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THE PRESERVATION OF RIVERBANK SETTLEMENT AS A TOURISM POTENTIAL IN THE CITY OF PALEMBANG, SOUTH SUMATERA

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ABSTRACT

Aim: This study examines the current living culture of riverbank residents by observing the choice of factual house and the house preferences. A house is the physical characteristic of cultural products indicating the current living culture. The riverbank settlements are part of the historical development of the city of Palembang. **Methodology and Results:** This research focuses on the physical form of residential buildings from the perspective of socio-cultural preservation. Restoring the characteristics of the riverbank area is a necessary potential. The design process can be directed toward technical innovation, social aspect and the use of materials that correspond to the features of the area. Furthermore, the cultural ecological interaction has created a living culture in the riverbank. This is evident in the constructed houses of residents with structure, technology, and material conforming to the fluctuating conditions of the ecosystem. The settlement's characteristics generate an image of a river city, which have also become a tourist attraction in Palembang. However, the living culture has changed due to the innovation in building technology, the shift in the focus of development, and the availability of natural resources which diminish these features. **Conclusion, significance and impact of study:** This will encourage tourists to visit the developed areas with a preservation approach, integrating new cultural living with the conservation of the river city features for tourism interest. Furthermore, the preservation of tourism activities are not only unchanged, but also an adaptation flexibility to continuously look for new forms for the symbiosis between man and nature.

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1. INTRODUCTION

The riverbank settlement has become the unique characteristic of riverbank area for the city of Palembang. The communities live on by adapting to these conditions and forming a riverbank settlement community. The riverbank settlement has become part of the city's development history. The long history of Palembang presumably started during the Kingdom of Sriwijaya and developed until the arrival of the Europeans with the discovery of crude oil sources in various points along the Musi River. As the result, settlements were developed along the riverbank varies and have their own uniqueness compared to other river cities in Indonesia (Adiyanto, 2017). Houses evolved along with the increase in trade, service and industry intensities along the riverbank. The settlements are located in the riverbank where major rivers meet connecting strategic trade routes. Although a shift in transportation mode to the mainland has reduced the vitality of the area, the historical heritage was well preserved in the form of houses, some of which are still occupied by the residents.

The downstream area is always inundated with the river overflow, either daily, monthly, or annually. The residents reside in the area by adapting to the ecosystem. Flood and puddle have never been a disruption for their daily routine activities (Braun and Aßheuer, 2011; Rashid, Hunt, and Haider, 2007). The river spreads through a wide and shallow stream. The settlements stand on land with shallow river depth and slow current. The water velocity in the downstream is low because the altitude of the slope is almost parallel to the sea level. The residents utilize the ecosystem condition by taking advantage of its proximity to the source of water, fishery, fertile wetland, and trade route. In the beginning this area had a lot of potentials for settlement's life. People settled in the area because of its economic potential, social bond among the communities, and place attachment. This can still be found in some settlements, mainly those who have been living in the riverbank settlements for generations (Liao, Le, and Nguyen, 2016).

People residing in urban riverbank settlements experiencing socio cultural and environmental pressure due to technological change in development and the direction of urban development. This change has altered the character of the riverbank area. The contemporary trends have conducted the city to gradually losing its image. Modernization of the city has shifted the community's activities, source of livelihood and living culture. The community is more interested in living at an environment that is more easily managed. The riverbanks

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adaptive living culture has turned into controlling over the environment. Houses in dry land are more economically valuable. The community responded to this trend by reclaiming the riverbank wetland and building houses with permanent rigid construction and structure. The conflicts with the sustainable ecological paradigm have caused the urban communities to have the possibilities of losing the riverbank character and tourism potential. The uniqueness of the riverbank settlement environment is potential for the development of tourism in the City of Palembang. This area is reflecting the image of Palembang as a riverbank city. The authentic architectural style of settlements along the Musi riverbank has made this area to be unique and important to be preserved as cultural heritage for tourism planning involving the community in preserving the character of the riverbank settlement (Lussetyowati, 2015).

The conservation of the area unique character is not only preserving the quality of the physical environment. Preservation of the settlement area uniqueness depends on the sustainability of the interaction between the socio-cultural community and the river ecosystem. In the life of riverbank community, the riverbank landscape and the community daily lives are factors that influence each other in forming the character of riverbank settlement. In fact, in the previous community, their daily cultural lives closely interacted with the river. The residents constructed their houses with technology and material adapted to the fluctuating situation of the riverbank ecosystem. The settlement's pattern is adjusted with and depends on natural conditions. The communities reconcile with and take advantage of the natural cycle patterns of the tidal conditions and even flooding. Traditional societies have a method of managing riverbanks settlements which are a blend of pragmatism, urbanism, and symbolism (Oktarini, 2019a). Building technology works by mimicking natural cycle system. Innovative hydrological engineering as well as an understanding of topographical and seasonal weather patterns have major implications on the morphology, evolution, and vitality of the settlements. Residents' dependency on the interaction with the riverbank ecosystem while conducting their daily activities has created an attachment and connectedness among the residents with the sustainability of the river ecosystem. The use of natural resources for the needs of life and activities in settlements has maintained the balance of the area ecosystem (Chang *et al.,* 2011).

The architecture of the settlement buildings was formed as the result of human adaptation with the ecosystem by developing the character of local physical environment (Altomonte, Rutherford, and Wilson, 2015). Architecture is a physical product of an adaptation process of

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the existence of the distinctive riverbank community socio culture. At the riverbank settlement, the characteristic of architecture is the product of an interaction among the residents in fulfilling their daily needs by utilizing resources from the river ecosystem. The riverbank settlement environment was formed as the result of the role of the river as an infrastructure, i.e. transportation, drinking water, open space, and even part of the community sanitation infrastructure (Elysia and Wihadanto, 2020).

Cultural preservation is closely related to the existence of physical building creating riverbank environmental character as a potential local identity and culture. Settlement planning by preserving the character of the riverbank area has a characteristic in which the buildings are oriented toward the river. The river becomes a positive open space, viewing space, air, and sun. Riverbank settlement utilizes the active riverbank as riverbank public open space that is interactive, accessible, and useful for the city residents. At a riverbank city, the riverbank is an open space for recreational, cultural, and scientific activities (Nimsamer and Walliman, 2013).

The landscape characteristic of the riverbank was formed from the natural topography of the inundated land of the riverbank. The contour of the riverbank in the study area is very flat so that the border between the river flow and its bank is vague. It is inundated with the river overflow in a wide area functioning as water storage, deposition, and absorption. Land in the riverbank has another characteristic from the natural vegetation (native species) forming a form of adaptation with the humid ecosystem and the inundation of tidal water (Shannon, 2013). Development at the riverbank landscape is preserving the landscape characteristic that has become a unity between the buildings and their environment as character builder of the riverbank area.

Tourism planning based on settlement area conservation is preserving the physical environment based on a harmonious social and culture of the settled community. The paradigm is that it is not only natural environment protection, but also the protection of the physical characteristics of the cultural products of the community adaptation to local ecosystem conditions (McInnes, 2010). Furthermore, the issue relates to cultural, ecosystem and biological balance within certain local contexts. Cultural as sosial capital plays an important role in arrangement urban settlements. The improvement of built environment arises from public knowledge about the quality of the environment in their settlements. It grows along with the increase in knowledge and environmental awareness of the residents (Ranreng, Wiranegara,

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and Supriatna 2017). The development approach emphasizes the harmony of the development with the natural working systems of the ecosystem (Su, Fath, and Yang, 2010). Physical environment formed naturally was the product of an interrelation between ecology, culture and behavior to understand the life between structures to create an urban planning (Mateo-Babiano, 2012).

The study studies the housing preferences of the residents in the riverbank settlement. It investigates the preference of the occupied house and the house preferences. The comparison is expected to reveal the shift in house preference. The objective of the study is to figure out the potential of the sustainability of the riverbank settlement as a tourism object.

2. RESEARCH METHODOLOGY

The respondents are resident of settlements along the riverbank in Palembang. The locations of the six settlements are on both sides of the river in a similar distance between the locations. The sampling areas were in the wetlands where some settlements were always inundated by the river overflow. In some settlements, the houses were built close to the river stream. Each of these settlements has different levels of building and environmental quality. Most of them are dense and organically developed settlements. The highest density residential areas are in locations 3, 4, 5 with a ratio of land cover by buildings of more than 60%. The sixth location has a density around 50% land cover by buildings, while the first location that in the border with a rural area is a newly developed area that has a lower land cover density. The access can only be traversed by motorbikes. In most areas, cars cannot pass to the edge of riverbanks, therefore along the riverbank there are a patch up docks to lean the boat. The boat becomes a prime transportation connecting locations along the riverbank and crossing to the other side of the river (Figure 1).

This research focuses on the physical form of residential buildings from the perspective of socio-cultural preservation. The socio-cultural viewpoint preserves building architecture as an object derived from the process of community adaptation to the ecosystem situation of the riverbank environment creating a living culture for a long time (Pratt and Chang, 2012). The architecture of the building in the riverbank is the main physical form of riverbank settlements. The identification of the collected data of house preferences through building attributes shows that what impresses the changes in the riverbank's character settlements are the type of house

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building, foundation, and material (Singelenberg, 2008).

Figure 1 Map of the six riverbank settlements where data was collected (left) and ilustration of the settlements in Musi riverbank (right)

The study collected data on the house choice and preferences. House choice is the house that is occupied, whereas house preference is a house someone's wish to own. House preference shows the original attraction of someone on a certain house without taking into consideration the obstacle to obtaining the house such as ownership status, purchase capability, etc. The preference is a person's attraction to relatively unlimited house objects. Preferences reveal attraction on object guiding someone in making the choice. The choice is a preference that has been evaluated with other considerations. The preference can be a choice or a cancelation because of other considerations. The considerations affecting choices are a combination of financial conditions, regulations, considerations, and other personal factors such as lifestyle and social status. The house preferences is often different from the choices and it does not indicate a strong relationship with the chosen home in many cases (Jansen, Coolen, and Goetgelu, 2011).

The survey recorded respondent's data of the occupied house by observing and asking for preference data through questionnaires. Observations include photographs, sketches, and measurements. Respondents are homeowners with a house distance of no more than 100 m

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from riverbanks and is inundated by periodic river overflow. The number of respondents was around 80-100 for each location.

The rate preference levels are for three types of house building, two types of which are common houses in the settlements and the other one is an unfamiliar type. The three building house types are detached, terraced, and flat house. The detached and terraced houses are common types in the riverbank's settlements with one to three floors. Most of the detached houses are vernacular type provided space between buildings. It provides a direct view of the river. Residents modify the detached house into a terraced house according to land limitations and the increase of the density in the settlements. The flats accommodate house unit vertically to accommodate more open space. It is good for the conservation of the nature but degrades the character of the vernacular architecture of the riverbank houses. It also alienates the interaction between residents and the river.

There are three types of house foundations, i.e. floating, pillars, and landed. The movement of houses with a floating foundation is adjusted to tides and waves. It authenticates the architecture of riverbank houses. Most houses are built on pillars to raise the building above the water level. The typical vernacular houses on Musi riverbanks were built on the pillar foundations. The third foundation is the landed foundation. Houses with landed foundation stand on reclaimed land, surrounded by boundary retaining walls. The reclamation transforms the ecosystem of the wetland on riverbanks into dry land.

Building materials that can easily be assembled and disassembled are more appropriate with the tide and increasing water height and they are easily adjusted with the water height. The use of local wood found in the tide land provides strength to the building without significantly changes the ecosystem condition of the inundated land. The construction is also faster and uses only simple tools. In addition, bricks and concretes are often used to build houses because they are easily found, more durable, and with minimal maintenance. This can be compared with the Kampung around Code River, Yogyakarta which used organic materials (wood, bamboo, local roof tile) for the construction of their houses (Idham, 2018) .

This research categorized the respondents into several clusters based on their preferences. As a result, the preference analytical method can be modified with cluster analytical method. The method used is cluster analysis with hierarchical method. Cluster analysis is then followed by correspondent analysis to reveal the significance of the relationship or proximity of a

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category with another category. The result of the analysis will be more significant if the preference among respondents within the same cluster is very homogenous and the preference among different respondent groups is very heterogeneous (Greenacre, 2007).

To analyze the data of house's choice, distribution analysis is used to see the percentage of choice attribute based on factual data of the resident's choice. The preference data is processed using distribution analysis based on likeness level with a scale of 1 to 5. The preference value is measured on a scale of 1 to 5. Point 1 shows the lowest level of likeness and point 5 is the highest. Point 1 shows that the residents are not very fond of the choice, and vice versa. Medium or neutral point for this choice is 2.5.

3. RESULTS AND DISCUSSION

The majority of the types of houses occupied by the residents still have riverbank building character. The type is single house with stage foundation using wood material and can easily be found in the settlements along the Musi riverbank (Oktarini, 2019b). Single house is a house with walls separated from and has a distance of more than 50 cm with the nearest house. Most residents reside in this type of house. Another type of house is attached house, i.e. two or more of the house sides are attached to the neighbor's house. It usually has one or two floors. Some of the attached houses are single house divided into several attached houses. The partition was due to the division of inheritance to some beneficiaries or parts of the house is rented to some households. Flats house-like house is not found in the settlement along the Musi riverbank.

Most residential buildings were built on pillar foundation. The height of the house floor on pillar foundation can be adjusted to avoid river overflow. Most pillar foundation uses wood that is resistant to water tide that causes wet and dry condition on the foundation pillar. This wood can sustain for decades without any damage. Building erected on the pillar foundation is stable without any significant disruption from the water flow movement usually occurs in a floating house. A house with a floating foundation is rarely found along the riverbank in the city of Palembang because floating foundation causes the house to sway in accordance with the water movement. The house is moored to a certain location at the river body. Another house building is erected on the site foundation on landfill site. Land was filled with soil to form a dry land for daily activities of the residents.

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Most houses in this settlement, have stood and been built for hundreds of years, use material structure and wood construction. At the time the houses were constructed, wood was the building material that was available abundantly from areas surrounding the city of Palembang. Wood was abundant material and easy to assemble and disassemble to be moved to other location or be readjusted with the height of the river water surface. The wood was transported by floating it through the river stream. House construction on the riverbank directly connected with river stream benefited from this system of wood transportation. Nowadays, brick has been widely used by the residents since wood material has been difficult to find and brick and concrete material have made the house to be sturdier with less maintenance.

The average preference of all respondents in all location shows that the residents consider the type of foundation attribute as the most important attribute. The weight is 44.7% which is slightly different from the respondents concern with the house type which is 40.4%, whereas the type of material only received 14.9% respondent's attention. Even though there is a strong correlation between the occupied house with the house preference, the residents have different preference with the current existing houses. The most preferable house is single house with site foundation and brick-walled material.

Most residents occupy single houses and the rest occupy row houses. As for the house preference, the residents prefer single house and tend to be neutral for row houses. This shows that for settlement planning, the residents prefer to build single house than row house. No resident prefers to live in flats house let alone replaces their current houses with flats house. The point of flats house preference has a significant gap with the preference of single house. The gap shows the huge concern of the residents on the building type attribute of their houses.

Residents prefer houses with stable foundation with no affect from the river flow movement. In terms of foundation, site foundation is the most preferred since it gives a stable house and controllable environment. Furthermore, pillar foundation is more preferable than floating foundation for the same reason. The rating of floating foundation is the smallest among other choices of building attribute.

For type of material attribute, both choices of material type are preferred by the residents. The gap between the points that are not too large and is still above the neutral value shows that residents prefer wood house similar to the material of their current houses. However, brick-walled house is more preferred than wood house.

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Table 1 The choice of occupied house and preference of house

Attribute	Attribute Levels	Percentage of occupied house attribute	Rating of the house attribute preference
Type of building	Single House	53 %	3.33
	Row house	47 %	2.52
	Flats house	0	1.56
Type of foundation	Floating	0	1.33
	Pillar	64.5 %	2.92
	Landed	35.5 %	3.29
Type of material	Wood	70 %	2.73
	Brick and Concrete	30 %	3.38

Table 1 shows that from the three attributes of the occupied house, only type of building is the most suitable with the residents' preferences. The result of the comparison between the occupied house condition and the house preference shows that type of foundation and material are house attributes that are less suitable with the preference of the majority of the residents. The residents wanted to replace the pillar foundation with landed with site foundation and also the main material of the wood house with brick wall and concrete structure. This preference to replace the house attribute shows a transformation from a settlement culture adaptive to wetland ecosystem fluctuation to settlement culture in a controlled environment.

The result of the analysis above reveals average picture of the residents' data in general. Cluster analysis can be used to reveal groups of residents based on preference similarity. The grouping will give a more detail picture of preference data for each group. Analysis with Hierarchical option cluster delivers points into row of clusters with points relatively close to one another in a cluster and separates different line values into another cluster. The clustering hierarchical process began with positioning of each point according to its value in its respective cluster. In every step, the two closest groups are merged into one cluster. This process continues until there is only one cluster containing all similar points.

Dendogram diagram is a tree diagram containing the list of the preference of each respondent. The diagram in Figure 2 shows the position of each respondent in each cluster according to the rank of their preference similarity. Each member is grouped into a cluster which has a similar preference compared to the preference of the member of other cluster. The

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result of the analysis on the grouping of respondents can be divided into five clusters with balanced number of cluster member. Cluster 2 becomes the cluster with the most member, whereas cluster one has the least number of member. Two other clusters have balanced number of member (105 and 106 members) and one cluster with 122 members.

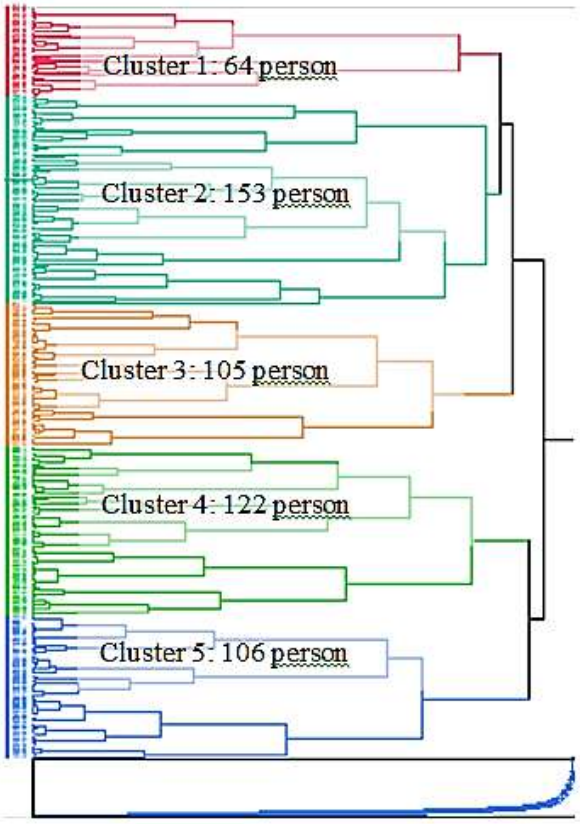

Figure 2 Denogram diagram of cluster analysis based on preferred house preference

The position of the cluster branch at the tree trunk of dendogram diagram shows the position of preferences similarity. The diagram above shows that the position of cluster 1 that is close to cluster 2 shows similar preference between the two compared to the preference of other cluster. The next tree branch of the dendogram diagram shows the two clusters have similarity in preference with cluster 3, whereas cluster 4 and 5 have preferences that are more similar one with another compared to the preferences of the previous three clusters.

Correspondence analysis (Figure 3) is a graphical technique to show rows or columns of the frequency table with similar calculation pattern. The variable used is always nominal, either

numerical or character/text. Correspondent analysis produces correspondence analysis plot (cap) with an axis with a score showing the closeness of the inter category correlation. The point of variable with similar variable profile will be close to each other. The square distance between the point of variable is more or less comparable with the distance of the Chi-square testing the homogeneity between a pair of row. The proximity to correspondent analysis shows the possibility of inter category co-incidence or co-occurrence of the nominal variable. Each axis has cumulative inertia portion showing the indicator of the capability portion of the axis to explain the data.

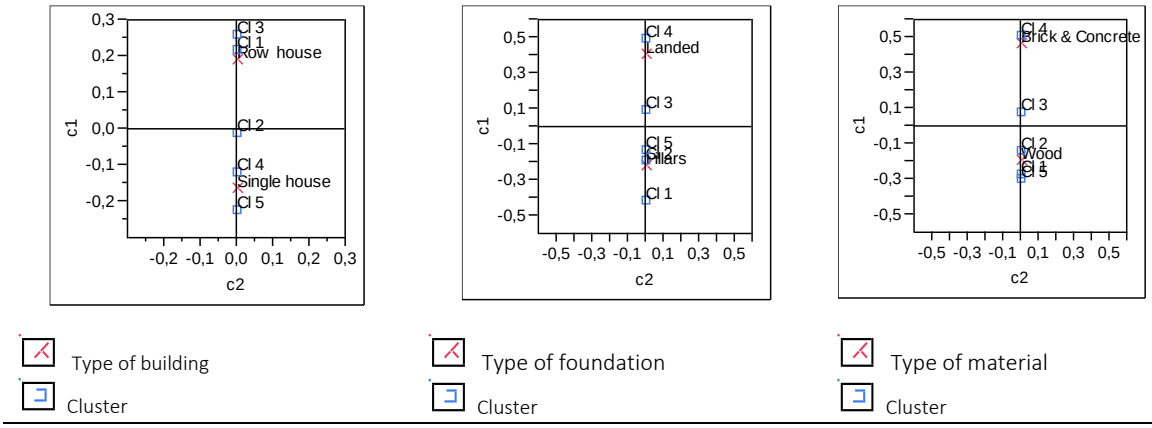

Figure 3 The result of correspondence analysis on the correlation between cluster and preference for each attribute

There is a connection between the attribute of the current occupied house with the cluster category based on house preference of the residents. The result of analysis on house type and foundation type with cluster category shows the capability to explaining 100% of the data propensity, whereas the result material data analysis is capable of showing 99% of the data propensity. Therefore, the attribute type of the house currently occupied by the residents have a correlation with the house preference of each cluster.

The percentage of building type attribute of the house occupied by the residents is comparable between row house and single house. A quite big difference in percentage only occur in cluster 5 which occupy more single house than the row house. As for the choice of type of foundation, the residents use more of stage house foundation than landed foundation (Table 2). The difference is quite big for cluster 1, 2, and 3. Only cluster 4 has a higher percentage of

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occupied house using landed foundation compared to pillar foundation. Whereas for the type of material attribute, wood is used more than brick and concrete.

Table 2 The choice of occupied house attribute in each cluster

Attribute	Attribute choice	Cluster 1 (%)	Cluster 2 (%)	Cluster 3 (%)	Cluster 4 (%)	Cluster 5 (%)	Total (%)
Type of Building	Single House	42.2	53.6	40	59	64.15	53%
	Row house	57.8	46.4	60	41	35.85	47%
	Flats house	0	0	0	0	0	0
Type of Foundation	Floating	0	0	0	0	0	0
	Pillar	84.61	74.03	60.38	40.8	70.75	64.5%
	Landed	15.39	25.97	39.62	59.2	29.25	35.5%
Type of material	Wood	83.08	76.62	66.04	53.6	83.81	70%
	Brick And Concrete	16.92	23.38	33.96	46.4	16.19	30%

Important attribute weight shows the magnitude of attribute influence calculated from the difference between the highest attribute point and the lowest attribute point. The percentage number shows the influence of the attribute if it is compared with the influence of the entiry attribute (Winterfeldt and Edwards, 1986). The type of foundation attribute becomes an important attribute in the consideration of chosing a house for all clusters, although for cluster 2 and cluster 4 the type of building attribute is the most important attribute. In an indundated land the type of building foundation is very influential for the comfort of living in the area (Table 3).

Table 3 The weight of attention on house attribute in each cluster

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Type of Building	25.70%	45.50%	25.10%	53.60%	33.70%
Type of Foundation	48.10%	43.90%	46.60%	44.70%	41.50%
Type of material	26.20%	10.60%	28.30%	1.70%	24.80%

Almost all residents' cluster occupies type of building in accordance with the preference, except cluster 1. Currently, cluster 1 occupies row house and has the desire to replace the houses with single house, a type of house that has been most preferred in almost all clusters. Only cluster 3 prefer row house more than single house. Most residents of cluster 3 occupies

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row houses and do not want to replace their houses with single house, however; cluster 3 quite satisfies with single house type.

Cluster 1 and cluster 2 preferred most houses with pillars foundation that corresponds to the foundation of their current houses. Cluster 3 and cluster 5 also occupy houses built on pillar foundation which provides a building level safe from river water overflow and tide flood. Different from the residents' preferences in cluster 1 and cluster 2, the propensity of the residents in clusters 3 and 5 are willing to replace the pillar foundation by erecting houses with site foundation on dry land. Cluster 4 has different preference. The currently occupied houses with site foundation correspond to their preferences. This result of analysis shows that most residents tend to prefer landed house which provides land for the mobility of the residents to access their house yard.

Most houses occupied by the residents use material structure and wood construction. Almost all clusters prefer to replace wood material with stone and concrete. Only cluster 1 who still prefer to use wood material and not replacing it with stone material. Whereas, cluster 2 and 4 prefer brick house, but they still prefer wood material. In fact, the difference point is very small in cluster 4 which can be concluded that residents in cluster 4 do not consider type of material in deciding their choice of house.

Table 4 explained the preference for occupied and preferred house show differences for each residents' cluster. There is a cluster level based on house preference. The residents of cluster 1 prefer only to change the building type attribute. Currently type of foundation and house material attributes have been in accordance with the propensity of the preferences. Whereas the most preferred house in cluster 2 is a combination between single house and stage foundation and brick material. Most houses occupied by the cluster residents have been in accordance with the combination. The residents in cluster 2 prefer to replace the material structure type and the house construction from wood material to stone. The change only influences 10.60% of the consideration on the total preferences and becomes the smallest percentage of consideration in the decision on house preference.

Cluster 3 is very fond of row houses with landed foundation and main material of brick and concrete. The residents of cluster 3 have the desire to change the house foundation and material. The wish has given the most important influence in the preference. However, cluster 3 still prefer houses with riverbank type of house, i.e. single house with pillar foundation and

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wood material. The preference of cluster 3 shows a shift of preference that is oriented more on the landed house character than the preferences of the previous clusters.

The most preferred house attribute of cluster 4 and 5 is single house with landed foundation and main material of brick and concrete. Similar to the analysis on cluster 3 preference, the preferences of cluster 4 and 5 show preference of landed house character. The type of single house occupied by the two clusters is in accordance with the preference of house they prefer. However, the result of the preference shows that cluster 4 still prefers the combination of house attribute with riverbank house character, i.e. the type of building using pillar foundation and wood material.

Table 4 The choice of preferred house attribute in each cluster

Attribute	Attribute levels	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Type of building	Single house	2.62	3.6	2.5	3.84	3.68
	Row house	2.55	2.42	2.84	2.71	2.2
	Flats house	1.58	2.23	1.8	1	1
Type of foundation	Floating	1.17	1.82	1.6	1.33	0.53
	Pillar	3.12	3.14	2.78	3.48	2.17
	Landed	2.58	2.71	3.53	3.7	3.83
Type of material	Wood	3.15	2.93	2.43	3.6	1.8
	Brick and concrete	2.09	3.25	3.6	3.69	3.77

This preference is different from cluster 5 who do not like houses with pillar foundation and wood material. The result of their preference shows that residents in cluster 5 really want to change the foundation and house material attributes of their occupied houses. The residents of cluster 5 also want to change pillar foundation into landed foundation and wood material into brick material. The weight of attention of the two attributes very much influences the preference of cluster 5.

The preference of each cluster shows a gradation of changes in preference based on the comparison of the choice between occupied house and preferred house. Cluster 1 is a cluster with preference that is mostly in accordance with the character of riverbank house typology. The transition of a preference of preferring a house with the character of landed house began at the preference of cluster 2. Cluster 2 craves for a change from detachable material flexible to

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river water puddle to concrete and brick material that is minimal to change the formation. A preference that prefers the character of landed house is strongly shown at the preference of the residents in cluster 3, cluster 4, and cluster 5. The three clusters do not only want to have houses with permanent material, but also to replace the house foundation. In addition, they also want landed foundation separating their yard from the puddle. Even at the cluster 5, the preference on replacing the foundation and the material is very influential in their decision.

Development planning for riverbank settlement needs a strategy of land use management with an approach of balancing the needs of residents' community by maintaining the character of the house that is in accordance with its ecosystem. Tourism should be developed from the area character formed by the community culture following the development of urbanization. Therefore, area planning is developed from the forms of innovative development with economic value while at the same time maintaining the unique character of the area. Therefore, conservation does not focus only on the physical product of architecture but also the synergy between the built environment, socio-cultural, and in an interactive ecosystem forming the area character.

Trend of development in most riverbank area in Indonesian cities does not take into consideration the preservation of the character of riverbank community landscape and socio cultural character. Dry-land-oriented urban development is developing a construction technique and infrastructure to be built in the ecosystem. The change in the orientation of settlement pattern to land centrist has changed the urban infrastructure system facilitated by the changes in the settlement pattern. The direction of the change is not in harmony with the sustainability of the service performance of wetland riverbank ecosystem. The trend also influences the preference of riverbank residents. The preference of the residents shifted to settlement with landed house character. Changes in conducting daily activities have changed the preference to live easily in the settlement. The slow change will eliminate the character of the riverbank area.

Single house is still the main choice of most of the residents. On the contrary, the residents have no desire to live in flats house. The choice is in line with the character of riverbank settlement which is opening up the view to the river. The single house with a distance between the houses has opened up empty space for a free view to the river. On the other side, single house needs a wider building base. Therefore, development planning should maintain the

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building density. Area planning balances the combination between height and the building base area by taking into consideration the viewing space.

The shift of resident choice and preference from riverbank character house type becomes the character of landed house. Most residents want to change the foundation type along with the material structure and house construction. Residents are not interested in flexible foundation adjusting to the contour letting the water flows through the house foundation legs with a level in accordance with the river tide. The residents prefer houses with dry yard formed by the landfill. The local reclamation replaces the landscape of the riverbank to land by constructing a clear border between land and water. A limitation also gives a distance for daily activities of the residents which has a direct interaction with the river. The criteria of the foundation that is in line with the riverbank land use as flood control is the type that does not block the water flow, such as floating foundation. On the contrary, residents do not want houses with floating foundation. Pillar foundation can become a type of foundation that is still fulfilling the wish of the residents and only produce a little obstacle at the water flow.

The shift in house choice and preference is also indicated in material choice. Building materials that are permanent, stiff, impermeable, and minimal maintenance are more preferable even though without flexibility to assemble and disassemble the materials to move the house and increase the level of building floor. The fluctuated character of riverbank ecosystem requires building that is pliable to changes. In addition, wood material formed into grid shape can transfer fresh air that will get rid of the humidity to create a thermal comfort inside the room. The use of wood material does work in the local natural ecosystem. Changes in preferences show the need for innovation in the development of new material. Planning is not only taking side with the residents, but also balancing the needs of both sides. The residents want conveniency and practicality and architectural renewal that are adaptive to specific ecosystem.

4. CONCLUSION

The result of analysis on house preference by the residents shows the potential of restoring the character of the riverbank area. Even though it is not the most preferable combination of house attribute, riverbank house character remains the most preferable alternative choice. Therefore, designing can develop innovation in formation, technique, and the use of new material in

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meeting the expectation of the residents that correspond to the development in technology, social and community culture by preserving the unique character of the ecosystem forming the uniqueness of the architecture. The tourism activity displays the result of community cultural symbiosis transformation into its natural landscape that continuously experiencing changes in various factors along with time, not a rigid conservation that discontinue the changes in order to meet the need of tourism market. Planning with preservation includes a mechanism that not only guarding the existing natural establishment, but also the capacity to adapt to always evolve. Preservation for tourism activity not only displaying the formation without any changes but the pliability to adapt to continuously search for new forms from the symbiosis between man and nature.

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