

Asian Architecture [ARC 2213/2234]

PROJECT 1: CASE STUDY

**ADAPTATION OF RUMAH KUTAI MALAY VERNACULAR
FEATURES IN KAMPUNG HOUSE OF BELUM RAINFOREST
RESORT**

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Adaptation of Rumah Kutai Malay Vernacular Features in Kampung House of Belum Rainforest Resort

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Abstract

The purpose of studying the adaptation of vernacular architecture in Belum Rainforest Resort, which is a modern building, was to promote the continuity of vernacular architecture in our generation. Vernacular features of the Kampung House in Belum Resort were being analyzed in terms of its spatial elements, materials, structural and non-structural components. A comparison about these features was then conducted between the Kampung House and the traditional Rumah Kutai in Perak. A site visit to Belum Rainforest resort allowed us to collect information and take relevant pictures. Research from online sources and published book was done to gain knowledge about the malay vernacular architecture. The features of Traditional Malay House reflect the needs, economics, traditions, and social interactions of the inhabitants. As time passes by, factors affecting the design of the Traditional Malay House change, in order to fulfill the needs of the modern people. Hence, it was concluded that the Kampung House in Belum Rainforest Resort differed remarkably from the Rumah Kutai. Nevertheless, it had a very positive approach in maintaining the continuity of vernacular architecture in Malaysia and also towards sustainability.

1.0 Introduction

Vernacular architecture is regarded as a form of architecture with a low or no design process. Malay vernacular architecture has a rich historical background and is unique from one place to another. Its dissipation from the modern society urged the need to conserve it. Architect of Kampung House in Belum Rainforest Resort phase 2 has attempted to apply vernacular features from Rumah Kutai in Perak. Kampung House is a rather modern house compared to the traditional Rumah Kutai.

The adaptation of the features in Kampung House of Belum Rainforest Resort phase 2 will be discussed thoroughly based on these questions:

1. What are the features of Malay vernacular architecture in Rumah Kutai?

2. How is it applied in the Kampung House of Belum Rainforest Resort?
3. How are the features similar to Rumah Kutai?
4. How does it differ from the original features in Rumah Kutai?
5. What is the purpose of the differentiation from the original feature?

2.0 Overview of Rumah Kutai

Rumah Kutai is a traditional Malay House located in Perak. Existing ever since the 1800s, Rumah Kutai is the oldest of its kind, and it has a significant historical value. Like any other vernacular architecture, Rumah Kutai reflects the culture and lifestyle of the inhabitants, in this case the Malays in the older days. Rumah Kutai is always erected in front of the river, which the people depend on for their needs and survival.

Its construction displays a high quality timber craftsmanship using high-end materials which was much more affordable in the past. Unlike other traditional Malay houses where the levels of the spaces differ according to its importance, Rumah Kutai is built on the same level. The walls and floors are made up of bamboo matting. It is harder to maintain than modern construction.

The number of Rumah Kutai that is still remaining is getting lesser, due to the harsh tropical condition and other natural disasters, which caused damaged to the building. The restoration of the damaged building is very challenging, as the materials resources are not readily available now. Hence the building would be restored by using different materials and construction method, and no longer maintaining its authenticity. Of these remaining houses a lot were abandoned and prone to further damages.



Figure 1. The only remaining Rumah Kutai in Kuala Kangsar

3.0 Features of Malay Vernacular Architecture in Rumah Kutai

In a Malay kampong or village, the housing units are detached and dispersed with open spaces to allow fresh air circulation. Rumah Kutai is arranged linearly, facing the river. For religious purposes, the house is oriented such that the shorter façade is facing Mecca, the east-west direction (refer to Figure 1). This minimizes the area of walls that is exposed to sunlight.

3.1 Spatial Elements

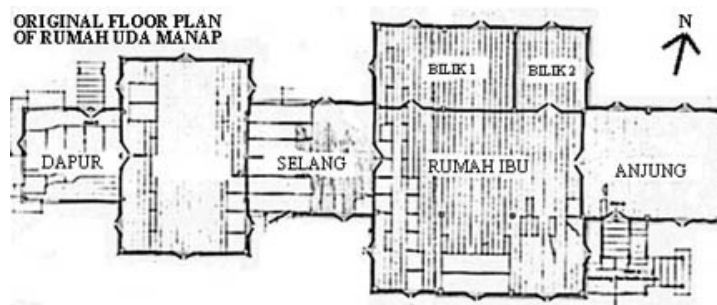


Figure 2. Floor Plan of a Rumah Kutai

Rumah Kutai is usually divided into two parts – Rumah Ibu and Rumah Dapur. The interior spaces in traditional Malay house are multifunctional and its function changes depending on the time of the year. There are less furniture and most of the activities are done on the floor.

Rumah Ibu is the space with the highest hierarchy here. In daily basis it is used by the inhabitants to relax, read, mingle and sleep. Family functions like engagements and treating guests or relatives are also held here. The lighting in this space is usually dim, to give a sense of coolness. Instead of having solid partition, spaces in Rumah Ibu are usually separated by cloth, which gives the space more flexibility.

Rumah Dapur is the second biggest space in Rumah Kutai. It is located at the back, and functions as a space for cooking, washing and eating. Family

members will have their meals here during family gatherings. It is also a place where women will gather and chat.

Serambi is the public space through which male enters and guests are greeted. It is the smallest space in the house. It also allows inhabitants to interact with the neighbors. Sometimes it has no perimeter walls, to create a semi-outdoor space with natural lighting from the openings. There are two entrances in the traditional Rumah Kutai, one for males and the other for female.

The entire space is long with open plans and less furniture, to allow cross ventilation.

3.2 Construction Elements

3.2.1 Structural Components

In Rumah Kutai, there is no foundation used. Usually there would be 12 or 16 main pillars. These pillars are not inserted into the ground, but resting on top of a concrete base instead.

Prefabricated post and lintel timber structure is used, so Rumah Kutai can be dismantled and reassembled from one place to another. The structure might collapse when natural disaster hits. Even so, the ability of Rumah Kutai to be moved from one place to another is advantageous for the villagers. The outbreak of a disease is a common thing in the past, so villagers have to move in order to survive. Moving house in that time literally means disassembling the structure and rebuilding the house somewhere else.

Roof in Rumah Kutai is supported by king posts and wooden posts. It has a large overhang, which provides shading for the walls, and prevent rain from entering the windows. Bamboo pieces, which are hollow in the middle, are used on the roof to provide drainage

for rainwater. The roof has no ceiling so that air can circulate well, cooling the house to achieve thermal comfort. The gable end is made up of the same material like the walls, catching wind and directs it to the roof space. Palm leaves used to cover the roof would have to be changed regularly and therefore is hard to maintain. Nowadays, it has been replaced by zinc roofing.

3.2.3 Non-structural Components

Windows are delicately carved to provide beautiful ornamentations on the top part and allow just adequate light to penetrate into the interior spaces. The middle and bottom part is louvered, and allows wind to pass through. Social class of the family occupying the house can be determined by the detail of the ornamentation.

The entrance doors for guests are purposely made low. Malay culture believes that guests shall bow to pay respect to the owner of the house. By having low door, the guests would have to bow in order to pass through.

Ventilation in Rumah Kutai does not depend solely on windows and doors, which are placed in the body level, but also the decorative elements, which allows prevailing winds to penetrate into the interior.

Floor in Rumah Kutai is highly raised, as a precaution from flooding, to prevent wild animals to get into the house and at the same time aids in capturing wind of higher velocity. Food stocks, fuels, bicycles as well as live animals can also be stored in the space below this floor, which is called 'Kolong'. During rainy season, it is used as a place to dry clothes.



Figure 3. Raised floor of Rumah Kutai and its functions

The flooring in Rumah Kutai consists of strips of wood nailed onto floor joists, with some gaps in between each. These gaps are for cleaning purposes, to remove dusts during sweeping and water when washing, especially in the kitchen area. It also serves for religious needs, like bathing the deceased body of a family member. In the case of flood, water will penetrate into the house through these gaps, instead of floating it away.

3.3 Materials

The materials used in Rumah Kutai have low thermal mass and can be obtained from local resources. Malaysia has a tropical climate and by using materials with low thermal capacity very little heat is released into the building. The main materials used in Rumah Kutai are high quality timber, which was cheap and widely found during the older days. Bamboo mat is used to cover the walls and floors. It allows wind to pass through and create cross ventilation, and also reduces glare.

Even though nails are available by then, it is not used extensively. Timbers are pre cut and jointed by tongue and groove method, to allow flexibility.

4.0 Adaptation of the vernacular features in Kampung House

Kampung House of Belum Rainforest Resort has adopted some vernacular features of the Traditional Malay House. Kampung House is no longer serving the same function as a permanent dwelling, but as a temporary retreat house for vacation.

Completed in mid 2013, the Kampung House is built in a rather modern site context. Like the other buildings in Belum Rainforest Resort, Kampung House is designed with sustainability in mind. It results in a unique combination between modern and traditional. It is available in 1-3 bedrooms type, which is separated with solid wall instead of movable partitions as in Rumah Kutai. Instead of making use of only local materials for all its construction, it also uses shera wood, which is synthetic wood made of fiber cement, for its wall.

Like Rumah Kutai, it depends mainly, but not solely on natural ventilation to achieve thermal comfort. The presence of full-length windows and doors, with minimum furnishings inside allows cross ventilation.

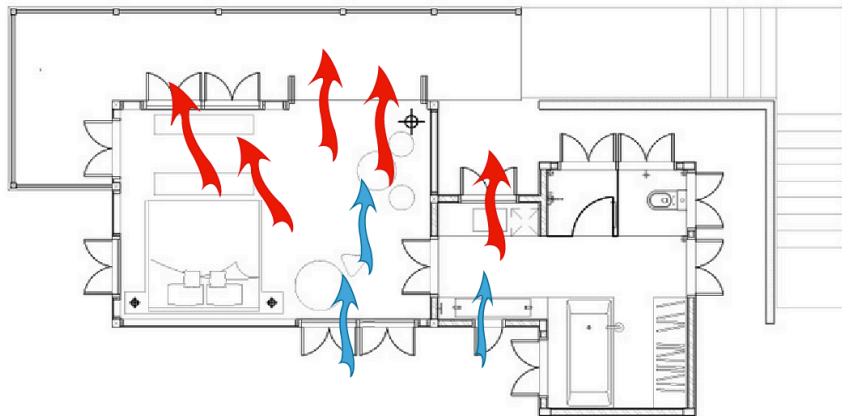


Figure 4. Cross ventilation in Kampung House

Like Rumah Kutai and other traditional Malay house, the Kampung House has simple rectangular spaces. Private areas are marked by the presence of wall in all four sides, while semi private and public areas are semi open.

As Kampung House is only meant for temporary stay, it lacks the presence of kitchen and proper living room.

5.0 The Similarities of Vernacular Features in the two Buildings

The biggest similarity between Kampung House and Rumah Kutai would be its arrangement. The Kampung House is not attached to one another and is linearly aligned, such that every unit has a direct view to the lake.

Another significant similarity is the use of simple geometry in its space, and the presence of numerous architectural elements to promote natural ventilation. Large overhangs are also present in Kampung House, to prevent excessive sunlight from getting into the interior. This results in a dark interior space, which gives a sense of coolness.



Figure 5. Large overhang (left), which prevents excessive sunlight to enter to the interior space (right)

It makes use of some locally obtained materials, such as the rammed earth, which helps to shade the walls exposed to sunlight. Timber is used as the flooring of the house. The materials are modestly used, expressing aesthetic on its own rather than enhanced with paint or decorations. For example, bare concrete is used here to give a poetic feel and also to keep everything simple and back to basic.



Figure 6. Modest materials used in the Kampung House

Traditional Malay house reflects the social interaction of the Malay communities, which is rather active as determined by the presence of interactive spaces. In Kampung House the entrance is a spacious corridor. Its semi outdoor dining room provides informal space to entertain guests, with a direct view to the greens and the lake. The interactive spaces are outside to limit the access of guests into the private spaces, and to allow the people to appreciate the surrounding nature as they were chatting. Even though the houses are apart from each other, it has very low barriers, which enables interaction from the occupants of one house with another. There is a main road in front of the houses, which connects to the other clusters and is meant for walking rather than transportation.

There are also gaps in the wood flooring of Kampung House, for cleaning purpose.



Figure 7. The gaps in the wood flooring in the outdoor area

Both Rumah Kutai and Kampung House have double slope roof, to allow more air movement to ventilate the house. The roofs in both are made of materials with low thermal capacity. In Rumah Kutai attap roof is used, while in Kampung House white-color shera wood is used.



Figure 8. The air movement through the spaces in between the roof



Figure 9. The roof as viewed from the interior.

6.0 The Differences of Vernacular Features in the two Buildings

The most visible differences of Kampung House and Rumah Kutai would be the proportion of the house. In Rumah Kutai, the stilt and walls height has a proportion of X, and the height of the roof has a proportion of 2X. Whereas in Kampung House, it can be seen that the walls has the most height, followed by the roof and lastly the stilts. The stilt in Kampung House is only around 50 cm high, while in Rumah Kutai it is higher than 1 meter. The number of columns is not limited to the 12 or 16 main posts anymore. There is foundation, made of steel material in Kampung House.

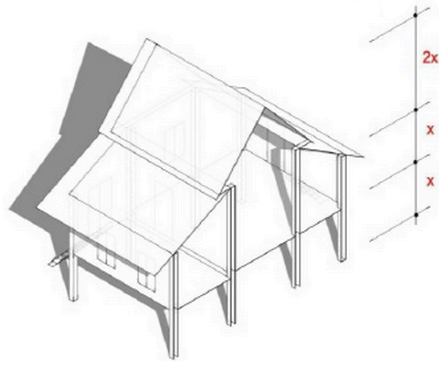


Figure 10. Proportion of traditional Malay house



Figure 11. Exterior view of Kampung House



Figure 12. Short stilt compared to height of the house

Another significant difference is the materials used. While Rumah Kutai uses timber, bamboo strips and other raw materials, in Kampung House synthetic wood like planks, laminated timber, glass and concrete is used.

There is no dapur present in Kampung House, as the occupants were encouraged to have their meals in the restaurant instead of having to cook by their own. The façade of Kampung House is kept simple with no decorative elements. Windows are no longer separated into three components, but as one whole structure with no ornamented fixed panels. The absence of ornamentations is due to the scarcity of skillful craftsmen and the materials itself. There is only one entrance instead of two, and the door is now made full length.

6.1 Factors Affecting the Differentiation

Foundation is needed because the Kampung House is erected on the hill. Also, there is no need for it to be dismantled and moved to other place, so securing the structure with strong foundation is advisable. The stilted floor in Kampung House is not as high as the one in Rumah Kutai because it does not have to serve the purpose of storage, and keeping the inhabitants safe from wild animals and flood. Using high stilts would increase the cost of the construction, and a low stilt is adequate for wind to pass through to cool the building as it is built on the hill. The walls of Kampung House are higher than Rumah Kutai to avoid giving a cramped feel, as its area is relatively lesser.

The difference in materials is caused mainly by the shortage of the raw materials, for easier maintenance, and enhances its durability. The high quality timber used in Rumah Kutai was widely available and cheap during the time, and there are a lot of local carpenters and craftsmen who can work with the timber to make beautiful structures. Nowadays, it is hard to find this high quality timber and it becomes a high price material. Bamboo strips have to be regularly replaced, so it is not sought after anymore.

In this modern era where trees shall be conserved and timber is getting rare, shera wood becomes a great replacement. It has a wooden appearance, while entirely made of non-natural materials. Concrete is used to separate the interior spaces as it gives



Figure 13. close-up of shera wood used in the roofing

The equality between different genders makes it unnecessary to have separate entrance. Also, the culture of taking a bow to respect the house owner is not so obviously emphasized.

7.0 Conclusion

Kampung House differed significantly from the traditional Rumah Kutai. Its approach to vernacular architecture is a positive one, although can be better improved. The presence of Kampung House in Belum Rainforest Resort allows people to experience what it was like to live in a traditional Malay house, with a more proper amenities provided by its modern design. Seeing the great difference of the two buildings shall open the eyes of the people to conserve the remaining Rumah Kutai and other traditional Malay house. It is no longer a choice, but a need to conserve these national heritage for the future generations to appreciate.

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