

Physical Environment Upgrading for Riverbanks Settlement in Sungai Jingah Urban Village, South Kalimantan

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ABSTRAK: *The purpose of the research is to explore the strategies to improve the settlement of riverbanks area through upgrading the infrastructure. Further, this work defines efforts to develop an upgrading strategy in physical environment in the riverbanks area of Sungai Jingah urban District, because the river functions more as a backyard, a place for bathing, washing and garbage disposal. As a result, the identity of the river is only as a service place or back territory. This study reveals that the most important aspects of physical improvement in slum areas such as improving and installing basic infrastructure like drinking water, sanitation, solid waste management, and green open space. The proposed design strategies should be directed to planning physical environment without neglecting the uniqueness of the community culture and the role of Sungai Jingah urban village in shaping the Banjarmasin city. Physical Improvement are needed to improve the quality of Riverbanks settlements so that the whole settlements become better and safer to live in.*

Keywords: Physical Environment, Riverbanks Settlement, Slum Upgrading

INTRODUCTION

The geographical condition of Banjarmasin, which has many rivers and is eventually called “the City of a Thousand Rivers”, affects the shape of the settlements pattern on the riverbanks. The arrangement of the riverbank area is an inseparable part of urban planning, moreover rivers are an important part of the life of the surrounding community. The character of the settlement in Sungai Jingah Urban Village, which traditionally still relies heavily on the use of the river as a source of bathing, washing, disposing of garbage, also contributes to this decline in environmental quality and reduce city visuals which affect several problems, such as a lack of sanitary facilities, waste management facilities, and water supply. (Sarwadi, 2002).

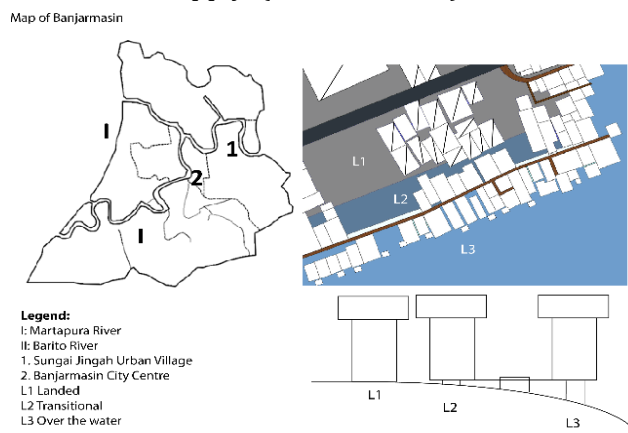


Figure 1. Location of the target area

Source: Author

The habit of throwing garbage everywhere, including into the river, is a local community habit because of the lack of socialization and regulations from the local government. Planning part of the city area but neglecting the zoning of river banks, can create slum settlements along river banks and contribute to environmental damage. This is because buildings along the river cause various environmental problems, such as household waste that is directly dumped into the river (Prayitno, 2013).



Figure 2. Condition of the target area

Source: Author

As the embryo of urban development, the riverbanks area has a unique and dynamic architectural appeal, and the traditional culture of the people is able to create a built environment with a distinctive character. This uniqueness is an opportunity to present images in urban space architecture. There are two main things that underlie the arrangement of the Banjarmasin riverbank area, which are the settlements and the tourism. Physical environmental problems due to not being accommodated for the needs, activities, and habits of the people in riverbank settlements have resulted in the emergence of new slum areas such as untreated waste problems, disposal of waste water from households has not been completely effective, washing and drying areas which have not yet accommodated the needs of the community, jetty implementation are not optimal, there is a lack of public space for local people to gather, and lack of green area along the river banks.

Based on these conditions, it is important to know the characteristics of riverbank slum settlements to then study creative alternatives that may be appropriate in structuring the riverbank slum areas. It is hoped that from this research, the identification of characteristics and arrangement concepts that can be implemented in riverbank slum areas will be identified, especially through an environmental-based architectural design.

Research Problem

What strategies or improvement plans to improve the physical environment of riverbank settlements, without neglecting the culture of the local community in Sungai Jingah Urban Village?

Research Aims

This study aims to describe the basic concept of physical improvement of slum areas on the riverbank as a step to assist the government in the success of the local government program and to set standards in its realization process so that the results of the program can be felt equally by all community audiences. The improvement plan in this study focuses on planning physical environment by maintaining the culture and uniqueness of its community and the role of the Sungai Jingah urban village in shaping the North Banjarmasin City and be part of it into a unified whole.

LITERATURE REVIEW

Physical environment upgrading in the riverbanks area

(Goenmiandari et al., 2010) stated in his research that the concept of structuring riverbank settlements in the city of Banjarmasin was compiled from the criteria for riverbank settlements based on the river culture with structuring forms in several riverbank areas in other areas. The riverside settlements of the city of Banjarmasin need to be arranged so that the preservation of cultural values is due to the uniqueness of life related to the interaction and dependence on the river. The concept of settlement is obtained from an analysis of the river culture of the residents of the riverbanks of the Jingah Banjarmasin including: the concept of the river transportation system, economic activities on the river, settlements on the riverbanks and river environmental control. The four concepts are interrelated.

Michiani, 2019 revealed in his paper, improving the physical environment or settlement infrastructure is the most important aspect in dealing with slum settlements, especially in riverbank areas. The basic concept of physical upgrading of slum areas consists of 3 important elements: (1) Organize the road network as the fundamental system that makes up settlements; (2) Develop public utility systems that are important for people's live, such as drinking water, sanitation, solid waste management, and the existence and quality of jetty; (3) Provide open spaces and shared facilities that develop senses, form identity, and reveal the visual charm of the location. However, in the Sungai Jingah urban village area, for road access the local government has just repaired road facilities with cement material measuring 1.5-meters about 2 months ago, the road can be accessed by pedestrians and motorized vehicles. However, the biggest problem seen in this area is solid waste, however the government has not taken any action in addressing this. In fact, the provision of household waste disposal facilities is also very important, given the dangers posed by dumping waste into rivers to water conditions and public health conditions. Many dangerous things are intertwined if the government continues to allow people to dispose of household waste into rivers and does not provide adequate facilities to solve the problem.



Figure 3. Local government project in Sungai Bilu
Source: Google Images

Local government existing project: Sungai Bilu

One of the efforts to improve the quality of settlements in the riverside area by the Regional Government is the arrangement of the Urban Environmental Building for the Traditional Waterfront Village Area of Banjarmasin City. This waterfront traditional village arrangement is a river bank settlement area arrangement program from the local government which in the future can be used as a tourist area by raising the distinctiveness and culture of the river in Banjarmasin City. As a pilot project, this traditional waterfront village arrangement is located in Sungai Bilu Village. However, according to (Rahman, S. et al, 2019), the arrangement of slum areas that have been carried out on the riverbanks in the Sungai Bilu Village is still not optimal due to the fact that the face of the area has not been able to provide orderly beauty and greening, and has not accommodated needs the behavior and activities of the riverbank community. According to (Rahman, S. et al, 2019) from the results of his research, it was found that the conceptual formulation for the arrangement of riverbank slum areas in Sungai Bilu Village, namely: (1) Arrangement of settlements by taking into account the characteristics of the residential function and mass structure of waterfront buildings as well as improving the appearance and feasibility of residential buildings; (2) Returning the river element in the form of a walkway as settlement accessibility is accompanied by an increase in the quality and infrastructure; (3) Management of river environmental sanitation by developing a communal wastewater treatment system and controlling river waste with trash block filters and planting vegetation as a buffer for waste (4) Processing of empty riverside lands as RTH, providing public spaces in the form of recreational and community spaces, structuring parking area, as well as additional pier access for public transportation, buying and selling activities and river transportation; (5) Development of the local economy of riverbank communities by providing trading space facilities that adopt the form of a Stilt house as a building adapted to the river; (6) Confirmation of land and building layout regulations as well as implementation of regional regulations on solid waste in river environments.

RESEARCH METHODS

This research is a qualitative-analytic descriptive study through an environmental-based architectural design approach and considering the principle of slum upgrading.

Research Steps

1. Initial field survey. The research begins with data collection by a direct visual observation survey of riverside settlements in Sungai Jingah urban village along the Martapura river.
2. Identify the elements to be studied.
3. Select and prepare tools.
4. Creating the data collection steps, delineating the pattern of the research area and physical views (photos and drawings) as well as mapping land use and identifying the area's spatial pattern.

The course of research

This research begins by collecting secondary data, in the form of literature, a map of Banjarmasin City and a map of the research location as well as data from related agencies and local people in the area.

Analytical Method

The qualitative-analytic descriptive method of analysis is based on the mapping of spatial physical objects in the form of direct observation survey, interviews with local community and data from literatures. This method facilitates visual understanding of the research area.

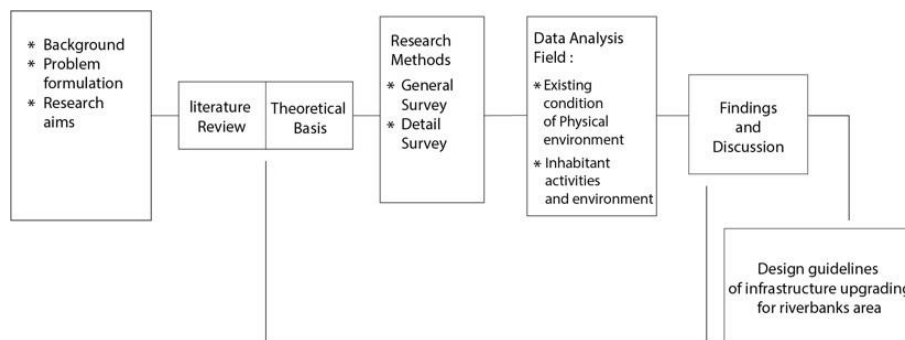


Figure 4. Research Method Process

Source: Author

RESULT AND DISCUSSIONS

Inhabitant and Living Spaces

Sungai Jingah urban village is an old village which is part of the early history of Banjarmasin city development. Along with the development of residential cities began to grow in mainland areas, especially with the construction of land roads. Settlement patterns are formed because of culture concerning the way of life, how to adapt to nature and the environment and the demands of meeting needs. The discussion regarding the data

obtained from interviews and direct observation after being analyzed descriptively qualitatively produces the factors that cause the association of residents of riverbank settlements with rivers: (1) river transportation activities, this is influenced by the fulfillment of the facilities and infrastructure, (2) economic activities of rivers and including them as an economic source, (3) activities of bathing, washing, latrines and solid waste (4) social and cultural activities, (5) the need for the fulfillment of clean water and drinking water. However, at present the binding factor that remains is meeting sanitation needs and the provision of clean water for bathing and washing.

Table 1. Inhabitant and Living

	Description	
Origin	Original inhabitants	
	Outside Sungai Jingah Urban Village	
Housing type	Out of the city	
	Semi-stilts	
Utility	Stilts house	
	Drinking Water	State drinking water supply
		River
		Retail
		Share
	Electricity	State-owned electricity company
		State-owned electricity company (share with neighbour)
	Water pipe	Installed
		Uninstalled
	Sanitation pipe	Installed
		Uninstalled
	Latrine	Private without septic tank
		Private with septic tank

Source: Author

Table 2. Inhabitant and Activity

	Description	
Interaction with river	Types of activity	Taking water
		Washing
		Trashing
		Chill out
Interaction with neighbour		Transportation
		Chatting
		Event
Washing place	Body	Meeting
		House
	Clothes	River
		House
	Dishes	River
		House
Place of children activity		River
		House
		River
		Alley
		Footpath road

Source: Author

Environmental Utilities

In the riverbank communities, their habit of disposing of their waste water is without prior management so that it is immediately discharged into the river. Most of the washing water and kitchen waste are discharged directly into the river, as well as the presence of bathrooms and toilets that drain directly into the river. If this is done continuously, it will pollute the environment. In Sungai Jingah Urban Village, there are still some houses doing this. Garbage is the main problem in this area, because of the habit of people who throw garbage out of place and also throw it directly into the river. For those in the Landed and Transitional areas, littering greatly affects the visual of the settlement.

In addition, the absence of an optimal waste transportation system and the absence of a garbage disposal facility makes people reluctant to throw garbage in its place. Of course, this is a concern, considering that waste is a very influential visual indicator of potential slum.



Figure 5. Sungai Jingah Village conditions
Source: Author

Environmental Infrastructure

Environmental infrastructure is an important element in supporting the daily needs of the economy, therefore the better the infrastructure, the better the community's economy, because if accessibility conditions are poor, it will hamper the economic pace of a region. Likewise, with settlements on river banks, the existence of environmental infrastructure in the form of road and jetties accessibility is really important. In the riverbank settlements in Sungai Jingah Village, the accessibility of the neighborhood roads is in the form of roads that have been cast and walkways. The main road access is quite good because the local government has made road repairs 2 months ago, but access to houses that are located deeper still uses a walkway which is partly in poor condition and disturbs the visuals in the riverbank residential area of the Sungai Jingah urban village. Jetty is a very important facility in a river-based city. The river is used as a means of transportation for goods and daily transportation for the community. The finding in this target area is that there is only 1 pier at the end of the settlement, so that residents tend to stop directly at their respective homes using floating MCKs as piers, stage toilets and trunks on the riverbanks close to the destination as land access and to the river. This can endanger residents. So that the concept proposed is the addition of a dock in the middle of the settlement to facilitate access to public transportation.

Community Space

The need for public facilities and social facilities is also very important in slum management, especially in riverbank areas. The availability of adequate public open space is useful for supporting social, economic and public transportation activities. River border

spaces that are planned as Green Open Spaces can be developed into recreational spaces and community spaces that are very contextual with the current riverbank environmental profile. Recreational space can be in the form of attraction spaces or children's play areas that can increase the crowd and outdoor activities of the residents of the riverbanks, because the current condition of children playing on the main road is so disturbing the activities of pedestrians and motorcyclists. Community space plays a role in accommodating community or group activities in the form of discussion rooms, performance rooms or stages, or just gathering spaces.

Recommendations for the Concept of Physical Environment of Riverbank Slum Settlement in Sungai Jingah Urban Village



Figure 6. Recommendation for Physical Environment upgrading strategies
 Source: Author

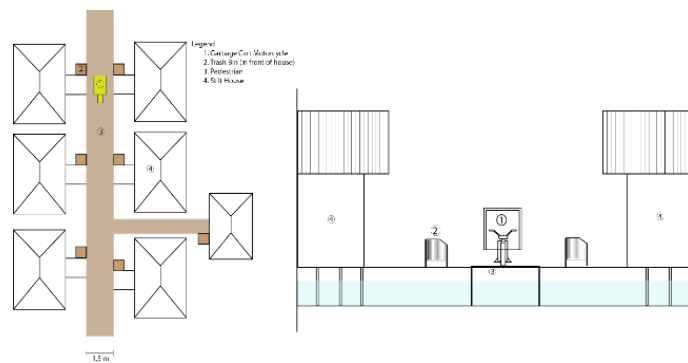


Figure 7. Detail of Garbage Disposal Upgrading
 Source: Author

The formulation of the river bank settlement arrangement concept in Sungai Jingah Village was obtained based on the results of the analysis of the identification of the

characteristics of the slums of the riverbank settlement. Therefore, the concept of arrangement of riverbank settlements in the Sungai Jingah Village is a compilation of relevant sources of theory, namely the basis / criteria for the arrangement of sustainable riverbank areas obtained from literature studies, the form of arrangement in several riverbank areas in other areas.

Table 3. Recommendation for upgrading concept

Variable	Existing Condition	Structuring Action Plan Strategy
Walkway/ Street	The main road access is good enough because the local government has made road repairs.	Need to add a fence to protect the river area
		Need to add street lighting on the street for activities at night.
		Need to add a pergola accompanied by vines for shading and greening.
		Community assistance and outreach in supervision and environmental infrastructure maintenance
Jetties	There is only 1 jetty at the end of the settlement, so the community tend to stop directly at their respective homes using floating MCKs as jetty, stage toilets and trunks on the riverbanks close to the destination as land access and to the river.	Provision of jetty access and boat moorings at several points as a stopover area from rivers and public activities.
		In the jetty area, it must be equipped with vines for shade and greening
Garbage Disposal	Mostly, the garbage directly throws in the river because there is no system or regulation that accommodate the garbage disposal system.	Improved solid waste services in residential areas according to standards, namely by adding trash bins in front of the entire house, then every day there is a garbage collection motorbike that will take it to the nearest garbage dump
		Control of river waste by installing trash blocks or nets along the river walkways to prevent trash from being sent and cleaning it regularly.
		Planting typical riverbank vegetation as reforestation and buffer against river waste.
		The establishment of an organization to collect waste in the environment is handled by the local community.

		Increase public understanding of clean and healthy living habits (PHBS).
		Increase public awareness of throwing garbage on place, and affirmation of the prohibition of throwing garbage into the river.
Green Public Space		It is necessary to develop public facilities for residents as a recreational or community space, in the form of a stage/ attraction space, a playground, a viewing tower, or a gathering/ discussion room shelter.
		Planting typical riverbank vegetation along the riverbanks for reforestation.
Public Utility System	There is no special facility for public utility services so that the source of clean water and drinking water does not meet health standards.	Provision of public utilities to provide clean water, drinking water, and electricity facilities which are then distributed to residents' homes to ensure that public health and comfort facilities are met.
Bathing, washing, and latrine		Designing a washing pool for bathing and washing as a habit of the riverbank community in response to the river culture with a standardized sewage system.
		Build a floating toilet for the toilet above the river
		The source of clean water comes from public utility facilities

Source: Author

CONCLUSIONS

The characteristics of the physical environment in the slum settlements on the riverbanks of the Martapura river in the Sungai Jingah Urban Village can be seen from two aspects which include (1) physical aspects, which consist of: the function of residential buildings, environmental utilities in conditions of incomplete waste water treatment, and waste management is still minimal, especially regarding the problem of river waste; environmental infrastructure is a walkway as the main circulation in inadequate conditions; public/social facilities have not accommodated people's needs and the unavailability of parking lots and RTH; and (2) non-physical aspects, which consist of: the economic status of the majority of low-income households, the livelihoods of the population, and local and cultural activities that have been attached, and the influence of river culture which still uses the river for bathing and washing activities.

The results of the conceptual formulation for structuring the physical environment of the riverbank slum area in Sungai Jingah Urban Village are: (1) Application of a solid waste management system and application of waste area regulations to the river

environment. (2) Management of river environmental sanitation by developing a communal wastewater treatment system and controlling river waste by using trash block filters and planting vegetation as a buffer for waste, storing public utility facilities to ensure public health and safety; (3) Processing of empty riverside lands as green open spaces, providing public spaces in the form of recreational and community spaces, as well as adding jetty access for river transportation; creating a washing pool as an adaptation to the culture of the riverbank residents. (4) Returning the river element in the form of a walkway as settlement accessibility accompanied by an increase in the quality and infrastructure;

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REFERENCES

- Bappenas, 2014. National Policies and Programs, Handling Slum Settlement 2015-2019 [National Policy and Program, Handling Slum Settlement 2015-2019]. *Ministry of National Development Planning / National Development Planning Agency*. Launched in Jakarta, 22 December 2014. (In Indonesian)
- Department of Spatial Planning, Cipta Karya and Housing of Banjarmasin City. (2014). *2014 Final Report of the Preparation of Slum Identification of Banjarmasin City*. Banjarmasin.
- Goenmiandari, B, 2010. The Concept of Riverbank Settlement Arrangement in Banjarmasin City is based on Local Culture. *The 2010 National Seminar on Housing Settlements in City Development*.
- Michianni, 2019. Physical Upgrading Plan for Slum Riverside Settlement in Traditional Area: A Case Study in Kuin Utara, Banjarmasin, Indonesia. *Frontiers of Architectural Research*. Vol 8, Issue 3, pages 378-395. DOI: <https://doi.org/10.1016/j.foar.2019.03.005>
- Mentayani, I, 2019. Identity and Existence of Riverside Settlements in Banjarmasin. *In Proceedings of the National Seminar on Wetland Environment* (Vol. 4, No. 3, pp. 497-502). (In Indonesian)
- Prayitno, B., 2016. *Innovative Scheme in Handling Slum Settlement*. Gadjah Mada University Press, Yogyakarta. (In Indonesian)
- Wulandari, A. P., 2009. The Slums at the Riverbanks and Challenge for Cultural Change, in: *Informal Settlements and Affordable Housing, Sustainable Slum Upgrading in Urban Areas*, pp. (III) 41- (III) 51.
- Rahman, S. et al, 2019. The Concept of Arrangement of Riverbank Slum Settlement in Sungai Bilu Village, Banjarmasin City. *EnviroScientiae* Vol. 15 No. 3, November 2019 Page 397-414. DOI: <http://dx.doi.org/10.20527/es.v15i3.7434> (In Indonesian).
- Sarwadi, A., Tohiguchi, M., Hashimoto, S., 2002. Study on the Improvement Process by Inhabitants in an Urban Riverside Settlement, A Case Study in the Musi Urban

Riverside Settlement, Palembang City, Sumatra, Indonesia. *Journal of Architecture, Planning and Environmental Engineering, AIJ*. No. 556, 297-304.

Kurniasih, D., Mentayani, i., Hartati, l., Abidin, Z., 2019. Analysis of the Implementation of the Settlement of Slum Settlements in the Region One (1) Plan of Banjarmasin City, North Kuin - South Alalak - Central Alalak - North Alalak. Lambung Mangkurat University.

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