

Batang Concepts of Floating Settlement in Barito Basin, Indonesia

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Abstract

The Barito Basin on Borneo Island provides a natural habitat for the floating settlements of Dayak people, which are located along the Barito River and its tributaries. This floating settlement, like other settlements, is the outcome of the people's life experiences, which has resulted in housing that is in harmony with the surrounding environment. The distinctive feature of this floating town is the arrangement of residential clusters on the same floating platform, which allows them to move together as a group. In order to create a settlement, one tribe joins forces with another group. The purpose of this study is to identify, in particular, the ideas that are inherent in and binding on floating settlements, as well as their implications. The findings of the study found *batang* as an inherent and binding concept of floating settlements in the Barito Basin. In this floating settlement, the term *batang* can refer to a variety of things. First and foremost, the people who live in Barito Basin are well acquainted with the phrase '*living in batang*', which refers to the practice of residing in a region known as *batang*. The area along the riverbank that is inhabited by floating settlements is included in this location. Two more uses for *batang* refer to different residential groupings that are all located inside the same base. Third, the base that serves as the home for this residential group is referred to as *batang*. For the fourth time, the term *batang* is employed in reference to the log material that forms the foundation of the floating settlement. *Batang* becomes a concept that has a unique definition and important meaning attached to the floating settlements in the Barito Basin. Batang is not only a physical setting but also a social and cultural place for its people who live floating and rely on rivers.

Keywords: The Barito Basin; the Barito River, floating settlement; *batang*.

Introduction

The Barito River is the longest river in Central Kalimantan and South Kalimantan. From its source in the Schwaner Mountains to its estuary in the Java Sea, it is roughly 864 kilometers long. According to Susilowati (2011), this is also Indonesia's largest river, with a maximum width of 1000 meters near the estuary and an average width of 650-800 meters. The Barito River and its tributaries flow through the Barito Basin. For hundreds of years, the Barito Basin has served as a hub for the cultural development of people who live along the river. Based on the discovery of ancient villages along the Barito River's shore, Sunarningsih (2016) affirms that civilization has existed in the Barito Basin since the Proto-Malay period (2000-1500 BC).

If the settlement forms are traced to their locations, it can be found that each settlement contains patterns and spatial arrangements formed through symbolic communications between physical forms of culture (Catanese and Snyder, 1992; Kustianingrum, 2010; Susanti, 2015; Wulandari, 2015; Kadek *et al.*, 2021). Culture and natural factors have a significant impact on the creation of the settlement's spatial organization as indicated by (Rapoport, 1969; Altman, 1980; Koentjaraningrat, 1990). Cultural activities of the Barito Basin residents also influence

the patterns and spatial arrangements formed along the river's coast in the form of settlement with stilt houses (riverbank settlement) and settlement with floating houses (floating settlement).

Riverside settlements with houses on stilts in the Barito Basin have been studied previously, such as the research conducted by Maulana (2002) on traditional riverside settlements which took a unique location on the Martapura River; Sunarningsih (2016) regarding the distribution of ancient settlement sites in the Barito River watershed towards the Negara River; Setiadi (2017) regarding the concept of revitalizing floating markets as a sustainable means of water-based settlements; Afdholy *et al.* (2019) on the architectural style of riverside settlements in Banjarmasin City; and Mentayani, (2019) about the identity and existence of riverside settlements in Banjarmasin. These investigations established that riverside communities in the downstream area of the Barito River include components of stilt houses and floating settlements. Nonetheless, no mention of floating settlements is made in these studies.

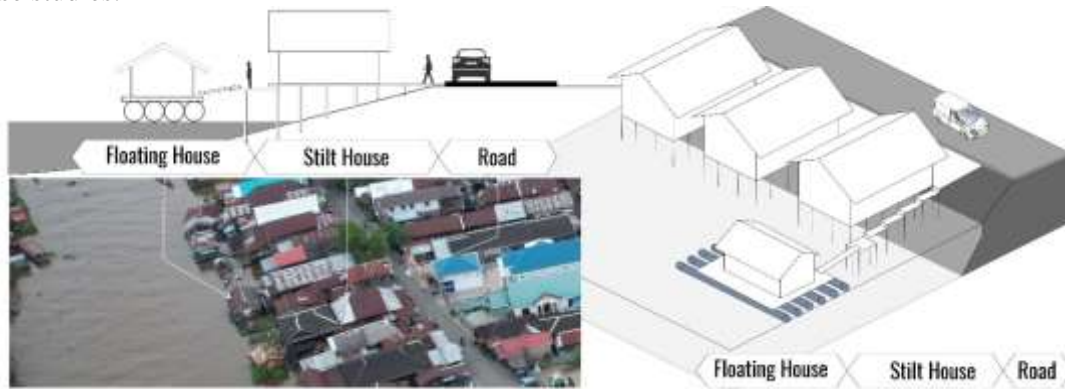


Fig. 1: Schematic illustration of riverbanks settlement in the downstream areas of Barito River
Source: Author, 2021

Although floating settlements are frequently observed in the upstream section of the Barito River, they have never been researched. As a result, our research will concentrate on floating settlements in the Barito Basin. The peculiarity of floating settlements in the Barito Basin that makes them fascinating to examine is the clustering of vernacular settlements on the same floating platform in order to move in unison. This architecture and settlement then become a form of local wisdom with local conceptions. According to Dayaratne (2020) vernacular buildings are embedded in their environments and contribute to their definition and meaning. In the floating settlements of the Barito, a group of vernacular buildings joins another group of vernacular buildings to establish a floating vernacular settlement with the local concept that is inherent in and binding to it. This article will discuss this concept.



Fig. 2: Schematic illustration of floating settlement in the upstream areas of Barito River
Source: Author, 2021

Floating Settlement

The definition of settlements can be classified into two groups: groups that define through physical forms such as Koestoeer (1997) dan Sinulingga (1999), and groups that define physical and non-physical terms such as Doxiadis (1968) dan Trancik (1986). From the physical point of view, settlements consist of land, infrastructure, houses, and public facilities. From the physical and non-physical forms, settlements are defined as *space* and *place*. As Doxiadis (1968) stated, settlements are made up of contents, meaning people both individually and collectively, and containers, which are the settlements' physical surroundings. The *container* is not only a *space*, but a *container* is a *place* where inhabitants (people) do not feel foreign in their surroundings.

Based on the location, settlements can be categorized into urban settlement and rural settlement. Floating settlement is part of the rural vernacular settlement. Several studies related to rural vernacular include Lyons (2007), Dayaratne (2010), Reimão Costa and Batista (2011), Zhao and Greenop (2019), Philokyprou and Michael (2020), and Solikhah and Fatimah (2020).

Regarding research on floating settlements in various countries, there have also been many previous studies, such as the floating fishing settlements on Tonle Sap River in Siem Reap Province Cambodia (Sithirith, 2011; Chau, 2014), floating settlements of Marsh Arabs Iraq/Iran (Hamdani, 2011), floating island of the Uros reed in Lake Titicaca Peru (Méndez, 2009), floating kampung in Tumok Manggis Sambas City West Kalimantan (Lubis, Hardjoko and Susanto, 2017), water-based housing in Mekong Delta Vietnam (Hong Hanh Vu and Duong, 2018; Nguyen, 2021), and floating settlements in Lake Tempe in Wajo Regency of South Sulawesi (Naing, 2020). Each of these floating settlements is very distinct.



Fig. 3: Floating settlement in other countries

Some of the studies mentioned above characterize floating settlements as settlements made up of stilt buildings and floating houses, while others describe them as a combination of both. These examples include the floating fishing villages on the Tonle Sap River, the floating *kampung* in Tumok Manggis Sambas City, water-based housing in the Mekong Delta of Vietnam, and the floating settlements in Lake Tempe in Wajo Regency in South Sulawesi, to name a few examples. A floating settlement is described as a settlement that comprises floating houses, with no other houses on stilts. For comparison, Hamdani (Hamdani, 2011) cited the floating settlement of Marsh Arabs in Iraq/Iran and the floating island of the Uros reed in Lake Titicaca, Peru (Méndez, 2009) as examples of similar instances to the floating settlements in




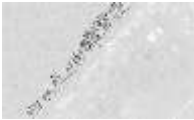





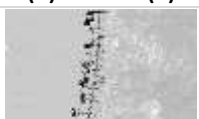
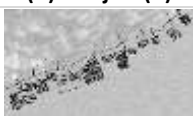












this study. This term is adopted since, in reality, floating settlements and floating houses cannot be distinguished from one another.

According to Strangfeld and Stopp (2014), the global history of floating settlement and floating houses is very complex and widespread across almost all continents, the technique and the design depend on climate boundary conditions, culture, and raw materials which were available in various places. As an example, in the settlements of Marsh Arabs Iraq/Iran (estimated at 5000-6000 BC), the technique and the design depend on the natural environment of marshlands, the culture that developed in the marshlands, the reeds as raw materials that are resistant to water, and their lifestyle that has turned the Marsh Arabs land into a floating settlement that prosperous and fertile land (Hamdani, 2011). The same thing was also found on the floating island of the Uros reed in Lake Titicaca Peru. The purpose of the Uros floating land was originally defensive to avoid the Incas invaders and the Spanish invaders. They build large floating islands on which they built homes, even villages, using bundled dried totora reeds from along the lakeshore as construction materials to build their settlement (Méndez, 2009).

Research Methodology

An initial survey was carried out at each site in order to select which group of residences would be investigated in further depth. The findings of the pre-survey revealed 44 places in the Barito Basin with floating dwellings, however only 23 were recognized as floating settlements, while the remaining 21 were identified as a part of riverbank settlements (Table 1 and Fig. 4).

Table 1: Location
Source: Author

(A)- Muara Joloi -(B)	(A)- Bahitom -(B)	(A)- Beriwit -(B)	(A)- Puruk Cahu -(B)
			
(A)- Muara Laung -(B)	(A)- Hurung Enep -(B)	(A)- Lahei -(B)	(A)- Ipu -(B)
			
(A)- Melayu -(B)	(A)- Jambu -(B)	(A)- Lanjas -(B)	(A)- Jingah -(B)
			
(A)- Pandreh -(B)	(A)- Butong -(B)	(A)- Montallat -(B)	(A)- Tumung Laung -(B)
			
(A)- Tarusan -(B)	(A)- Penda Asam -(B)	(A)- Hilir Sper -(B)	(A)- Bambaler -(B)
			
(A)- Rangga Ilung -(B)	(A)- Sungai Mandala -(B)	(A)- Mantuil -(B)	Description: (A) -"village"- (B) (A)- Upstream (B)- Downstream
			

One floating community location has an extensive reach, with residential groups lining the riverbank in a line along its length. Drones were used to take photos and videos of the settlement in order to get a better overall perspective of the area. In addition, physical observations were made in the designated residential groups in order to have a better understanding of the situation. A variety of factors are taken into consideration when selecting residential groups, including the amount of housing in a given group and the number of residential groups with different residential uses. In addition to the purpose of the housing, the history of the housing, the technique of construction, the way of sourcing the building materials, and the construction of the settlement are all included in the research. Photos, drawings, and interviews with the Head of Village or *Lurah* as well as inhabitants of residential groups are used to gather information for this project.

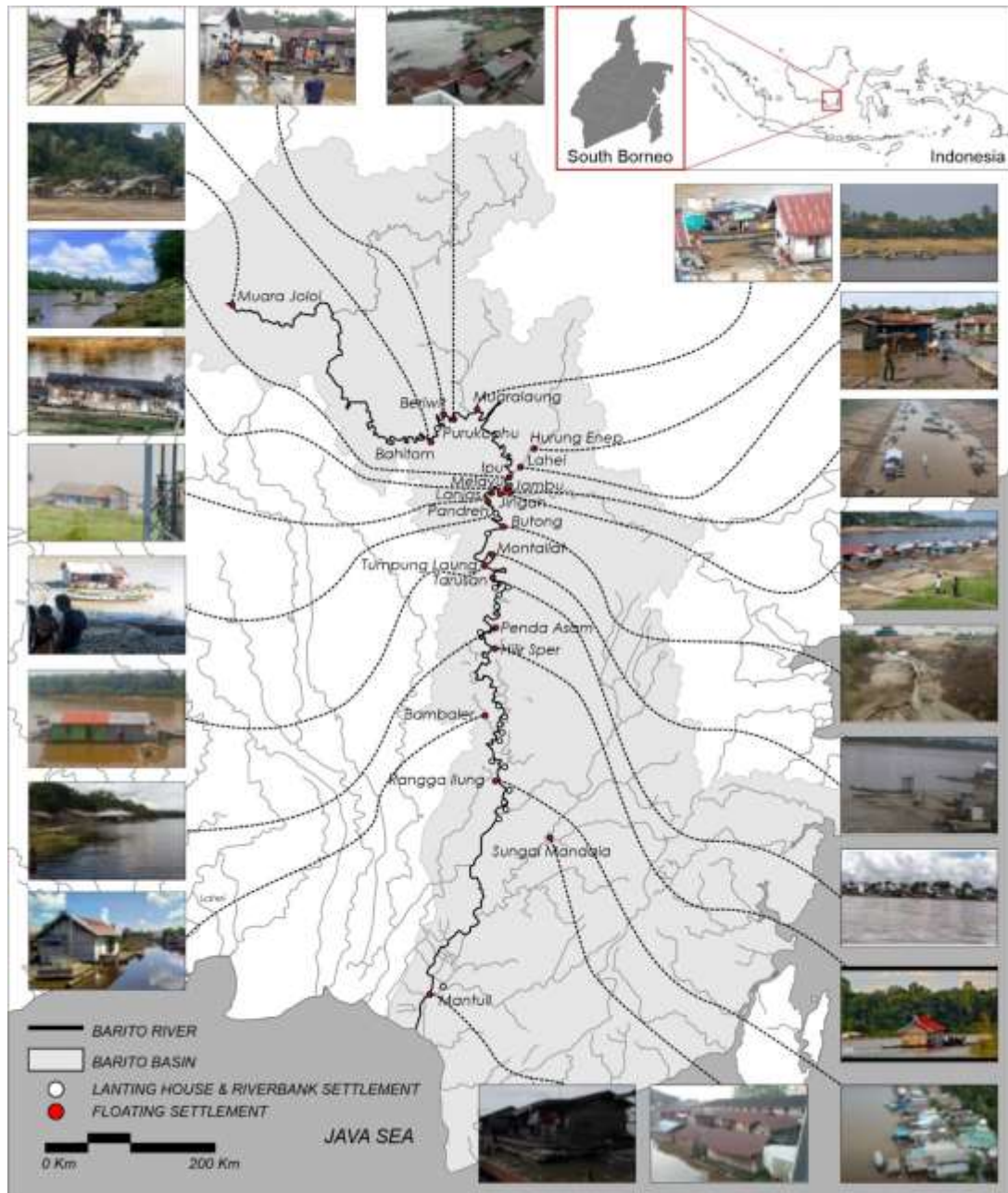


Fig. 4: Location of the study area
Source: Author, 2021

Findings & Discussion

The floating settlements in the Barito Basin were developed due to adaptation to the natural conditions of the Barito Basin, which include rivers, marshes, and mountain ranges, among other things (Fig. 6). The community constructs shelters based on their own personal experience and local knowledge about life on the water. As a result, houses and floating settlements are built, with all materials floating on the water. All of the components of this physical community are constructed using materials found in the surrounding natural environment of the Barito Basin. *Kayu kapur naga* from the *dipterocarp tree* species and ironwood from *eusidroxyton zwageri* tree species are the most often used wood forms.

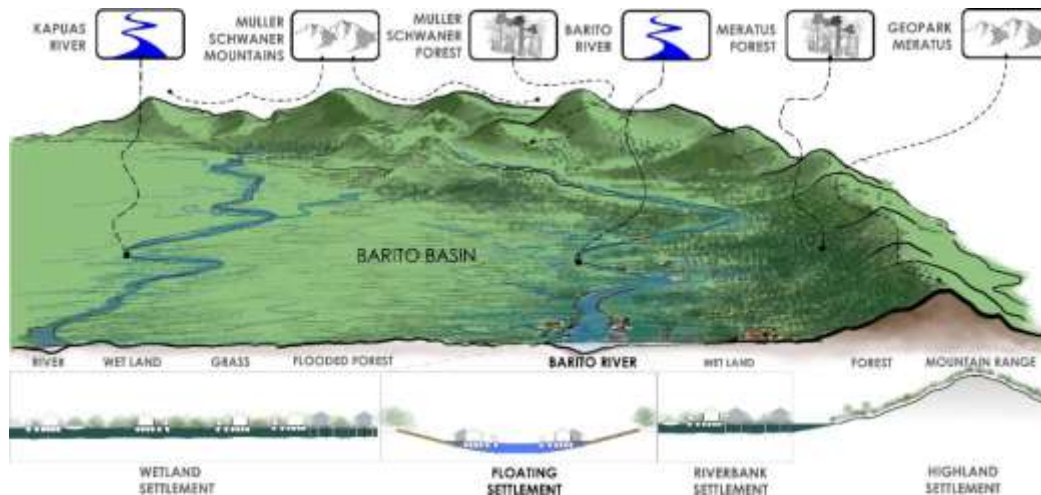


Fig. 6: Schematic illustration of Barito Basin Cultural Landscape

Source: Author, 2021

The floating settlements of the Barito Basin continue to expand and evolve as the Barito River, and its tributaries meander through the area. Each group of buildings is organized lengthwise to form a linear line along the river, which serves as the settlement's main street. Each set of buildings is connected by a *titian* (footbridge). In each building, group are many floating constructions, some of which are referred to by the same term, namely *rumah lanting*, which are used for a variety of purposes such as residential areas, shelters, restaurants, and market stalls. *Jamban* is used for toilet function, *lanting sedot* for gold mining facilities, and hotel *lanting* for lodging function.



Fig. 7: *Rumah Lanting* in the Barito Basin with various functions

Source: Author, 2021

The results of the study found *batang* as an inherent and binding concept of floating settlements in the Barito Basin. The term *batang* in this floating settlement has many meanings, including: *batang* as a place, *batang* as a cluster of buildings, *batang* as a floating platform, and *batang* as a floating material (Fig. 8). The concepts of *batang* will be explained as follows (Fig. 8).

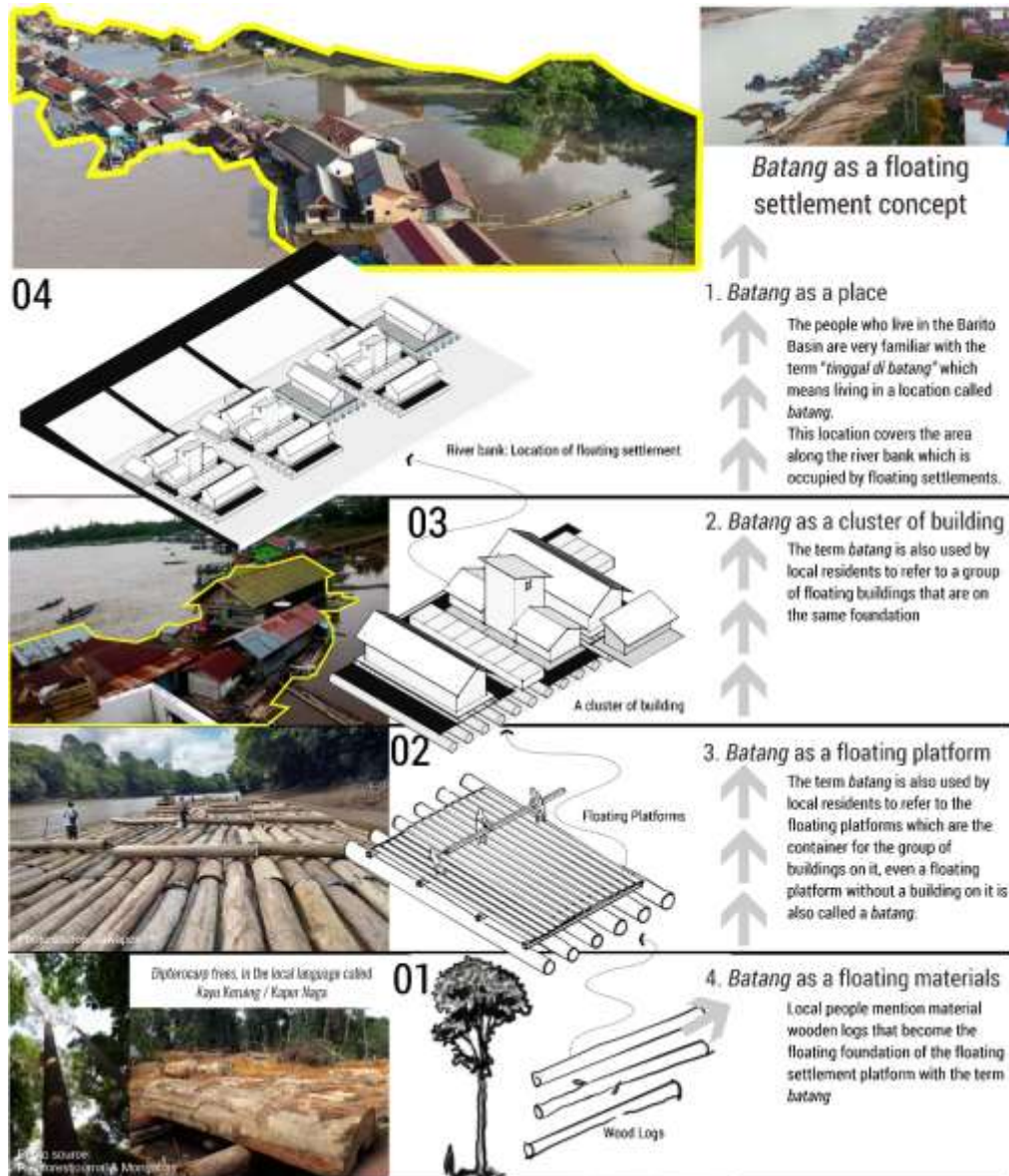


Fig. 8: *Batang* concept and the meanings
Source: Author, 2021

1. *Batang* as a Place

According to theories concerning the notion of settlement, both manufactured and natural physical space are inextricably linked to humans and their lives. *Batang* settlement, as an intrinsic and bound idea, is not only a physical setting (*the container or the space*), but there are activities in it (*the content*), so that it becomes a social and cultural space (*the place*) for its inhabitants who live afloat and depend on the river.

Batang is a physical setting that encompasses the riverside region that juts into the river in this example. The Barito River's tides determine the breadth of the region between the river's margin and middle. When the tide is high, the settlements relocate to the river's edge; when the tide is low, the settlements relocate to the river's center (Fig. 8). Floating settlements grow upstream and downstream of the river until the *batang* area covers the entire area, including the

floating settlements. *Batang* area's length will expand when new building clusters develop, therefore *batang* area's length is dependent on the presence of floating communities (Fig. 9). Floating settlements are composed of many clusters of aligned and orientated structures according to the river's flow pattern to form a linear settlement. These groupings are joined by many *titian* (footbridges), which are basic wooden structures. Additionally, the term *titian* refers to logs that are placed longitudinally between each group of houses and the mainland. This settlement group avoids the intersection of two river currents in the belief that an estuary or eddy will form at the intersection.

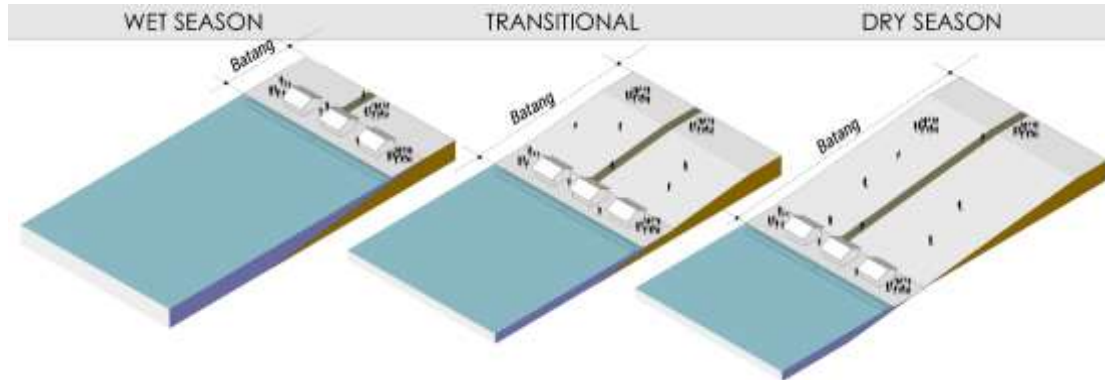


Fig. 8: Lebar area *batang* tergantung pasang-surut air sungai

Source: Author, 2021



Fig. 9: Panjang area *batang* tergantung eksistensi permukiman terapung

Source: Author, 2021

For its role as a social and cultural environment, *batang* serves as a place for its inhabitants to go about their everyday lives, performing activities such as sleeping, bathing, and cooking as well as rearing livestock, fish farming, trading and socializing. *Rumah lanting* are temporary structures where people live and conduct their daily lives. Farming activities (chicken, duck, and swallow) are made more accessible by the construction of floating cages for the chicken, duck, and swallow. The building of fish cages facilitates the operations associated with fish farming. Almost every construction cluster has all of these functions in some form or another. In order to facilitate physical connectivity between building clusters, each building cluster is physically connected by a *titian*. In addition, *jukung* (boat) serves a vital function in the community, allowing people to socialize and obtain food supplies. As a result, each building cluster has a *jukung* mooring spot available.

It is well recognized that *batang* is not just a space, but also a place, as evidenced by the physical, social, and cultural settings described earlier. *Batang* is a concept that holds floating communities in the Barito Basin together and keeps them from drifting away. *Batang* as a place meets the community's demand for shelter while also adapting to the river environment based on the community's knowledge and experience with the area. Additionally, it accommodates the way of life of local people in accordance with their needs, among other things.

2. *Batang* as a cluster of buildings

The term *batang* is also used by local residents to refer to a group of floating buildings that are on the same foundation. These clusters unite to form floating settlements (Fig. 10 and Fig. 11). *Batang* is populated by main structures known as *rumah lanting* serving as residences and are equipped with supporting structures ranging from warehouses, boat garages, fish farming, chicken farming, swiftlet farming, and toilets to commercial functions such as shops, food stalls, and lodging. Each *batang* has around two to five structures, depending on the size of the logs used as platforms. Due to the lack of a particular term for the varied purposes of the building, all structures on *batang* are referred to as *rumah lanting*. According to the theory of settlements Doxiadis (1968), *batang* is the container, and the activities that occur within it constitute is the content.

The Barito Basin's floating settlement is made up of many *rumah lanting* which clump together to form several *batang* groups. *Rumah lanting* is the Dayak tribe's dwelling (Riwut, 1979). The Dayak tribe is well-known as a nomadic and maritime people with a reputation for being fierce sailors (Hudson, 1967; Petersen, 2000). By living on a *batang*, the Dayak tribe travels from location to location in search of food (interview with Ardiansyah, Head of Tampakang Village, 2021). It was initiated at a time when the Dayak tribe was unfamiliar with fish aquaculture. After acquiring knowledge of and getting experienced with fish culture, the Dayak tribe began to settle, and their *batang* settlements tended to cluster in one area.

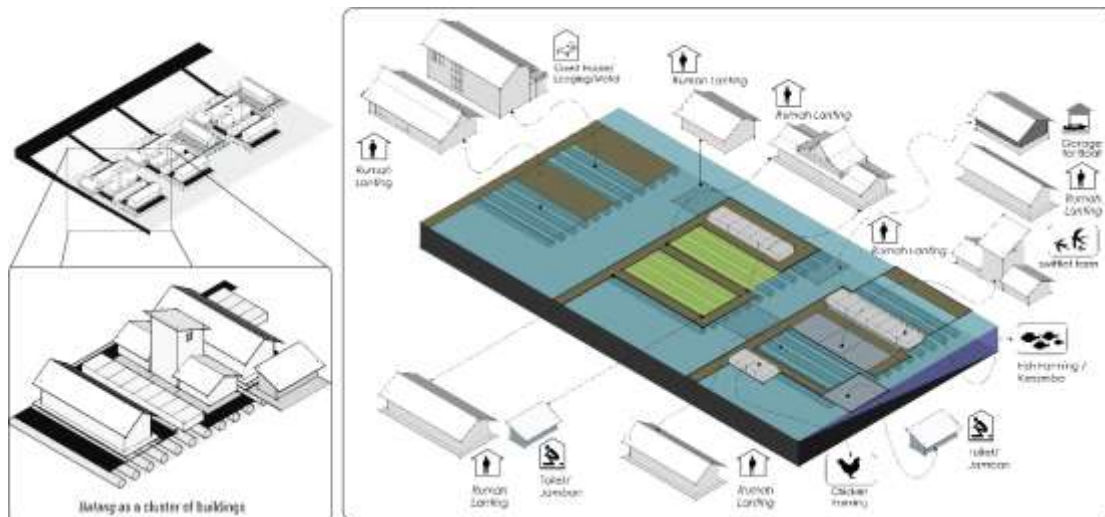


Fig. 10: Batang as a cluster of buildings (1)

Source: Author, 2021



Fig. 11: Batang as a cluster of buildings

Source: Author, 2021

3. *Batang* as a Floating Platform

The term *batang* is also used by local residents to refer to the floating platforms which are the container for the group of buildings on it, even a floating platform without a building is also called a *batang*. *Batang* takes on its physical form by arranging numerous layers of wood (Fig. 12). The lowest layer is made up of big and long logs. Locals refer to it as forest wood. The second and the third layer is comprised of a collection of wooden blocks which is composed of girder beams and floor beams. The fourth layer is the building's floor that an arrangement of ironwood planks (Fig. 12). Ironwood tree (*eusideroxylon zwageri*) material is used in the second to the fourth layers.

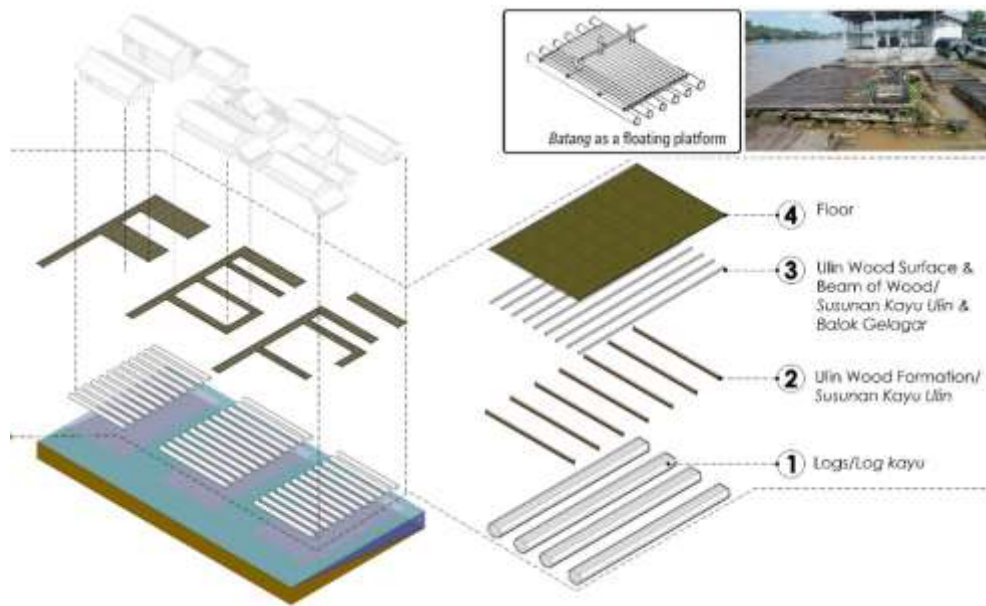


Fig. 12: *Batang* as a floating platform

Source: Author, 2021

If the land settlements have land as the living area, meanwhile the floating settlements in Barito Basin use the *batang* (floating platforms) as the living area. Koestoeer (1997) and Sinulingga (1999) state that the land is used as a residential setting and a location for activities that support residential life. As a *living area*, *batang as a floating platform* serves as a residential, public area that is open to the public. Washing, bathing, buying and selling, bathing, toilets, and socializing are just a few of the activities that take place on *batang* on a day-to-day basis (Fig. 13).



Fig. 13: *Batang*: A floating platform for living area

Source: Author, 2021

Batang as a floating platform is the product of the local community's adaptation to river life, which was made possible by developing technology and materials. When it comes to these floating settlements, the tidal problem of the Barito River is something they have to deal with on a regular basis. The local community's response to the situation is to guarantee that the floating platform remains in place at all times (Fig. 14). At high tide, the rod is pushed towards the ground by a conventional pulley (see Fig. 14). The rope linked to the pulley is hooked to a peg/tree on the ground in order to secure *batang*'s position. In order for the rod to be able to go to the center of the river during low tide, the pulley's rope is released at that time. It has become commonplace to float and move in order to withstand adverse environmental conditions.

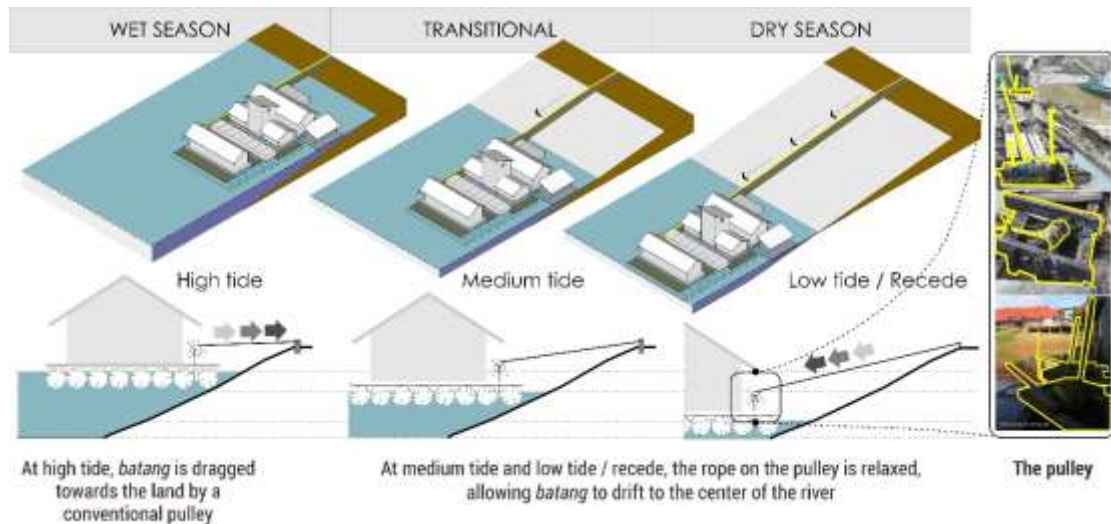


Fig. 14: *Batang* adapt to tidal conditions

Source: Author, 2021

4. *Batang* as a Floating Materials (logwood)

Batang can also be interpreted as logwood. Logwood is wood that has not been treated or treated with chemicals since it was cut from the tree. Logwood is utilized as a floating basis for floating settlements, which allows them to be more mobile. The floating settlements of the Barito Basin, like other vernacular settlements, are constructed from building materials that are readily available in the surrounding environment. For example, the logs used as the floating foundation are sourced from the forest surrounding the Barito Basin environment, which is home to Borneo's endemic trees. These are often huge trees that serve as the basis for floating settlements. Locals refer to them as forest wood. This forest wood is used to construct the Barito Basin's floating settlements. The type of forest wood used is very likely *eusidroxylon zwageri* and *dipterocarp*. Kalimantan is the distribution center for hundreds of *dipterocarp* species, 60% of which are indigenous (Saridan and Wahyudi, 2017).

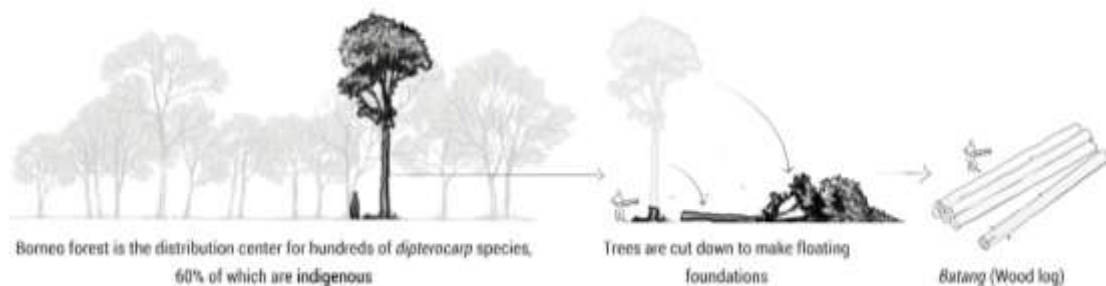


Fig. 15: *Batang*: wood logs

Source: Author, 2021

Conclusion

Floating settlements in the Barito Basin are bound together by an inherent concept that underpins their design. That is referred to as a *batang* concept. The *batang* concept in this floating settlement has many meanings, including:

1. *Batang* as a place. The people who live in the Barito Basin are very familiar with the term *tinggal di batang* which means living in a location called *batang*. This location covers the area along the riverbank which is occupied by floating settlements.
2. *Batang* as a cluster of buildings. The term *batang* is also used by local residents to refer to a group of floating buildings that are on the same foundation. This group comprises four to five residential buildings (*rumah lanting*) and one building with a toilet function (*jamban*), all of which are in the same neighborhood. Settlements are formed by a series of clusters of buildings that are connected by *titian*.
3. *Batang* as a Platform. The term *batang* is also used by local residents to refer to the floating platforms which are the container for the group of buildings on it, even a floating platform without a building on it is also called a *batang*. *Batang*, as a platform, functions as a living area where the daily activities of the people who live in this settlement take place.
4. *Batang* as a floating material. The local people also mention material wooden logs that become the floating foundation with the term *batang*.

Thus, *batang* becomes a concept that has a unique definition and important meaning attached to the floating settlements in the Barito Basin. *Batang* is not only a physical setting but also a social and cultural place for its people who live floating and rely on rivers.

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