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The Planning and Design of Residential Facilities in Poor Areas with Limited Land

A Case Study of Muharto Residential area along the Brantas River, Malang, Indonesia

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Keywords: Limited land; Residential Facilities; Riverside; Planning and Design; Poor Areas

Abstract: This paper summarises the proposed physical planning and design in the poor area of Kampong Muharto, Malang City. As a community, the residents want to adjust their spatial setting to accommodate for social activities. This research lays out several options for their neighbourhood with consideration for the available space. The study area was analysed using the Strength-Weakness-Opportunity-Threat (SWOT) method and it was found that there were two sections of the area in need of planning and design. The primary objective of this work is to figure out the spatial arrangement for the project with a direct understanding of the various needs of the housing facilities within the limitations of the land boundaries.

1. INTRODUCTION

Urban settlement in developing countries, such as Indonesia, often leads to substandard living conditions as one of the negative impacts of urbanisation. The development of cities often triggers development on land that should not be used for residential purposes (El Menshawy, Aly, & Salman, 2011; Orenstein & Hamburg, 2009; Tutuko & Shen, 2016). This leads to increasing environmental degradation, both in urban and rural areas, as well as problems for economic sustainability (Wikantiyoso & Tutuko, 2013). It is therefore necessary to focus on economic orientation (development orientation), environmental sustainability (environmental orientation) and community interests (community orientation). The central issue for the transformation of dwellings from a cultural perspective is that of the transition from the agrarian culture context into the modern urban culture context. According to Supriyadi, Sudarwanto, and Werdiningsih (2012), most habitation is still based on rural cultures, which are marked by a simple way of life, sense of togetherness and strong social interaction. Most people generally live on limited land and pay little attention to the physical conditions of their housing (Anggraini, 2012; Tutuko & Shen, 2014). Urbanisation often occurs along riversides, and the issue of spatial arrangement in these limited land areas has been widely discussed, especially regarding densely inhabited

areas. According to Ahmad et al. (2002), due to the small sizes of the plots in their specific case study, the amount of land was inadequate for many households, especially because certain complexes contained inter-family relationships and the number of family members tended to quickly expand beyond the original housing capacity. In relation to limited land, the spatial pattern of human settlement has also been discussed in terms of social norms and cultural settings (Nunta & Sahachaisaeree, 2012; Tutuko & Shen, 2014), its transformation in accordance with modern society (Saleh, 2000, 2001), and human behaviour and satisfaction of living (Cho & Lee, 2011; Lewis, 1997; Marmot, 1983; Wang & Chien, 1998).

Inner city communities, especially those of low income, often require community participation to improve. Such participation is also needed in the construction of residential facilities in rural-urban areas (Njoh, 2011). Several studies have shown the difficulty of aligning the needs of community projects with an effective type of community participation (Abbott, 2002; Lizarralde & Massyn, 2008). The study of improving the infrastructure of residential neighbourhoods on riverbanks with limited land suggests that a positive perception of security is crucial in encouraging people to invest in their settlements (Winayanti & Lang, 2004). Planning and design in poor areas are needed to reduce slums within urban areas. One way to achieve this is to improve residential facilities (Wekesa, Steyn, & Otieno, 2011). According to Majale (2008) and Benjamin, Arifin, and Sarjana (1985), slums and informal settlements are an integral and inevitable part of most cities in developing countries, and they also play a key role in their socioeconomic development. Their significance to the housing of most of the urban poor cannot be overstated.

Planning and design also involve various parties. Aesthetic input comes from architects, but the design process should also be open to input from the community. The formal aspects of architecture have limited application in relation to this independent development process. Coupled with the low quality of buildings and slow construction, independent technical assistance is required (Segaar, 1979). The complexity of aesthetic and environmental significance demands academic oversight. It is crucial for universities to assist in the planning and construction of these residential facilities. According to Kowaltowski (1998), technical assistance should focus on environmental design and home placement guided by knowledge of aesthetic preferences.

The dwellings in the study area, Kampong Muharto (in district 10), known as *kampong*, are the typical type of urban dwellings in Indonesia. Kampong Muharto is dominated by families with children. The neighbourhood of Muharto is located by the river and is strongly influenced by kampong culture, which has resulted in marked deviations from the surrounding city developments. This paper attempts to arrange the facility space in the Muharto neighbourhood with respect to the fact that the community planning and design of this settlement is still dominated by the activities and culture of the residents. The children have no space to play, and the parents do not have a common place to gather. The main concern for the slums, and the starting point for their development, is to address the lack of facilities; this is an urgent problem that can only be resolved through research. It is the slow speed of the development of housing and the environment that causes the area to look "slummy"; this is coupled with the fact that most residents make a living by scavenging trash, although it should be noted that their activities do assist the city's programs in municipal waste management.

This research attempts to arrange this neighbourhood by offering several alternatives for the area, especially with respect to the function of its spaces.

This paper is divided into five sections. The first section explains the background and prior research on housing on limited land, especially in cities in developing countries. The second section focuses on the Muharto neighbourhood specifically, including housing facilities and housing conditions, and maps the environmental conditions in two areas. The third section describes the methodology, data collection, and SWOT analysis. Further explanation is also given about residents' actions in arranging the community facilities. The fourth section discusses decisions on planning and designing residential facilities based on the SWOT analysis. Finally, the conclusion highlights the planned spaces and designs that would provide residential facilities on the limited land.

2. RESEARCH AREA

2.1 Overview

The study area, Kampong Muharto, is in the southeastern part of Malang City, on the eastern part of the island of Java, Indonesia. It is a kampong settlement, an area inhabited by families at a lower economic level and the predominant type of settlement across the city. Kampong Muharto (*Figure 1*) is located within the urban village Kotalama, with an area of 0.86 square kilometres and a dense population of 29,126.

Figure 1. Map of Malang City and aerial view of Kampong Muharto area

The kampong has a population density of 33,867 people per square kilometre. There are 142 districts and 11 sub districts within 1 km of the city centre, adjacent to the public cemetery of Polehan-Kotalama. In the past, no one would have thought that Kampong Muharto would be the neighbourhood it is today as the area was originally mostly filled with the graves of ethnic Chinese residents. Even if there were houses, most of them were made from fragile bamboo and plastic shacks, and the inhabitants were commonly prostitutes and people connected to crime. With the expiration of the contract period on the tombs, many newcomers began to arrive and live there. They came from different regions in Indonesia, such as Madura (Madurese), Sumatra (Sumateranese), and other areas. The immigrants there were serious about improving the image of the kampong area.

With this as the historical backdrop, the government and community were committed to improving the area for habitation. This study on the settlement

was undertaken to offer options for reconstruction of the Muharto area in district 10 specifically. The improvements focused on environmental aspects and the arrangement of the Muharto facilities, such as parks and streets for the general improvement and beautification of Muharto.

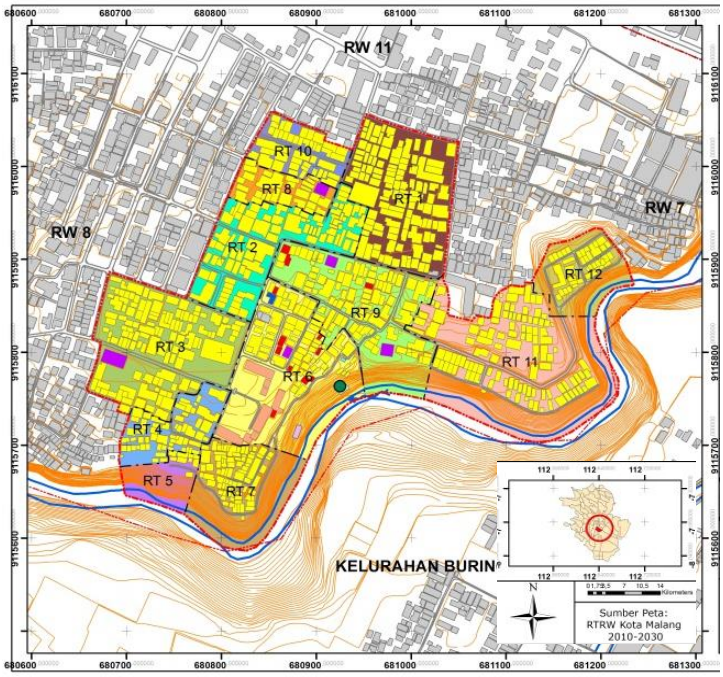

Figure 2. District 10 of Kampong Muharto

The selection of district 10 in Kampong Muharto was based on its high density of buildings, which have made it difficult for the government and the community to develop the area, despite the community's interest in improving the environment. Due to this lack of development, there has been a gradual decrease in the number of people who live in district 10 (Figure 3 and Figure 4).

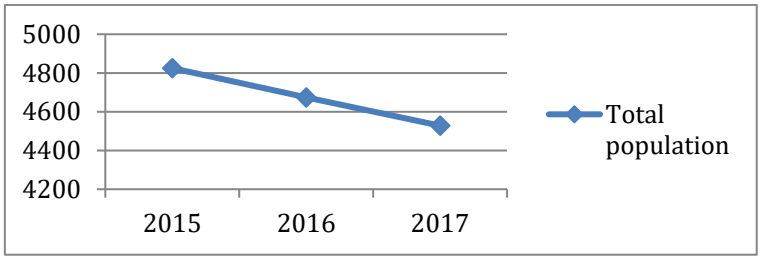

Figure 3. The population of District 10, Kampong Muharto.

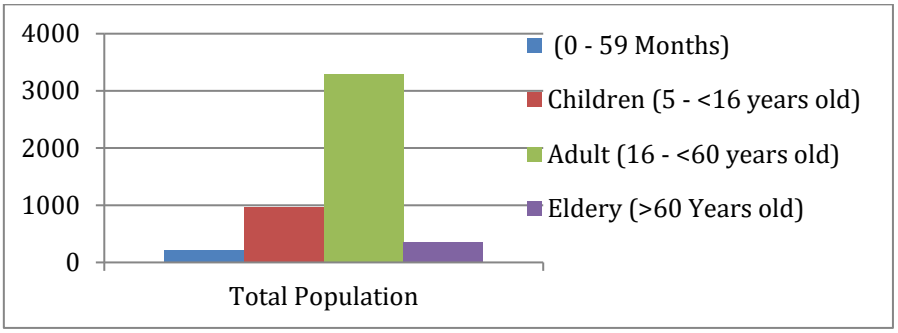

Figure 4. Graph of Population by Age in District 10, 2016

2.2 Housing Conditions

The local government encourages people to participate in city waste management by collecting recyclables from refuses. After several years in the program, the community has increased in size and has begun formally organising its participation. Due to this, Kampong Muharto has become known as the “scavenger kampong”. Collected items are kept in front of homes in preparation for being sent to the collection centre (*Figure 5*). Workers going to the market frequently crowd the Muharto area, creating traffic jams on the road to the Kebalen Market. This area is also an alternative route to the south and east of Malang. Jalan Muharto will soon have an entrance and exit toll road for Malang-Pasuruan, although the process of land acquisition for the project is ongoing.

The road has a bridge connecting the Muharto region with the city over the Brantas River. On the Muharto bridge, garbage is often found at the edge and near the river as well. Garbage collects on both sides of the bridge, adding to the degraded environmental conditions, although no one has ever been caught for the offense of littering there (Figure 6).

Figure 5. Housing conditions: residents put their collected goods at the front of their house. It contributes to a bad aesthetic for the house and neighbourhood (Source: Photos by Aldira and Andika)

Figure 6. Housing conditions: most of the houses are incrementally built. People develop their houses gradually based on their financial capacity at the time. (Source: Photos by Aldira and Andika)

The local government did not provide infrastructure development in all areas in District 10, because development near the main road has been the

priority. Physical conditions on the north side of the district are relatively good. Malang city has a tropical climate, so high rainfall often causes flooding, especially in the low-cost housing areas, so the use of paving materials in the district has been very helpful (Benjamin, Arifin, & Sarjana, 1985; Sedyowati et al., 2017). The entrance to the district is clean and good quality, as the road is paved with asphalt. Paving blocks are also used on the narrow streets (width of 2-3 meters) in this area. There is a sufficient supply of electricity and water in this district. On the south side, however, the areas along the riverside lack adequate infrastructure and residential facilities.

A long time ago, before the eviction of residents from the banks of the Brantas River, this kampong was mostly bamboo forests and Chinese tombs. According to local residents, there was an assumption that the land was haunted and the area was a dumping ground for the bodies of murder victims, however, after evictions along the Brantas River, these settlements managed to attract people. Even so, this kampong is considered a slum because most of the people work as scavengers and beggars. The area has historically received minimal attention from the city government.

2.3 Housing Infrastructure and Facilities

The Government of Indonesia, in its effort to improve the quality of housing, applies the concept of "100-0-100". The 100-0-100 targets were introduced by the Ministry of Public Works and detailed in the Long Term Development Plan 2015-2019. The targets are 100% access to water for drinking, 0% slum areas, and 100% access to proper sanitation. Facilities and infrastructure that exist in Muharto do not currently achieve this goal because the environment does not have proper waste management, streetlights and ditches, and the roads area are also in a state of disrepair. Meanwhile, facilities supporting homes in this area include only one public bathroom, a small mosque and a common septic-tank (*Figure 7* and *Figure 8*). Moreover, there is no children's playground.

Figure 7. The poor condition of the community washroom, sometimes also used for laundry. (Source: Photos by Aldira and Andika)

Figure 8. The conditions of a small mosque used by the community. (Source: Photos by Aldira and Andika)

The conditions in Kampong Muharto are, in fact, common in neighbourhoods across Indonesia. Public facilities are the concern of city governments, but the cleanliness of the living environment is also a public concern.

2.4 Mapping Environmental Conditions

This research focuses on two sections of Muharto. Section 1 is an area with no streetlights and damaged roads with waste litter. The neighbourhood looks dirty because the majority of residents are waste pickers and they place their collections in front of their houses (*Figure 9*).

Environmental conditions in Section 2 of the kampong indicate that the road mostly has no pavement, so if it rains, the road will easily become muddy and dirty (*Figure 10*). The road is also very narrow between the two rows of houses. The narrow roads make the supply of building materials difficult, but they also facilitate socialisation amongst the people.

*Figure 9.*Section 1, the location near the riverside. (Source: Photos by Aldira and Andika)

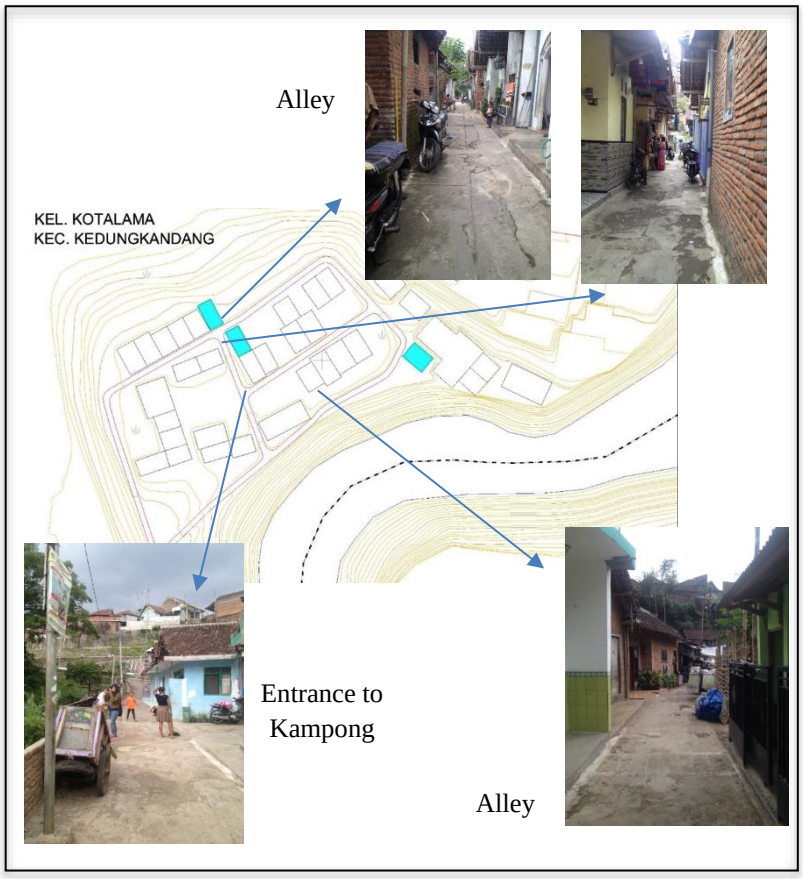

Figure 10. Section 2, the location in the middle of the kampong. (Source: Photos by Aldira and Andika)

3. METHODOLOGY

The research approach used in this study is based on descriptive qualitative research methods. Qualitative research aims to understand the holistic experience of the study subjects, through their behaviour, perceptions, motivations, and actions. The descriptive qualitative research method in this study is used to describe the location, as it relates to 1) the conditions of the infrastructure in the settlement, 2) the provision of infrastructure and the parties involved, and 3) the factors that affect the conditions of slums in Kampong Muharto.

3.1 Collecting Data

The data in this study is collected in various ways, specific to the required information. 1) Interviews are used to obtain data and information from individuals living in the vicinity of the environment (Questionnaires are used as the main interview method in this study); and 2) Documentation of data from the questionnaire as well as a photo collection, which supplements the primary data obtained through the interviews and observation.

3.2 Data Analysis

The method of analysis used in this study is the SWOT analysis method. Attributes are categorised as: 1) strengths, which are advantageous attributes of the planning area that have not yet been maximally utilised or that have been neglected; 2) weaknesses, which are negative or compromising attributes of the planning area; 3) opportunities which are broader positive possibilities that may be exploited on a future urban-rural/regional scale; and 4) threats, which are largely external factors that threaten the success of implementation.

Table 1. SWOT Analysis

No	Aspects	Descriptions
1	**Strength**	• Kampong Muharto had traditionally been the location of the tombs of Chinese Indonesians • Strategic location • Communities have good community work as scavengers and traders. • Kampong Muharto is on the government agenda for the Kampong Improvement Project 100-0-100
2	**Weakness**	• The absence of vacant land for public facilities • Minimal supporting facilities • Poor utilisation and not well organised • Minimal public awareness of hygiene • The river banks in this area have not been well managed
3	**Opportunity**	• Rearrange residential areas • Improve existing facilities and infrastructure • Create solutions for public facilities on limited land • Create open space for people to gather for daily activities
4	**Threat**	• Difficulties transporting construction materials to location • Unstable funding for development • If it is needed, community relocation is rarely an option

Based on the SWOT analysis, decisions can be made over which parts of the environment require spatial adjustment. This decision also considers the needs and availability of land that can be allocated for facilities.

4. RESULT AND DISCUSSION

The decision over spatial arrangement in Kampong Muharto is based on this SWOT analysis (*Table 2*), which shows requisite development.

Table 2. SWOT Analysis Result

	OPPORTUNITIES	**THREATS**
ASPECTS	• Strategic location as a service centre • City administered facilities for kampong • Cultural activities, such as carnivals, often held in the region.	Fear that the Brantas River will overflow into the housing area

STRENGTHS	**STRATEGIES S - O**	**STRATEGIES S - T**
• The potential for vertical development, facilitating more homes • Potential location for parking development	• Develop as a green area • Create cultural events	• Improve decent infrastructure and ensure user comfort, safety, and attractiveness • Create more frequent events to increase the area's attractiveness
WEAKNESSES	**STRATEGIES W - O**	**STRATEGIES W - T**
• Build density is high, with building coverage approaching 100%. • Absence of unity of building theme in the region • There is no temporary garbage collection • The lighting is less than adequate • Benches and public seating is less organised and not well maintained. • Open space is not maintained	• Organise areas with contextual themes related to the environment • Organise public benches and seating areas • Arrange street lighting so as to ensure security • Create an open space for children	Create integrated, safe, and comfortable thoroughfares

4.1 Section 1

In Section 1, the planned and designed area could make use of local materials, as local natural materials greatly assist in the sustainability of facilities to be used for the next generation (*Figure 11* and *Figure 12*).

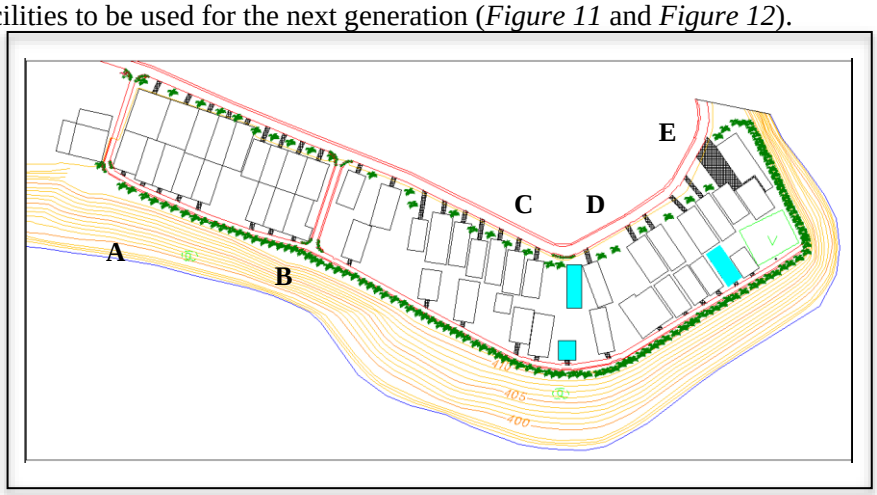

Figure11. Planning for Section 1

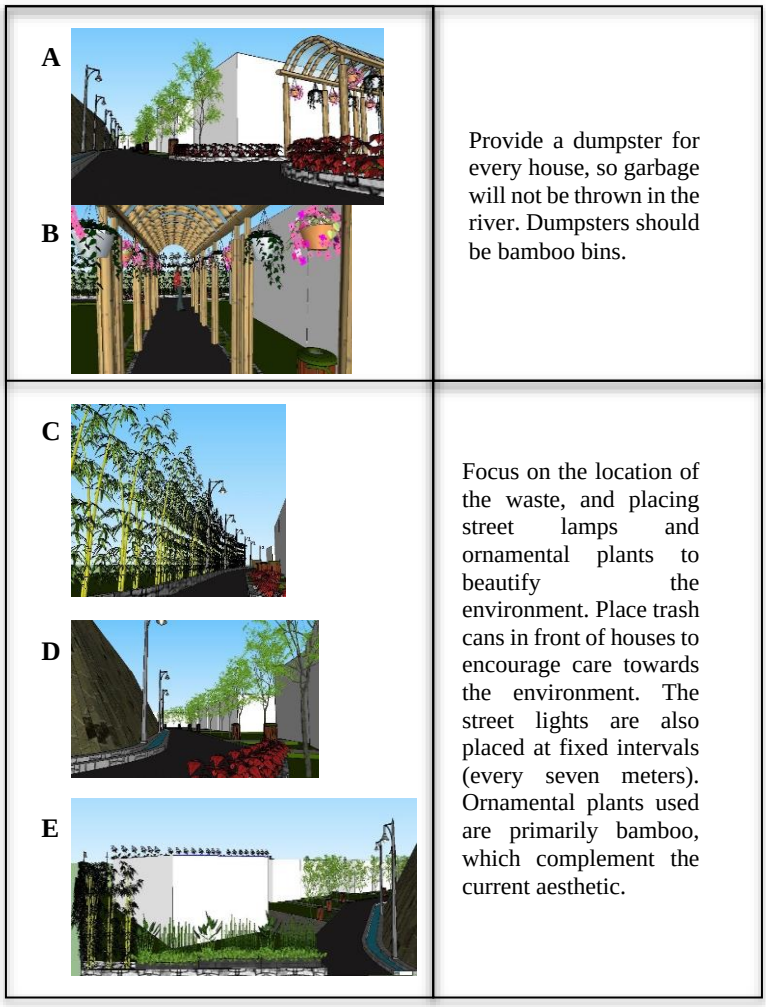

Figure 12. Planning decisions for Section 1

4.2 Section 2

This park area is made up of 2 zones (*Figure 13*, *Figure 14* and *Figure 15*). Adjacent to the waste collection area is an open space for training people in recycling garbage. This garbage receptacle is made of bamboo material, which is easy to access. The selection of bamboo plants around the park further serve as a shade garden and offers soil reinforcement along the steep topographical contour.

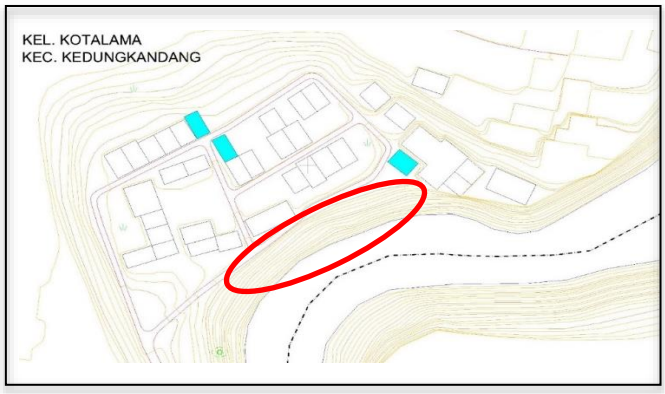

Figure 13. Planning for Section 2

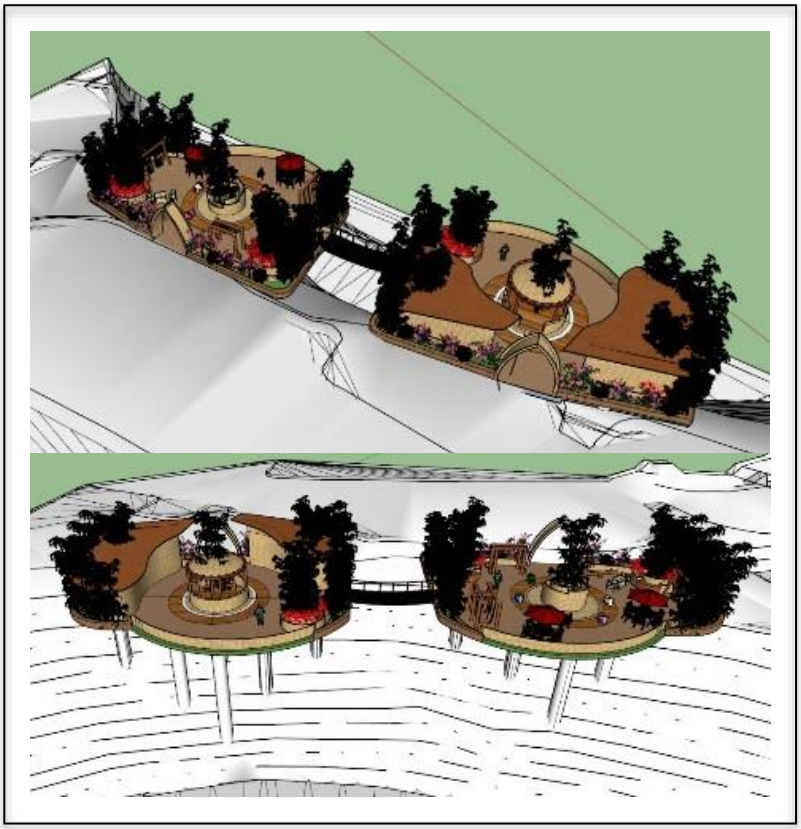

Figure 14. The riverside garden is a concept of a child-friendly park design

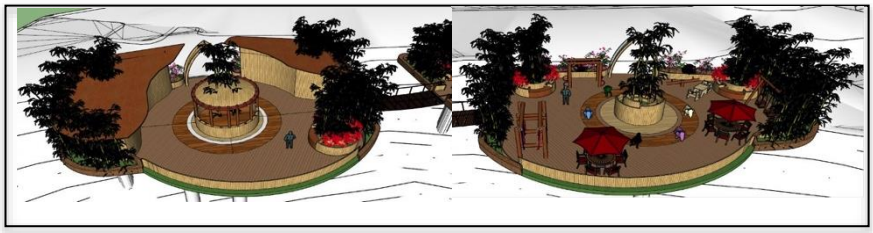

Figure 15. Two types of park

Figure 16. The design of temporary garbage disposal facilities and the construction of riverside roads

Children's playgrounds include swings, seesaws and other equipment common in playgrounds. Seats are provided for parents to watch over the children while they are playing. Spatial arrangement decisions in the planning and design facilities of Kampong Muharto (*Figure 16* and *Figure 17*) provide an alternative solution to traditional problems in the area. Residents of all ages can enjoy the environment comfortably and safely, especially children. By

improving the environment and providing a playground for children, it is hoped that the area once known as a slum will be a clean and comfortable area.

Figure 17. Design for neighbourhood roads and playgrounds for residents who can take advantage of riverside access and river views

The planning and design of residential facilities in poor areas requires consideration of the location of the facilities to be built, the activities of the people there, and the limited land conditions on the riverside. The results obtained required meaningful discussion between academics and affected residents.

5. CONCLUSION

Given the challenges of land constraints and the maintenance of environmental quality, there is a required intensification of community cooperation with academics in the planning and design of residential facilities. Through the SWOT analysis method, inputs-and options were offered to solve problems regarding the selection of plans, designs, locations and themes in line with the location and activities of the region. Mutual understanding is needed in the planning and design of residential facilities on limited land, especially on riversides.

Despite the limitations of the land, most of the inhabitants still work, mainly scavenging recyclables. With the increasing development of the city, Kampong Muharto faces a situation in which the city needs to meet the needs of all its residents. An understanding of the relationship between space requirements and residents' activities is needed. By understanding the spatial arrangement of housing, geographic condition and population growth, the best spatial arrangement for residential facilities can be realised. This study is expected to help respond to the rapid growth in urban areas, where problems often arise in residential areas. The planned and designed facilities are expected to provide solutions to similar conditions in other cities, especially in densely populated areas with limited land located on riversides.

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