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THE PHILOSOPHY OF THE *PONDOK UME* AS AN EFFORT TO OVERCOME FLOODS IN THE RANGKUI RIVER AREA OF PANGKALPINANG, BANGKA

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ABSTRACT

Residential areas around the Rangkui River have become routine flooding due to hightides with high rainfall. However, residents around the Rangkui River do not want to move to a new location because they have lived there for decades and require significant costs to move to a new location. The big flood that hit the community for the first time in Bangka Belitung in 1986 andagain in 2016 was the most significant in the Bangka Belitung region. The problem of this research is how residents around the Rangkui River area can stay at home even though flooding is happening. This research aim is to find solutions for buildings that adjust to the conditions around the Rangkui River to overcome flooding.The research method used is direct observation with a qualitative descriptive approach by analyzing the causes of flooding in the Rangkui River area and finding the right solution. The result of this research is to revive the philosophy of Bangka Belitung traditional houses (Pondok Ume) as one of the solutions.

Keywords: *Rangkui River, Flood, Pondok Ume, Pangkalpinang*

1. Introduction

Houses on the banks of the Rangkui River have existed for a long time. The Rangkui River is a transportation area and serves as the main channel for rainwater collection or an irrigation canal. Now, the area is a densely populated settlement and a frequent flooding area. When there is high rainfall, the sea level rises. There have been two major floods and one subsequent flood.

The first flood in 1986 and the second in 2016 also hit the Rangkui River area. “Floods like this have already happened in the second week of January 1986, at that time because of high rainfall and then added by the rising tide of seawater, so that part of the city was submerged. The city is concave, 75 decimeters below sea level [1].

Currently, the residents are still staying in their houses with a position under the road and a small drainage in each house that can experience flooding at any time if the sea level rises. Because it has been generations in the area and also requires much money, the community does not want to movefrom the area, so a solution is needed to overcome the flooding that befalls residents around the Rangkui River. The purpose of this research is to find a solution to the shape of the building that adapts to the conditions in the area around the Rangkui River to overcome flooding.

2. Material and method

2.1 Theoretical Review

2.1.1 Definition of Flood Disaster

A disaster is an event or series of events that threaten and disrupt people’s lives and livelihoods caused by natural and non-natural factors and human factors resulting in human casualties, environmental damage, property losses, and psychological impact [2].

Flooding is the event or state in which an area of land is submerged due to an increased volume of

water [3, p. 191]. A flood disaster threatens and disrupts people's lives and livelihoods, resulting in human casualties, environmental damage, property losses, and psychological impacts [4].

2.1.2 Types of Flood

Floods can be divided into five types as follows [5]:

1. Flash Floods are hazardous floods because they can carry away anything. This flood can cause severe damage. Flash Floods usually occur due to deforestation and are proneto occur in mountainous areas.
2. Water Flood is a prevalent type of flood, usually caused by overflowing rivers, lakes, orsewers. Because there is much intensity, the water is not accommodated and overflows.
3. Mud Floods are similar to flash floods, but mud floods are floods that come out of the earth and reach the land. Mud floods contain harmful and gaseous materials that affect the health of other living things.
4. Rob Flood (Tidal Sea Flood) is a flood that occurs due to seawater. This flood usually hits areas around the coast.
5. Cileunang floods are similar to water floods, but Cileunang floods occur due to heavy rains that are not accommodated.

2.1.3 Causes of Flood

Factors that cause flooding are [6]:

1. Influence of human activity, i.e.
   a. Utilization of floodplains used for industrial settlements.
   b. Deforestation reduces soil infiltration and increases surface soil runoff, resulting in erosion and sedimentation of the river channel, disrupting the water flow.
   c. Settlement and development in floodplains and poorly planned waterways result in poor river flow and flooding.
   d. Littering can clog waterways, especially in residential areas.
2. Natural conditions that are fixed (static), such as:
   a. Geographical conditions are located in areas often affected by storms orcyclones, for example, some sunken areas, Bandung.
   b. The condition of the river channel, such as the slope of the riverbed being flat,meandering, blocked, or in the shape of an island.
3. Dynamic natural events
   a. High rainfall
   b. Damming or backflow often occurs at river mouths or major river confluences.
   c. Land subsidence or subsidence caused by excessive groundwater extraction resultingin lower ground level.
   d. It was silting of the riverbed due to high sedimentation.

2.1.4 The Stilt House

The Stilt houses inherited from traditional architects are a hallmark of Indonesian architecture. The concept of Stilt houses is guided by traditional wisdom that calls for harmony between the macro and micro cosmos and reflects the values of friendship and harmony with the universe. The principle of healthy and earthquake-resistant Stilt houses should be maintained in villages and cities. Especially in water catchment areas, coastal and mountainous areas must be preserved [7].

The shape of the Stilt on the *Pondok Ume* means that the house or hut used is a glorious place for people who live or occupy it (the word *Panggung*/stilt etymologically comes from the word *pang* which means place, and the word *Gung,* which means glorious). It is a great place because the *Pondok Ume* or house is built by elevating the *Pondok Ume* from the earth or land on which every living being stands and various activities—characteristic of the *Pondok Ume* (See Figure 1) [8]:

1. The house extends to the back with a *plana* roof (called *Bubung Gudang*)
2. The canopy (*Liper*) is made of thatched material (*Atep Rumbia*).
3. Walls made of bark.
4. The floor is made of wood (called *Jerejak*), usually using *Nibung* trees

5. *Pondok Ume* is about 50-150 cm above ground level on the Stilts.
6. The front building zone with doors (called *Lawang*) and windows (called *Tebek*) on the front side and the kitchen at the back stands on the ground, and there are an odd number of wooden stairs in front of the house with the count: stairs, wait, stay.
7. 9 poles *Pondok Ume* or houses are usually built on nine poles, especially after the introduction of Islam in Bangka. Nine poles mean nine saints (*Walisongo*). Each pole is named the ordinary pole, the main pole, and the *Aras* pole in the center position. It is called the *Aras* pole or *Arasy* or *Arsy* because it is used as a symbol leading to the highest throne, namely God Almighty.
8. *Cespit/Limbahan/*back area.
9. The roof, the roof's construction on the *Pondok Ume* or house, is called *bubung* or *Membubung*, which means that the Stilt house also establishes a relationship with the Creator (God).
10. The skeleton of the roof is called *rabung.*

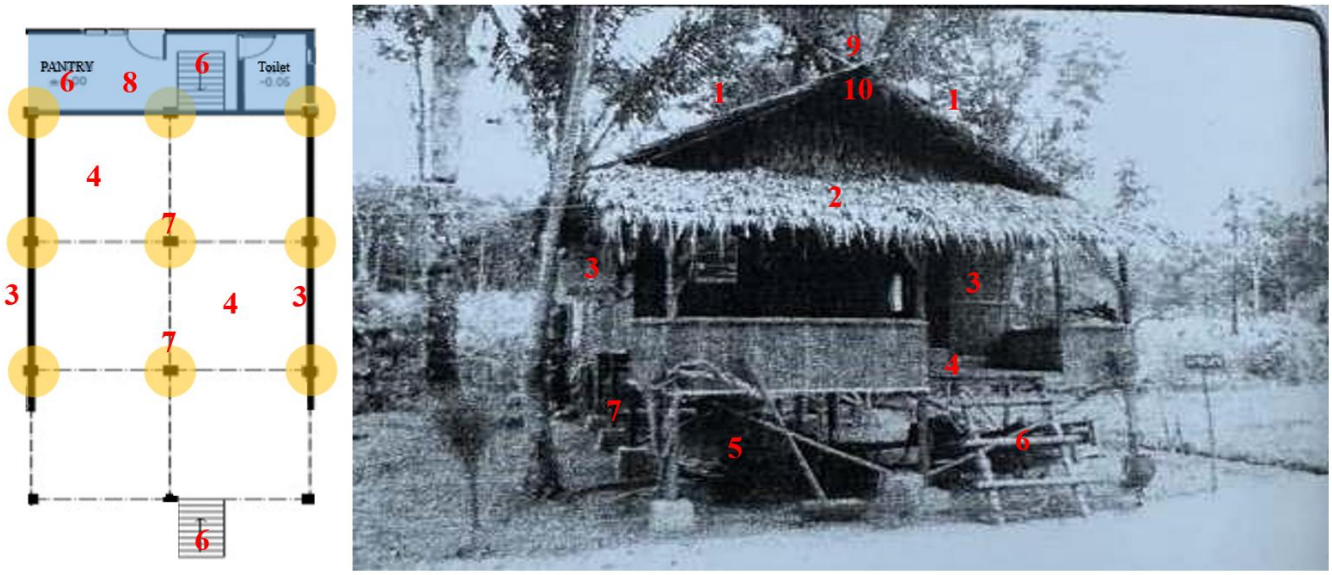

Figure 1. *Pondok Ume.*
Source: *Memarung*, *Panggung*, *Bubung*, *Kampung* & *Nganggung* [8, p. 95]

Based on the theoretical study above, the research indicators to be analyzed are as follows: First, understanding the philosophy of stilt houses (*Pondok Ume*) that would be used as an alternative solution; Second, examining existing houses to determine the height of stilt houses based on the highest or average flood conditions around the Rangkui River; Third, trying to apply the philosophy of stilt houses to change existing houses to avoid flooding.

2.2 Research Method

This research uses the observation method with a descriptive analysis approach, namely describing and analyzing the philosophy and the form of building houses that cause flooding in the Rangkui River area. Observation is the process of obtaining first-hand data by observing people and thelocation of the research [9]. The descriptive analysis research method is a method for obtaining in-depth data that contains meaning and can significantly affect the substance of the research [10].

The research location in the Rangkui riverbank settlement in the Taman Sari sub-district isbetween Jl. Kenanga, Jl. Abdullah Addari and Jl. KH. Abdul Hamid.

3. Result and Discussion

A house on Stilts is a construction system with a floor plane raised from the ground (or water) surface, with its supporting poles [11]. A common feature of the vernacular Stilts houses is that they are made of planks or bamboo, with the kitchen part not having the stilt [12].

The Stilt houses are usually built about 50-150 cm above ground level to avoid puddles and attacks from

wild animals such as snakes and venomous insects. The lower part of the Stilt is also used as a warehouse for storing work tools in the field or *Ume*, for the pets live, such as chickens (*Tekeret*, where chickens lay eggs and incubate eggs), and even as a place for pet dogs to guard fields and gardens and *Berasuk* (hunting using *asu* or dogs) [8, p. 15]. The advantages of Stilt houses include flood protection, view maximization, ventilation expansion, aesthetics, and the application of sustainable development principles [13].

Some of the Stilt houses are not all on the Stilts, but only some rooms are elevated. For example, the kitchen is placed at the back of the house, not on the Stilts, but on the ground, sometimes without a base. The kitchen for cooking is usually built with *Para-para* or *Pepare* to store fish, dried/smoked meat, or other kitchen utensils [8, p. 19]. The kitchen of the Stilt house located below or outside can facilitate access to water and fire sources and reduce the fire risk. From a cultural point of view, the kitchen under the Stilt house follows the customs of the ancestors of each region. This is because the cooking process is still traditional, requires a large space, and does not use sophisticated equipment like now [14].

Researchers took one house object on the banks of the Rangkui River and interviewed the house's owner regarding the flooding in the house. This house belongs to Mr. Badri with an existing plan, has 3 bedrooms (see Figure 2), and has experienced several floods, the highest flood in 2016 with a height of 1.7 m, and the rest is in the range of 20-80 cm Flood marks are visible on the house's walls, and the outside has beenrepainted several times, but there are still marks due to flooding. The condition of the houses around the Rangkui River also has a similar case to Mr. Badri's house (see Figures 3 and 4).

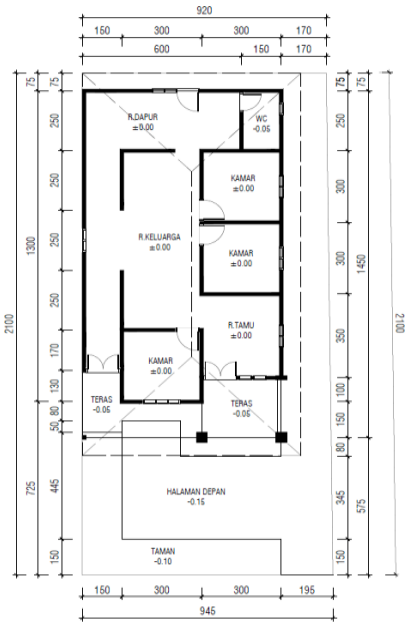

Figure 2. The existing floor plan of Mr. Badri's house
Source: Authors, 2023

Figure 3. Flood marks are visible on the house's walls.
Source: Authors, 2023

Figure 4. The houses around the Rangkui River also have a similar case to Mr. Badri's house
Source: Authors, 2023

Based on observations of flooding that occurs on the banks of the Rangkui River:

1. Water Flood is a prevalent type of flood; usually, this flood occurs due to the overflow of river, lake,or sewer water because there is much intensity so that the water is not accommodated and overflows; that is water flooding.
2. Rob Flood (Tidal Sea Flood) Rob flood is a flood that occurs due to seawater. This flood usually hits areas around the coast.

From the theory of flooding causes, flooding around the Rangkui River is included in dynamic natural events, as in the points: (1) High rainfall and (2) Damming or backflow often occurs at river mouths or major river confluences.

The application concept of the Stilt houses in the research object of Mr. Badri's house as seen in Figure 5-7:

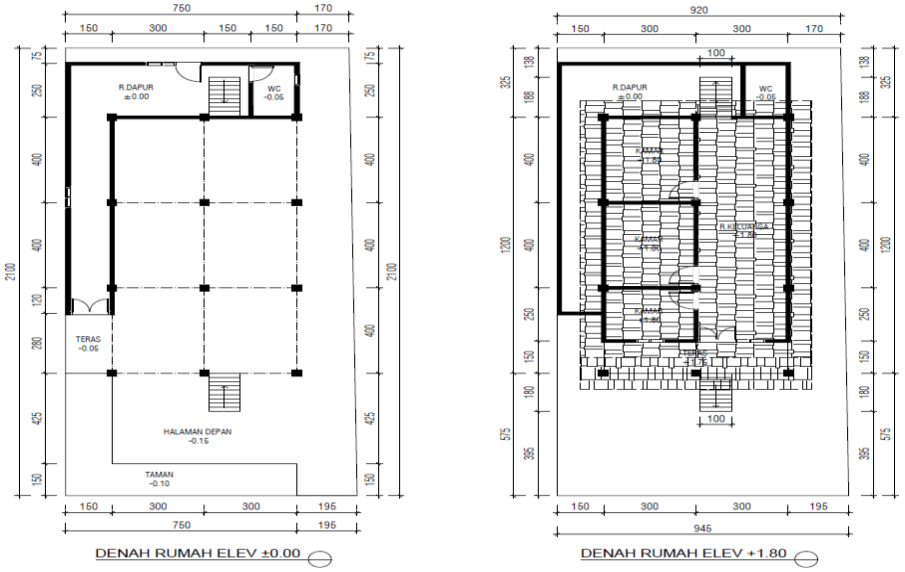

Figure 5. Floor plan drawing of a Stilt house on Mr. Badri's house
Source: Authors, 2023

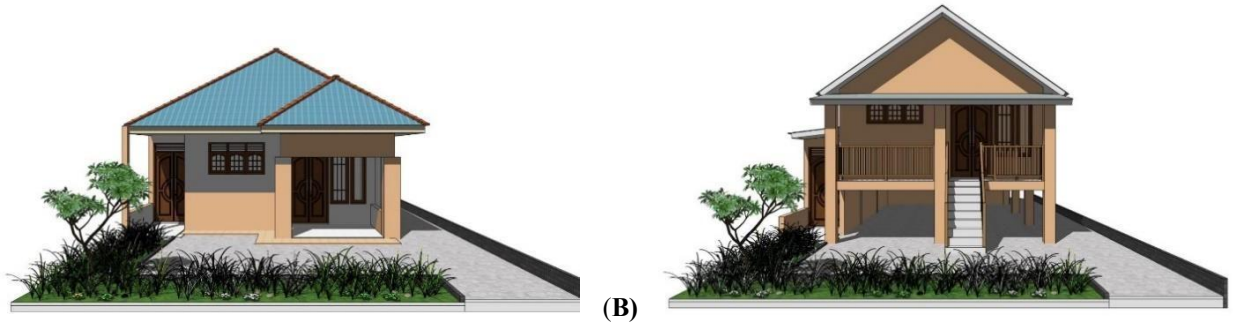

Figure 6. Drawings of existing facade plan (A) and the Stilt house concept (B) of Mr. Badri's house
Source: Authors, 2023

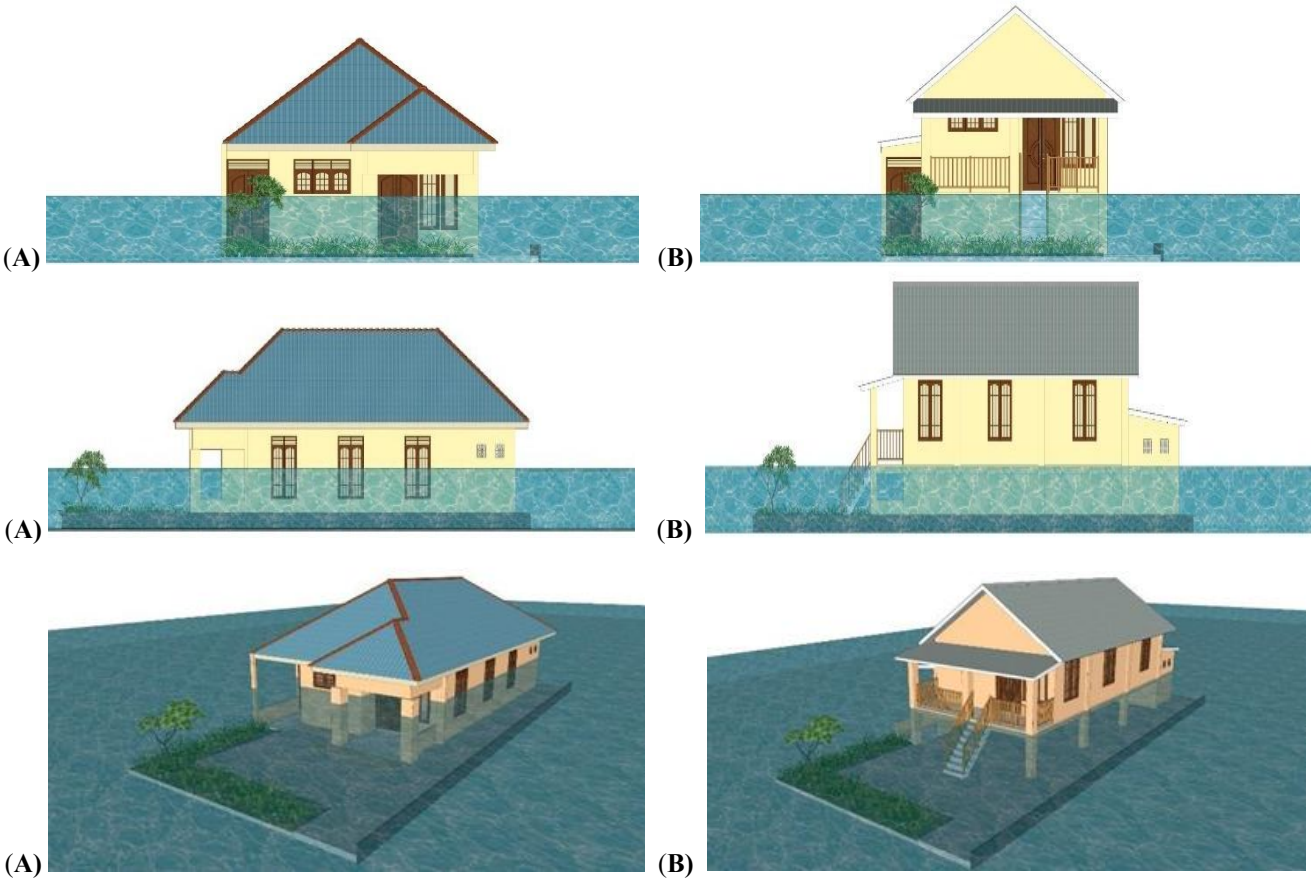

Figure 7. Simulation image of existing 170 cm flood (A) and the Stilt house concept (B)
Source: Authors, 2023

A flood-safe treatment plant requires the position of a latrine pit, air vent, and treatment plant outlet to be protected from floodwaters, especially in flood-prone areas. This is to prevent flood water from entering the system, which would cause the treatment plant to fill up faster or even overflow, polluting the environment [15]. The following picture simulates the sanitation system of Mr. Badri's house using a Bioseptic tank. Even in flood conditions, the sanitation system can still run well (See Figure 8).

Figure 8. Simulated image of the sanitation system and evacuation conditions by canoe during a big flood
Source: Authors, 2023

4. Conclusion

The philosophy of the *Pondok Ume* (Stilt House) can be an alternative solution to overcome flooding in the Rangkui River Area of Pangkalpinang, Bangka. The Stilt House can be an alternative to avoid flooding if supported by good facilities and infrastructure. Adequate and clean drainage channels, planting trees or plants in the yard so that water does not spread directly but can be absorbed by plant roots.

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