

Innovative Public Space Design along Kalimas Riverbank based on Behavior Observation

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Abstract— Kalimas riverbank around Genteng Kali has been partially developed by the city government. The development, while successful in improving the visual quality of the area, has not been able to accommodate various activities of the local residents and visitors alike. This results in scattered activities around the area, notably along the riverbank, that can potentially be a problem to the area environmentally, socially, and economically. This research studied the various activities along Kalimas riverbank in Genteng Kali based on behavior observation to create an innovative design of public spaces to best accommodate the different uses and activities.

The result expected of this research is an innovative design of public spaces along Kalimas riverbank in Genteng Kali.

Keywords— *Innovative Design; Public Space; Kalimas Riverbank; Behavior Observation*

I. INTRODUCTION

Surabaya has three rivers with different purposes, Kalimas being the one used mainly for drainage, fishing activity, farming, and tourism activity [1]. Kalimas is a part of Brantas river which stretches 12 kilometers dividing the city from southern Surabaya to the north.

The study area is located in Genteng Kali, in downtown Surabaya. It is close to various activities centers, such as Tunjungan Street, a very lively and busy trading and service center. In addition to Tunjungan, Kali Genteng is also close to Gemblongan Street, Kramat Gantung Street, and Jalan Pahlawan which also serve as trade and service corridors.



Fig. 1. Area of Study

According to Surabaya City Spatial Plan (RTRW Kota Surabaya) years 2014-2034 [2], the area of Genteng Kali will be developed into a trade and service centers, housing and settlement, and government area. The riverside area along Kalimas in Genteng Kali will be developed into local protected area to support environmental friendly tourism and sporting activities. Kalimas riverbank around Genteng Kali has been partially developed by the city government. The development made by the city government while successful in improving the visual quality of the area, has not been able to accommodate various activities of the local residents and visitors alike. This results in scattered activities around the area, notably along the riverbank, that can potentially be a problem to the area environmentally, socially, and economically.



Fig. 2. Scattered activities along the riverbank

A development which focuses on sustainability by optimizing the riverside area to emphasize the identity of Surabaya as a waterfront city has been planned and executed by the city government. Public space, according to Niemann and Werner (2016) [3], is an important aspect of sustainable development in waterfront area along with other aspects such as protection towards environment, unity, and land use. The existence of parks, green area, and accessible promenade along the river is needed to improve the quality of the waterfront area.

Gultom (2012) [4] stated that public access and open spaces that considers connectivity to water, connectivity to the promenade, identity of waterfront area, appropriate public facilities, and equipped with materials that support the local climate can help maintain the quality of the waterfront area. While A Project for Public Spaces (2009)

[5] identified that there are four keys in creating a good public space. The four keys are comfort and image, access and linkage, uses and activity, and sociability. The four keys can be translated into tangible and intangible.

Gomes (2012) [6] explains the factors that influence the public space and determine whether the public space is arguably a good public space. Overall Gomes focuses more on the human and social aspects that he thinks are closely related to the use of the public space.

TABLE I. CRITERIA OF A GOOD PUBLIC SPACE

Souce	Criteria of a good public space
Gultom (2012)	<ul style="list-style-type: none"> - Public access - Connectivity - Identity - Environmental friendly
Gomes (2012)	<ul style="list-style-type: none"> - Possibility - Motivation - Opportunity - Comfort
PPS (2009)	<ul style="list-style-type: none"> - Access and linkage - Comfort and image - Uses and activities - Sociability

The above criteria will be considered as input to create the design of public space along the riverbanks of Kalimas in Genteng Kali.

II. METHOD

This research used behavior observation as a mean to determine the pattern of activity along the riverbank. Behavioral observation analysis is done based on the place and by observing the activity done by the people in the community (visitors and local residents) in each part of the river bank. Place-based mapping is used to find out how the place is utilized by humans at any given time. This method is done to determine the difference between the use of each part of the river bank and to analyze what kind of activities take place in certain area of the river bank and how it relates to the characteristics of the surrounding area.

Observations are made on weekdays and weekends in the morning and afternoon. The decision to do the observations on both weekdays and weekends is because of the function of the area of study as a trading and service area and public facilities that mostly do not operate on weekends, so there is a possibility that activities that occur around the river bank is different on weekends. The morning observation is done around 09.00-12.00 and afternoon observation is done around 15.00-18.00. Consideration of observation time is due to community activities during working hours (morning) and after work (afternoon) may vary. The observations will be recorded in maps and completed with descriptive descriptions.

Observations were made on each part of the riverbank to the activities of two groups of users, the visitors and local residents. Visitors are public space users who do not live in the area and come to the river within a certain amount of time. First of all, places where people gather to do activities along the riverbank will be pointed out. Then the kinds of activities taken place in the morning and evening will be described. From the mapping, it can be seen which part of the riverbank is often visited by people and become the center of activities.

The expected result of this identification of people's activities is to know what types of activities take place around the riverbank, where do they take place, which part is widely used for activities along the river bank, and the reason why those particular places are visited more often.

III. RESULT

Prior to conducting behavioral observations, observation of existing public spaces and public facilities around the area was done on the area of study.



Fig. 3. Existing public spaces and public facilities

From the observation, it can be seen that the intensity and type of activity in each part of the riverbank are different. The intensity and type of activity are closely related to the physical condition of the public space including the public facilities nearby, the presence of shade mainly in form of vegetation, and the condition and the use of the buildings around the area. In general, the spots that are often used for activities are located in public facilities such as Peneleh Park and Siola Building or Cak Durasim. These public facilities attract residents, visitors, and street vendors to come and stay there until late afternoon. The existence of a bench or other street furniture for sitting and resting and trees large enough to provide shading help some spots to serve as a location that is widely used by the community for their activities.

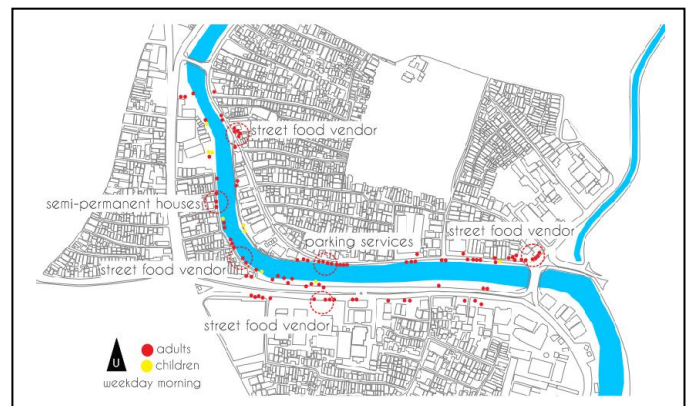


Fig. 4. Activity map for weekday morning

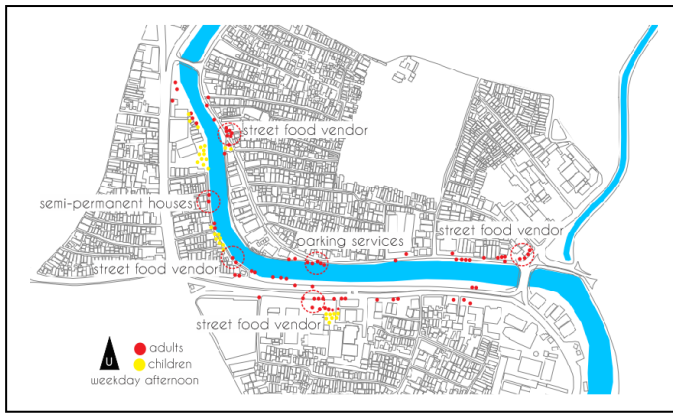


Fig. 5. Activity map for weekday afternoon

The majority of public space users around the riverbank in this area are adults with various kinds of activities such as fishing, trading, waiting, chatting, washing clothes, cooking, smoking fish, and so on. Others are children, both school kids who visit Siola and Cak Durasim and children who live in settlements around the river. Activities performed by children are more limited, such as playing, looking around, and chatting. Social interactions occur mostly in the afternoon on weekdays as well as weekends, especially by locals around their houses where many children play on the street and adults sit around chatting. Visitors were found to be rarely interacting, either with other visitors or with local residents.

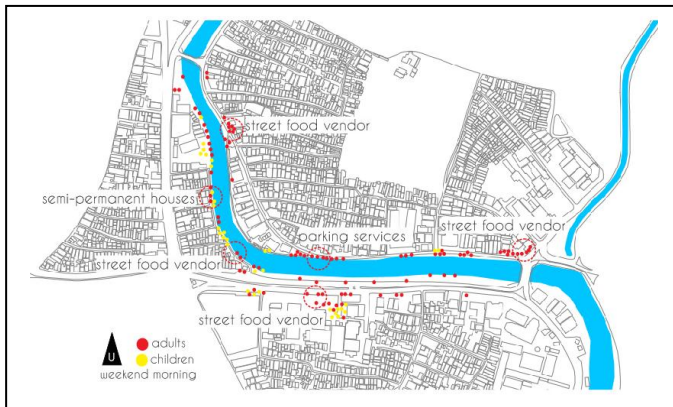


Fig. 6. Activity map for weekend morning

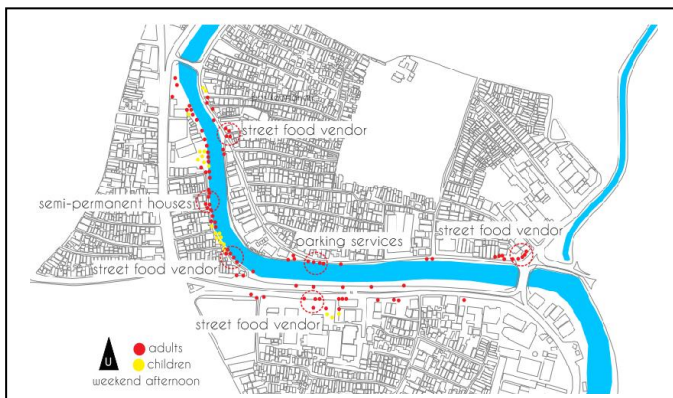


Fig. 7. Activity map for weekend afternoon

The activities of adults and children are still poorly accommodated in some part of the riverbank. Children's activities such as playing still takes place on the road because the existing playground is not adequate. Adult activities such as fishing, chatting (which has been done in stalls or close to street vendors), and waiting around the area of trade and services are not accommodated properly. Some activities done in the settlement area have the potential to cause pollution to the rivers, in where activities such as washing, bathing, cooking, disposing of waste, and smoking fish around the river are performed.

IV. DISCUSSION

A. Design Criteria of Public space along Kalimas riverbank in Genteng Kali

From the observations, some conclusions of can be taken of the characteristics of the activities and its relevance to public spaces along the river banks in this region, as follows:

1. There are several public facilities that act as a gathering point for the community to perform various activities. There are also some places that are not public facilities but have potentials to be a gathering place.
2. Public spaces along the river are available only at some area, namely in Peneleh Park, and a playground near the settlement area. These spaces have not been able to accommodate the diverse activities performed by the community around the riverbank.
3. Utilization of open space as public space is different in each part of riverbank and much influenced by the condition of the surrounding environment. Therefore, the need for public space is also different in each part.

From the observation result, it is known that the priority of need for public spaces and the types of activities that must be contained in each part of the riverbank differ. The highest priority of public spaces needed is on the part that is located near the residential/settlement area. The majority of people who use that particular part of riverbank is local residents who spend their daily lives near the river and do activities on the riverbank every day so public space is a necessity that must be met. On other part, the need for public spaces is aimed more at supporting recreational activities such as fishing and water sports.



Fig. 8. Needs of public space and different activities along the riverbank

Some spaces along the riverbank, especially those in the form of vacant land that currently serves as a gathering place have potentials to be developed as public spaces. The existence of discrete and uneven number of public spaces creates a gap between the users and does not encourage social interaction, whether it between residents, between residents and visitors, or between visitors. Public space design with friendly and accessible impression is needed to attract people to come to come. In areas close to the settlements, public spaces and river are easily polluted so that it needs a a design that can encourage environment awareness among the community.

Design criteria:

1. The design of public spaces around the river should be evenly distributed in each part of the riverbank, and able to accommodate the needs of the community in accordance with the type of activity and age of the users, and can be used by both residents and visitors.
2. The design of public spaces should be able to create a friendly and accessible impression for everyone to attract people to come and encourage social interaction.
3. The design of public spaces should be able to encourage people to take part in protecting the environment.
4. The design of public spaces should consider physical comfort (protected from heat and rain) and mental comfort (feel safe and calm) and support both active and passive activities.

B. Concept and Design

- Public spaces are placed on each part of the riverbank with attention to user activity and requirements according to age and activities performed in those particular area. In residential areas, a playground for children is required, whereas in the area of trade and services a resting area is needed for adults.
- Public spaces are also designed to attract young people to come, because the area of study is located near to the youth center. In the area of trade and services, public space is intended to accommodate passive activities such as sitting and relaxing, while in residential areas, active activities such as exercising, playing, and chatting are prioritized.
- Spatial arrangement of public spaces along the riverbank is emphasized on several spots that are the center of activity. Centers of activity located on the right and left side of the river are linked by the main structural linkage in the form of a pedestrian bridge. The pedestrian bridge is intended to strengthen the connectivity of both sides of the river and encourage movement to both sides of the river.
- Existing big trees are preserved to give enough shade to public spaces to create physical comfort. The public spaces are easily accessible and open for all.

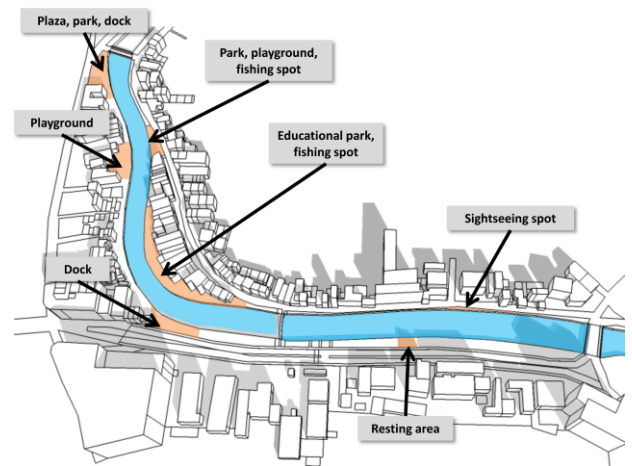


Fig. 9. Public spaces are evenly distributed

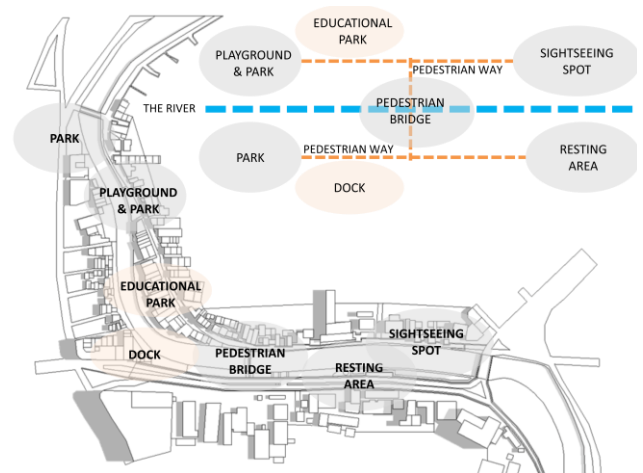


Fig. 10. Linkage of the public spaces

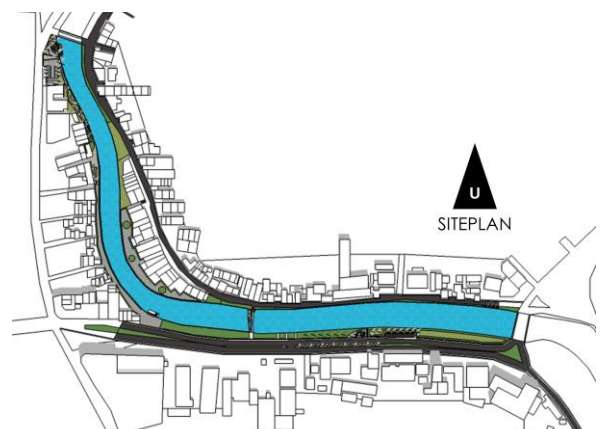


Fig. 11. Siteplan

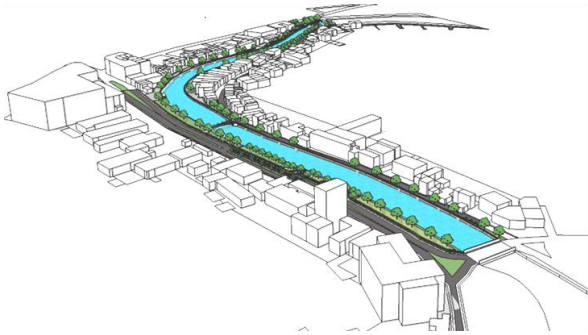


Fig. 12. Bird eye view

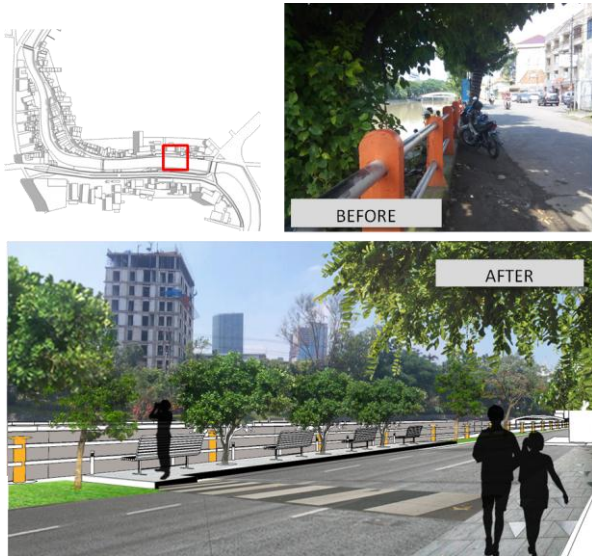


Fig. 13. Details on sightseeing spot

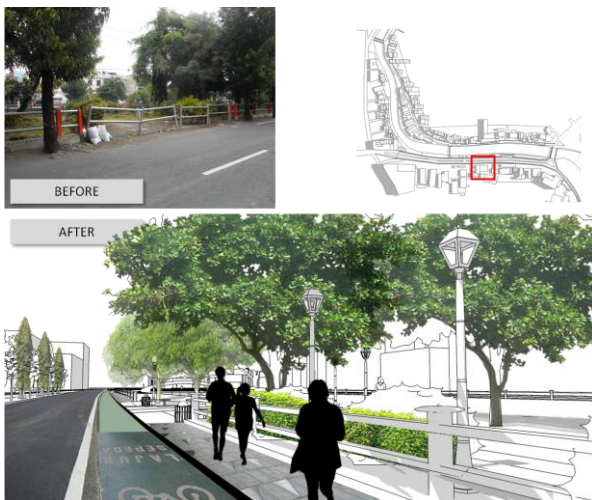


Fig. 14. Details on park

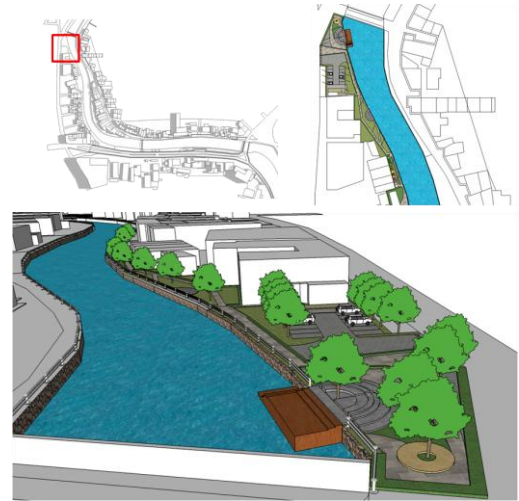


Fig. 15. Details on park and dock

V. CONCLUSION

Based on the results of the research, several conclusions are obtained as follow:

- Riverbank in Genteng Kali has the potentials to be developed into public spaces to accommodate people's activities.
- Each part of the riverbank has different need and activities performed and has to be taken into consideration while designing the public spaces.
- Accessibility and opportunity to be involved in social interaction can be provided by designing friendly and evenly distributed public spaces with strong linkage.
- The design should be created to encourage people to take part in protecting the environment.

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