EVOLVING CONNNECTIVITY PATTERNS OF BANJARESE KAMPUNGS AND RUMAH BUBUNGAN TINGGI (HIGH RIDGE-HOUSE) IN SOUTH KALIMANTAN RIVER NETWORKS

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ABSTRACT
The objective of this study is to clarify the connectivity: spatial and physical patterns of Banjarese Kampung in South Kalimantan river networks for the community of Rumah Bubungan Tinggi (RBT) or high ridge houses. It provides a basis for potential reconstructing a Banjarese Kampung in keeping with the sociocultural context. We investigated a total of an urban kampung (177 households) and 12 RBT groups (4 RBTs groups in 1 urban kampung and 8 RBT groups in 2 rural kampungs). We describe the development of kampung throughout the evolution of river networks, then analyze the formation of dwelling in the urban kampung and the changing of spatial composition in the kin-group. The discussion on the evolution river network is based on the reconstruction of waterway patterns from the 15th until the mid 20th century. Finally, the kinship interaction reveals the open-ended multifamily boundaries and the changing level of house connectivity such as rival kin-group.

Keywords: Rumah Bubungan Tinggi (RBT) groups, kampung, connectivity, spatial composition, South Kalimantan

INTRODUCTION
Learning from the past is the crucial point of cultural value, as recognized by authors such as Rapport (1988) and Puspitasari, at.al (2018) who regards spontaneous settlements as a combinations of expressiveness, identity, architectural and environmental characteristics. These aspects are all present in popular settlements; e.g. Rumah Bubungan Tinggi (RBT) in Banjarese Kampung, South Kalimantan, Indonesia.

In spite of economic limitations, these conditions have dynamism and vitality often lacking in the contemporary urban environment of the majority group of Kalimantan. Banjarese Kampung (Chalmers. Ian, 2006) is the Malay urban settlements that developed in the center of kampung Ngaju Dayaks in Kalimantan area at the beginning of the 16th century. In South Kalimantan, kampung originated as cosmopolitan urban settlements for maritime traders and craft specialist surrounding the palaces of the kings that developed within the culture plurality among Malays, Banjarese, Chinese, Buginese, Makassarese, Javanese, and Dayaks, though the term now refers to an urban and rural district.

South Kalimantan Province has over three million people in an area of 37,669 km² and 10,000 km² of wetlands. Banjarese has about 80% ethnic group in South Kalimantan. The RBT is the most important traditional type of Banjarese house in South Kalimantan. A large number of clans live in the area but the majority of indigenous people are either Banjarese, Dayaks, or both lay claims to being the original inhabitants of the land. Ritual, cultural, economic and environmental issues resulted in a specific urban form, from the beginning of seven kampungs that existed in this area (Figure. 1A). The cultural matrix that has developed over the past century and the present population is an amalgam among tribes (Departemen Pendidikan dan Kebudayaan., 1978).

We focus on the connectivity (physical and spatial) of a group of RBTs and its changing spatial role in the evolution of
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river networks. Since remained waterway networks will conserve in importance for South Kalimantan Province.

We examine the traditional concepts that were used in the development of kampungs throughout the evolution of river networks. We show that the high degree kinship interaction reveals the open-ended multifamily boundaries and the changing level of house connectivity such as rival kin-groups.

Finally, the results of the analysis the “rules” of the groups vary among kampungs due to the impact of modernization. This study encourages the formation of kampungs to establish a good neighborhood, a peaceful environment and the desire for traditional cultural heritage as a priority. Earlier studies of these kampungs concentrated on the general architectural characteristics and the Banjarese culture in South Kalimantan. Daud (1997) attempted to analyze the Banjarese culture concerning the structure of clans and the organization of the Muslim society in South Kalimantan. Mahin (2005) described the Banjarese identity and its ethnicity in South Kalimantan and tried to re-trace Banjarese as a distinct ideology by re-reading the Hikayat Bandjar by Ras.J.J (1968) and Saleh (1986) described the construction of a Banjarese culture from the historical point of view. Based on those architectural studies, we describe the evolving connectivity patterns of a Banjarese Kampung and how it has developed from the beginning of RBTs. To our knowledge, there has been no report concerning the RBT groups especially its connectivity and organizing principles in the river networks.

![Figure 1. Observation area and historical development of Banjarese kampung in South Kalimantan](Source: Pemko Banjarmasin, 2017 and KIT, Amsterdam, 2008)
RESEARCH FRAMEWORKS

a. Context

Figure 1 shows the location of the study area in South Kalimantan Province, which is divided into 9 regencies/kabupaten (The Japan Association of Economic Geographers, 1994), 109 districts (kecamatan), and 2169 small administrative units, the urban villages/village-kampung/desa (kelurahan). The municipality of Banjarmasin is the capital of South Kalimantan Province and the seat of ancient Banjarese Kingdom (1520-1620). The river network in South Kalimantan reflects the characteristics of the varieties of urban structure and the act of dwellings. The historical maps were obtained from Dutch Colonial Historical Maps, Royal Tropical Institute (KITLV, n.d.Koninklijk Instituut Voor de Tropen-KIT), The Netherland.

Figure 2. Building composition in Kuin Utara
(Source: Field Survey, 2018)

Figure 3. RBT kin-group in Kuin Utara
(Source: Field Survey, 2017-2018)
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b. Objective and Methodology

The objective of this study was to clarify the connectivity patterns of Banjarese Kampungs and RBT – high ridge-house in South Kalimantan river networks that provide a basis for reconstructing a traditional kampung in keeping with the cultural context. Therefore, the common model of RBT, the structure of kampung, kinship grouping, the changing pattern of RBT groups and river networks have been investigated within the following progress:

1) Scope

The purpose of the survey was to provide information about the variety of RBTs and the relationship with other dwellings in South Kalimantan. The survey form was divided into two components: a physical survey and a social survey or household interview. The physical survey was a detailed technical survey that included inspection of both the exterior of the house and river network paradigm. The social survey consisted of a short interview with the householder concerning a range of topics, such as house background, home improvements, kin-group or relationship among neighborhoods, and monthly income. We cross-referenced the information gathered by the social and physical surveys.

2) Fieldwork

In order to review the architectural and tribal treaties that were identified in part 1 for a large number of RBTs the fieldwork was directed toward recording dwellings as a physical and as a social component in each group of dwellings. The number of dwellings, the number of inhabitants, and the movement of inhabitants between dwellings as selected from the benefits records, were recorded manually. Next, an investigation in August-September 2017 into the Banjarese Kampung Kuin Utara, which is regarded as midway between poor dwellings and royal relatives’ palace. The observation area, which included the Banjarese Kingdom complex of Sultan Suriansyah Mosque and the Royal family’s grave, contained 177 households in 49 extended family groups of dwellings.

We visited three other Banjarese Kampungs in March-April 2018 to record the pattern of RBT groups5 that are Surgi Mufli and Sungai Jingah in Banjarmasin; and the most ideal RBTs in Teluk Selong, Melayu Kampung in Martapura. This addition was made to reflect the trend of changing from multi-family dwelling to single-family dwellings. The measurement was done by using the site plans and elevation CAD programme. The differences among RBTs, the building

![Figure 4. Sector Statistics](image-url)
groups, and neighborhoods can be seen more clearly. To explore the interplay between waterway evolution, tidal landscape, and connectivity patterns, and high ridge house models are modified based on river network configuration changes.

Interviews with and comments from several heads of *kampungs* such as RT (Rukun Tetangga “neighborhood cluster”) and other *kampung* elder who know the background of *kampungs* very well were recorded. Finally, morphological river networks were verified, whether quantitative or qualitative, highlighting strengths and weaknesses as a framework for evaluating urban structure property for conservation area.

c. **Prototype of Rumah Bubungan Tinggi (RBT) in South Kalimantan**

![River Network Maps](image)

**Figure 5. The morphological of river network from the beginning of 19th century 1901 scale unknown, 1943 found the lost river and new river.**
(Source: Topographic Map of Banjarmasin, Colonial Historical Map, Royal Tropical Institute)

### Historical Background

The population of South Kalimantan is increasing rapidly and the demand for housing is outstripping the supply. This is a pressing issue that requires a detailed understanding of the role of mixed-use *kampung* and the implementation of new approaches that can assist in the traditional designing of the infrastructure and provide good quality housing. From a humble beginning, during the change from an agricultural community to a maritime city, the development of RBTs in 1530 was affected by several aspects of the underlying structure of society, such as the existence of a palace, the adoption of a water habitat, and the development of communal values. The result was the change of a small area of Banjarese Kampung2 (Figure 1B), that is now namely Kuin Utara -North Kuin with...
parallel state-wide growth under colonial intervention during 1843–1859 (Figure 1C). Since 1990s, local government in South Kalimantan has decreed that all government building should be in the form of an RBT. Most RBT have undergone some kind of changes, they still show traces of similar principles according to the transformation of built-up environment in each generation (Table 1).

d. Analysis

1) Case study: the Banjarese Kampung “Kuin Utara”

The fieldwork was done in Kuin Utara (Figure 2), an oldest Banjarese Kampung in the district of Banjarmasin. One main street and two main rivers cross at a right-angle and divide the Kampung into a distinct but random distribution of dwelling compounds. The objective of the survey was to understand the formation of the overall physical patterns of dwellings that maintain the integrity of an RBT and to search for the generation of social interaction. The survey aimed to figure out formation of physical patterns to the overall dwellings of the integrity of RBT and prompts a search for generating social interaction between outsider “global Banjar” and “other tribes” and insider “local Banjar” group of dwelling.

Administratively it is part of Kelurahan Kuin Utara (74 km²), one of the sub-districts of North Banjarmasin. Kuin Utara is derived from the Banjarese words utara “North”, and kampung keraton ‘palace village’, and kuwin ‘queen’ is the Dutch name for the Kuin river, which is located at the mouth of the vast Barito River. The Sultan Suriansyah mosque and royal family graves that were part of Banjarese palace complex of buildings, floating markets, small mosques, and RBT fill the corners of the intersection. It has been the heart of the Banjarese society for hundreds of years, because the Dutch took control of the island in 1612 and Kuin was more popular than the palace in the Banjarese Muslim society. The land is flat and situated within the 11 RTs.

Physically, the buildings consist of small mosques, rented houses and several private house types such as duplex, row house (terrace house), courtyard house, and RBT.

Figure 2 shows that the majority of 177 households and 750 residents were local Banjarese (87.84%), global Banjarese (10.81%) and of Javanese descendent (1.35%), thus it seems justifiable to conclude that the kampung, in large part, is culturally homogeneous. Primary employment activities showed that Kuin was a trade kampung with 20.14% of its population working as small traders and 20.18% as laborers’, whereas the other employment activities were civil servants 12.33%, merchant/retailer 8.22%, and woodcraft, handicraft and other art producers 5.06%.

The pattern of settlement in figure 3, 49 extended families groups of dwellings form 29 RBT groups, whose members made up about 80% of all buildings seems to be the potential alternative as affordable housing group due to the dismantling and replacement of the old RBTs; however, necessarily related to RBTs. There is a significant number (28 out of 49, 32.65%) of local RBT groups that have been transformed into duplex and row houses. There are global group of dwellings between the RBT groups (23 out of 49, 46.94%), which occur between RBTs whose inhabitants are from different kin-groups and could refer to themselves as extended families.

In addition, the residential buildings in this area include RBT and Traditional Banjar: 4.21% pile and raft house, 22.43% duplex, 72.89% row house, and 0.47% courtyard (Figure 2). Kampung of this type tend to have a central business district, and are characterized by high rates of migration. However, they also exhibit an internal region of disparity, as manufacturing and related activities have been moved out of city canters, leaving decaying neighborhoods where 12.43% of the population are elderly and marginalized people.
2. Exploring RBT and River Network

2.1. Structure of Ordinary by different RBT groups

In the past, each *kampung* was managed by a tribal council that was responsible for the society needs and urban development. The change in the administrative system transformed the RBT in the *kampung* of Kuin Utara and destroyed the old physical structure. The structure of *kampung* may be defined by various linkages between elements within its urban activity. This section attempts to give an understanding of environment concept that were mostly work out and developed for a group of dwellings based on the combination of building groups, entitled “block type” and the characteristics of each combination “sector type”. The survey was done by visiting the *kampung* of Kuin Utara in Banjarmasin and measuring both block and sector types which has certain urban fabric that would be mean in term of environment qualities and quantities. In fact, the traditional form has undergone 80% radical transformations in which a great part of its coherent and relatively homogeneous traditional urban structure has been lost.

However, the two significant historical buildings, the royal graves and the Sultan Mosque that being conserved by local government remain as isolated entities deprived of their symbolic meaning and urban context. Figure 4 shows the three commonest block types, which are outlined to provide a convenient reference in each sector type considering the relation of groups’ reconstruction.

The dwelling density is in the range from 2 to 6 units per 10 m, with an average of 1 block dwelling and 2 to 3 dwelling units per meter. The building/land ratio is in the range from 0.38 to 0.88. Parking and front yard densities range from 0.07 parking spaces per length of front yard to 0.55 spaces per length of front yard. The ratio of public to private space in the range from 0.03 to 1.43 m². This result can be achieved in a way that facilitates dynamic environment for living and dwelling.

2.2. River networks and pattern of distribution: spatial and physical order

Figure 6 shows the morphological river network of four evolution of connector waterways. It revealed the river network development in different periods. In this basin, *kampung* and conformity boundary lie mainly in the border main river area, while the river network distributed in the waterway variation. There are three types of waterway in Banjarmasin. First, the primary waterway; Barito River, secondary waterway; Martapura River and Kuin River, Tertiary waterway; small river are very clear developed in 1941.

The Banjarese like to develop waterway although with their own budget due to the waterways were very important for transportation access at that time. Therefore, it’s reasonable to assume that urbanization and thousands of small waterways can be found in the city. It was the main factor controlling river network development since 1943. Additionally, the population growth exhibited dramatic increased in 2018.

Structural of river order reflect the main and branch rivers as fractal variation of the act of dwellings and waterways. Each sub structure has its own fractal characteristics. Figure 5 the development of river network shows the distribution of main rivers (3rd-4th layer of order) and the branch rivers (1st-2nd layer order) in since 1943. This trend may have been caused by the channelization of the rivers, which widened and connected the fragments of river sections between 1943s and 2000s.

CONCLUSION

We analyzed connectivity patterns especially spatial and physical order under the formation of a river network and group of *Rumah Bubungan Tinggi*. In this study, we investigate the two-way interplay between the evolution of RBT typology and spatial geomorphological dynamics of landscape pattern.

In the tidal swamp area where the two key changes are the river network structure and composition prototype of the RBT
group, the result shows that as the river network becomes more compact, the RBTs kinship has still remained. The result is less direct in spatial dimension when RBTs and their groups built their common houses within remained spaces randomly. The current condition of the river network seems to become more compact, the common house has spread all over Banjarese Kampungs. This allows remained spaces around RBT to be more dominant growth rather than RBT’s itself. These findings emphasize the importance of understanding the interplay between the evolution of spatial and physical patterns. Such a holistically organic evolution perspective, it is important to propose the letter of understanding among RBT’s group to control spread common house, modern dwellings, and RTBs. It is recommended that to which traditional settlement in swamp areas around the world has changed structural river networks, such as the proposed understanding based on the effects that these changes have on connectivity patterns. It will allow for the improvement of more effective management plans for sustainable wetland development in changing the landscape.

REFERENCES


