Urban development will always in same line with the residential dynamics [2]. The studies about urban development especially for the big cities in Indonesia, are inseparable matters of globalization and modernization impact. Data from WUP [3] said that in 2050, nearly 66 % of the world population to be urban with nearly of 90 % of the increase concentrated in Asia and Africa.

The impact of these conditions can cause various problems that can change the face of urban settlements, one of which is turning urban settlements into slums. Due to the influx of rural populations into urban areas in search of subsistence, the slums settlments are continuing to increase and the quality of housing to decline [4]. Some people settled and struggled in slums, sometimes those were only a few meters away from the upper community and commercial areas [5]. Furthermore, the number of dwellings present, characterized by the lack of sanitation and public services, inadequate construction conditions and irregular land tenure [6]

Slum settlements are settlements that are unfit for habitation because of the irregularity of the buildings, high levels of building density, and the quality of the buildings and facilities and infrastructure that do not meet the requirements. [7]

There are several methods or ways could be utilized to identify slums in a city or region and to determine whether the certain area could affect slums escalation. Each slum performs different conditions, slums may

develop or new slums may emerge, both could be enhanced through high rural-urban migration rates or location circum stance that usually being indicated as inappropriate for housing (river banks, steep slopes, landfills, uninhabitated land, railroad lines, adjacency towards industrial areas or markets and all over river banks) [8]

According to Rachmawati, R., Rijanta, R., & Subanu, L. [9] believes that the development of the city center which is the center of economic activity becomes the attraction for the community that can bring influence to the high flow of labour both from within the city itself and from outside the city area, thus causing the high flow of urbanization.

The problem of slum settlements and the impacts they cause have become a serious concern for the world, at the 2015 UN general assembly it was agreed to adopt the Sustainable Development Goals (SDG) for the 2015-2030 period. The results of the meeting produced 17 goals and 169 targets for the 2015-2030 implementation period. The problem of handling slum settlements is contained in the 11th goal, namely Sustainable Cities and Communities with the target "by 2030, guarantee access for all to adequate, safe and affordable housing, including the arrangement of slum areas, as well as access to basic urban services [10]. The Indonesian state has been actively involved in various international forums in formulating the SDGs. In line with the formulation of SDGs at the global level. Based on data from Bappenas in 2014, the number of slum areas in Indonesia was 38,431 Ha, with a target of reducing slums by 7,686 Ha every year within 5 years. As a result, until the end of 2019, residential area development activities had been able to reduce the area of urban slum settlements by 32,222 ha, namely from 38,431 ha of slum settlements in 2014 to 6,209 ha at the end of 2019 [11].

Kolaka is one of the regency in South East Sulawesi. As one of the biggest city in the province, Kolaka regency has same problem with another growing city are population growth and urbanization and cause several problems, one of them is the emergence of slums. One of the slum areas in Kolaka Regency is located in Anaiwoi Village, Tanggetada Sub District, which has not been handled.

The slum area of Anaiwoi Village is included in the heavy slum category with a total area of 18.8 Ha [12].. The typology of the Anaiwoi slum area is coastal or waterside and is part of the capital area of Tanggetada Sub District, Kolaka Regency. The characteristic of the people in the Anaiwoi slum area is that they generally make their living as fishermen, which means that the source of income for the Anaiwoi fishing community is marine products, both fish and taripang, apart from that there are also traders who work as traders. [13].

According to Sadyohutomo [14], the causes of the emergence of slums in many plances are as follows:the higher city growth which is not balanced by sufficient income levels and the delays of government in planning and building in new infrastructure (especially roads) in new residential development areas. There are several factors that cause the growth of slum settlements in urban areas, namely: urbanization factor, urban land factor, infrastructure and facilities factor, social and economic factor and spatial factor. [15]

The usage of spatial analysis for the urban planning and development is important for identifying more clearly about the problems [16]. Several studies about slum have been carried out and have become a reference source for this research. Wijaya et al [17] conducted a field study of a slum located in Manggarai Village, South Jakarta conclude that the communal space usage not only in public locations that already remained in a spatial planning, but also communal space utilization also occupied a huge of space for road. Anurogo et al [18] conclude that the usage of spatial approach is one of the main approach of the geography and helps to identify slum areas partially extracted using remote sensing data and for parameters that cannot be extracted using remote sensing data, information obtained from field surveys with information retrieval based on reference data especially in East Wara Sub-District.

## 2. Material and Methods

### Study Area

The Study area employed in this study was in Kolaka regency especially Anaiwoi Village, Tanggetada District, Kolaka Regency. The research location was described in image below.

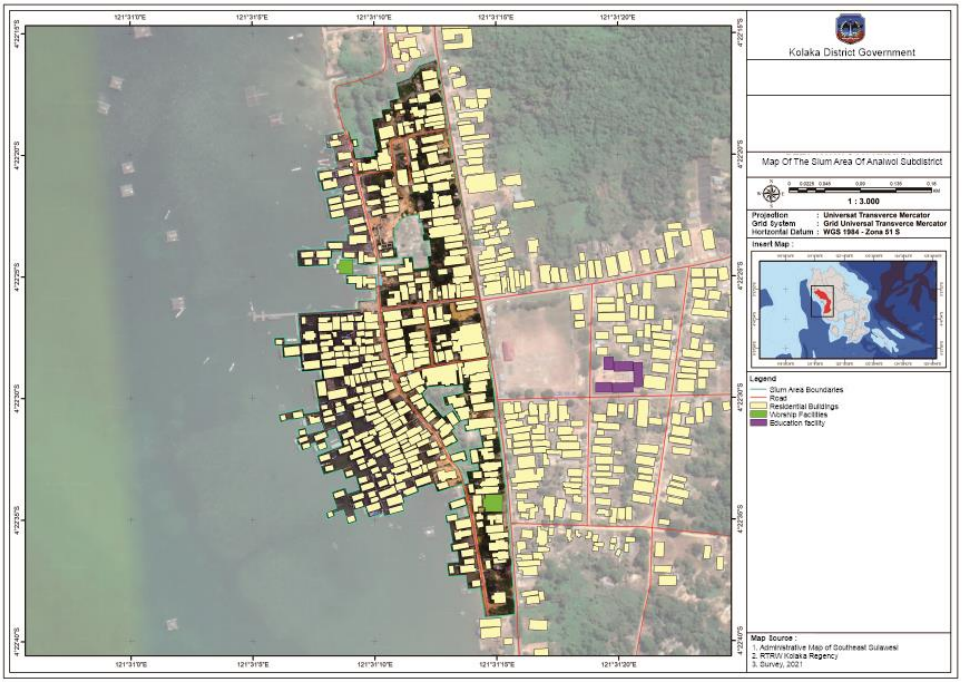


**Figure 1. Map of research location**

**Data resources**

The data was collected by observation result in research location (documentation, aerial photo and existing conditions of slum areas). Another data are secondary data was obtained from agencies such as the Department of Public Works, Housing and Settlements, Bapedda, BPS Kolaka Regency and several related and reference agencies. The parameters affecting the slums referring to PUPR Ministerial Regulation no. 14 of 2018 [17]. The parameter are shown in table 1

**Table 1. Parameter affecting slums area**

| No | Variables | Information |
|---|---|---|
| 1 | Physical Aspect | Building |
| | | Environmental roads |
| | | Drainage |
| | | Dringking Water |
| | | Waste Water |
| | | Waste |
| | | Fire Protection |
| 2 | Non-physical aspects | Land Legality |
| | | Population |
| | | Livelihood |
| | | Electrical Power |
| | | Health Services |

*Source: The PUPR Ministerial Regulation no. 14 of 2018*

## 3. Result and Discussion

### Profile of the Kolaka Slum Area

The Kolaka Regency Government has issued Decree of Slum Areas in 2014 and 2018 and shows an increase in the number of slum areas in 2018 which will be described in Table 2 below.

**Table 2. Number of Locations and Size of Slum Areas in Kolaka Regency**

| No | Variables | Decree of Slum Areas in 2014 | Decree of Slum Areas in 2018 |
|---|---|---|---|
| 1 | Number of Locations | 14 | 38 |
| 2 | Size of Slum Areas | 105,23 | 400,76 |

*Source: The Government of Kolaka Regency (2023)*

Based on table 2 above, it shows a good increase in the number of slum areas from 14 locations in the 2014 Decree to 38 locations in the 2018 Decree as well as an increase in area from only 105.23 to 400.76 Ha based on the 2018 Decree. The Slums in Anaiwoi Village is described in Table 3 below.

**Table 3. Percentage Anaiwoi Village Slum Areas to Kolaka Regency**

| Slum Area in Decree | The Result verification of Slum Area | Percentage of Slum area to total area |
|---|---|---|
| 18.80 | 6.43 | 0.41 |

*Source: The Government of Kolaka Regency (2023)*

The infrastructure problems and slum conditions in the Anaiwoi slum area in terms of indicators are described as follows:

**Table 4. Percentage of Physical Conditions of Slums in the Anaiwoi Village**

| Aspect | Indicator | Percentage (%) |
|---|---|---|
| Building | Building Irregularities | 56.14 |
| | The level of Building Density | 0 |
| | Non Conformity with the requirement of Building Technical | 37.34 |
| The Neighboorhood Road | The Environmental Road Network Does Not Serve All Housing and Settlment Environments | 32.92 |
| | Poor Environmental Road Surface Quality | 63.21 |
| Dringking Water | The Availability of Safe Access to Dringking Water | 52.87 |
| | The Needs of Drinking Water is not Fulfilled | 53.07 |
| Environmental Drainage | Environmental Drainage Not Available | 15.14 |
| | Environmental drainage is unable to drain rainwater runoff, causing puddles | 26.72 |
| | The poor quality of construction quality Drainage Environment | 30.04 |
| Waste water | Waste Water Management System Does Not Comply with Technical Standards | 49.7 |

| | | |
|---|---|---|
| | Waste Water Facilities and Infrastructure Do Not Comply with Technical Standards | 47.72 |
| Waste | Waste Facilities and Infrastructure Do Not Meet Technical Requirements | 100 |
| | Waste Management System Does Not Meet Technical Requirements | 100 |
| Fire Protection | Unavailability of Fire Protection Infrastructure | 84.96 |
| | Unavailability of Fire Protection Means | 84.96 |

*Source: Primary Data (2023)*

**Figure 2. Condition of Uninhabitable Residential Buildings**

The picture above shows an uninhabitable house in Anaiwoi Village and it become one of indicator of slum housing.

**Figure 3. Condition of Environmental Road Condition**

The picture above shows an condition of environmental road conditions in Anaiwoi Village and it become one of indicator of slum housing.

1. Needs for Facilities and Infrastructure in Anaiwori Slum Area

The need for facilities and infrastructure in the Anaiwoi Village slum area is intended to improve the quality and prevention of slum housing and slum settlements in the Anaiwoi Village slum area.

The objectives of this Settlement Environmental Management Action Plan are:

a. Consolidating development regulations within the coverage area;
b. Creating frame of reference for land use in the area Bajo Anaiwoi Tribe Slum Settlement;
c. Promoting the quality of life and welfare for residents of the Bajo Anaiwoi Tribe Slum Settlement area;
d. Supporting environmentally sound and sustainable development;
e. Identifying and protect things that contribute to the locality, appearance, environmental and cultural heritage of the Bajo Anaiwoi Tribe Slum Settlement area;

f. Stimulating the availability of affordable and diverse housing as well as tourist spots that can develop to support the community's economy

g. Maximizing opportunities for the growth of the business environment and employment, especially in commercial areas within the Bajo Anaiwoi Tribe Slum Settlement area

h. Encouraging the creation of a safe and accessible residential environment.

Some planning targets for the aspects in question include:

a. Building aspect

The environmental planning target is to have order and each building meets technical standards. The handling program include:

1) In existing residential zones, slum management is carried out by repairing uninhabitable houses.

2) New settlement (multiunit housing) with a waterfront concept. This settlement is prioritized as a new fishing settlement.

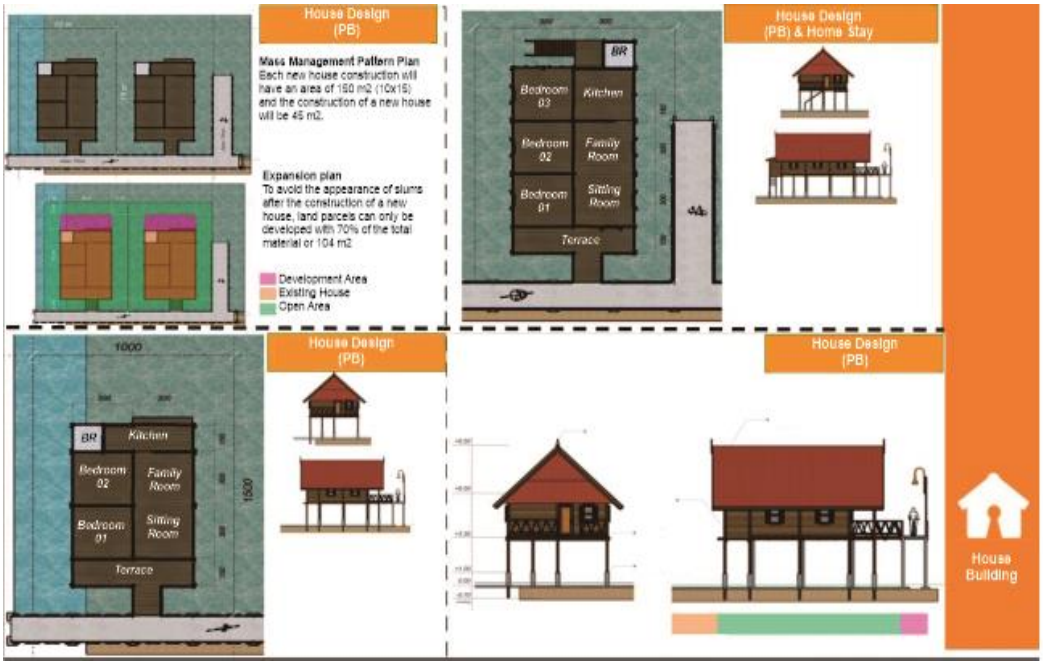


**Figure 4. New Construction House Design Plan and Home Stay**

b. Accesibility Aspect

The planning target is to provide easy accessibility between environments and within environments.

1) Interregional roads

The construction of roads between areas in the form of footbridges in sea areas and concrete slabs in land areas is intended to connect areas. This new road is also intended as a new orientation for residential areas with a waterfront concept, as well as stimulating the development of residential areas in the tourism sector by forming tourist corridors.

2) Neighborhood roads

The environmental roads aspect is carried out by improving the quality of service and repairing or rejuvenating environmental roads. Addition of road supporting facilities with the aim of increasings safety and comfort for user.


**Figure 5. Action Plan for Handling Accessibility Aspects**

c. Aspect of clean water

The clean water supply system in the Bajo Anaiwoi Tribe Slum Settlement can be done by:

1) Piping system with KSM operator) with providing clean water by relying on spring sources

2) Provision of clean water through deep dug wells (drilled wells) with an upper reservoir system and public taps in certain areas that cannot be served by simple Dringking Water Supply (SPAM).

d. Drainage Aspect

Drainage channels act as flood and inundation controls by paying attention to the integration of their implementation with other city infrastructure and facilities with the aim of:

1) Improving environmental quality by eliminating puddles

2) Prevent flooding and inundation in residential areas.

3) Drainage development is carried out through network repair, network expansion and network maintenance.

4) Improving the quality of the drainage network leads to a healthier drainage system and can add to the beauty of the environment.

e. Wastewater Aspects

This residential wastewater needs to be managed so that it does not cause impacts such as polluting surface water and ground water, as well as being very risky for causing diseases, such as: diarrhea, typhus, cholera and others. So the planning targets for improving the quality of family and communal latrines and managing waste water before it is discharged into the environment are:

1) Empowerment through socialization about the importance of waste management

2) Improving the Quality of infrastructure of bath, wash and toilet for people.

3) Waste water management is intended to prevent environmental pollution, through on-site processing systems.

f. Aspect of Waste

The waste planning targets are (1) a waste-free environment, (2) there is an independent handling system that is integrated with the Kolaka Regency waste handling system.

g. Aspect of Fire

The planning objective of the entire environment is free and responsive to fire hazards. Handling fire aspects starts with fire prevention efforts themselves. Furthermore, increasing the community's ability to handle fires with the by ourselves program, Providing Fire Protection Facilities and Infrastructure.

h. Aspect of Public Open Space

The slum settlements of the Bajo tribe in village of Anaiwoi which are located in the coastal area provide added value to this area. So the development of Public Open Space (RTP) is directed at coastal areas outside settlements and area gates. The RTP is designed according to comfort standards and its development will become an activity node which can later be developed into a tourism area so that it can support the community's economy. RTP is also intended as disaster evacuation points.

The explanation regarding the need to encourage the improvement of Bajo village is in line with the concept put forward by Wesnawa [18] that there is a need for space utilization based on local wisdom in Buleleng Regency, Bali Province.

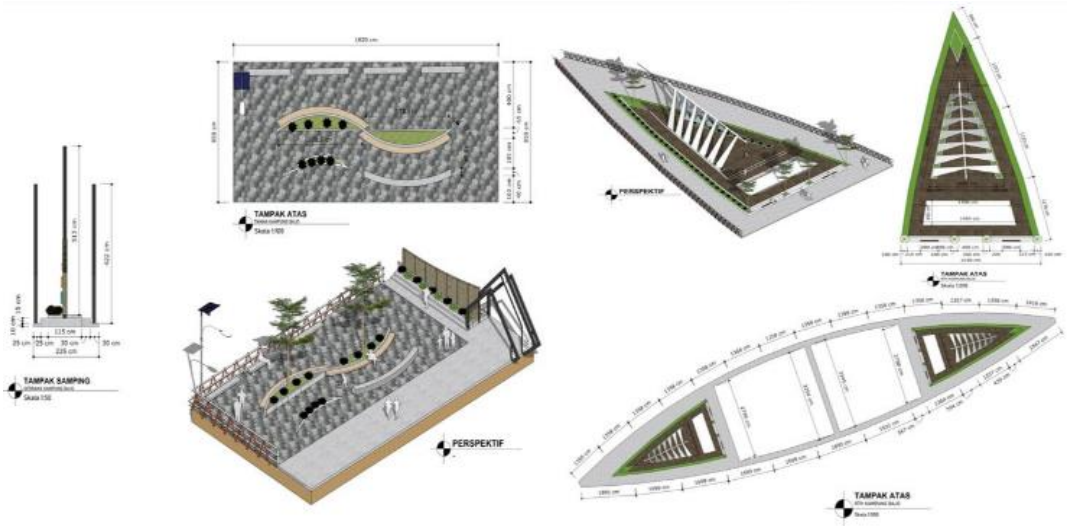


**Figure 6. Design Plan of Public Open Space**

The recommendation of this research is to encourage the improvement of the slum area in Anaiwoi Village from various aspects and is also reinforced with before and after planning photos.


**Figure 7. Before and After Building Management**

**Figure 8. Before and After Handling Accessibility**

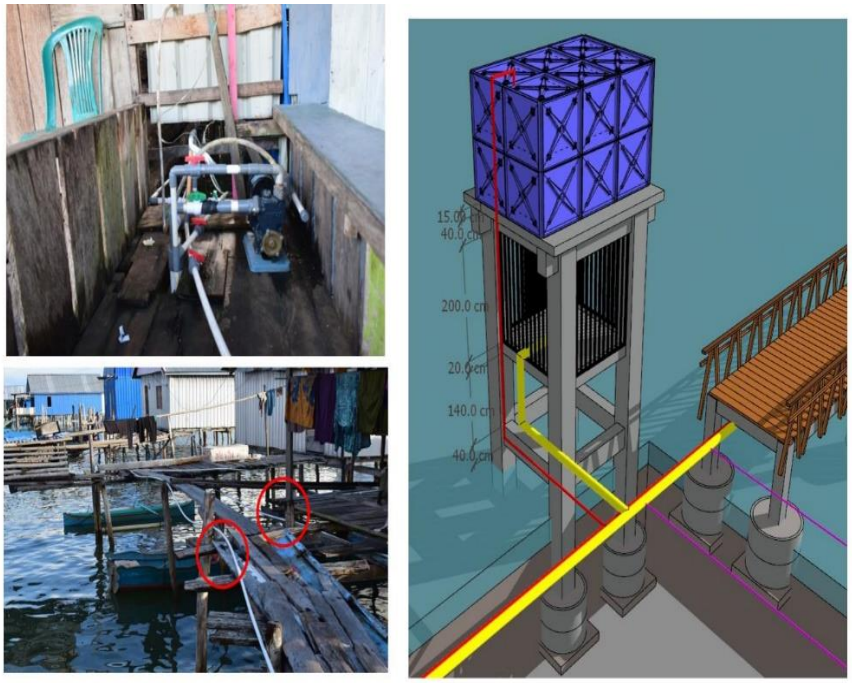


**Figure 9. Before and After Handling Drinking Water**

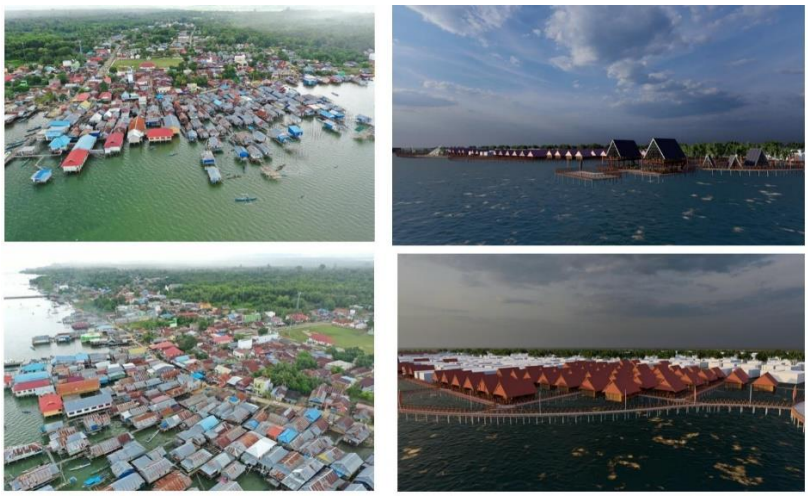

**Figure 10. Before and After Handling of Residential Areas**

## 4. Conclusion

Based on the observation and identifying the indicator, it can be concluded that the level of slum area in Anaiwoi Village is medium Slum. The need for facilities and infrastructure in the slum area of Anaiwoi Village, namely: (1) Construction of Uninhabitable Houses, (2) Paving of environmental roads, (3) Construction of footbridges, (4) Construction of street lights, (5) Duiker construction, (6) Procurement of individual and communal toilets, (7) Procurement of clean water pipes, (8) Procurement of trash cans, (9) Construction of fire extinguishers.

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