Sustainable functions of Kolong of Pekon Hujung traditional house in west Lampung Indonesia.

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Abstract. The traditional house of the people of West Lampung consists of 3 (three) main parts, namely the head, body, and legs. However, the current phenomenon is that the foot of the house or under the house has changed. These changes occur due to the development of the number of family members, affecting the increase in private space to living. This study uses a phenomenological method by looking at the phenomena in traditional houses inhabited by the Pekon Hujung community group. Data collection techniques are exploration and direct observation to the field including taking physical measurements of the room and the structure of traditional houses also the function of each room, particularly the space under the house (Kolong), depth interviews with who are considered to know about traditional house information, literature review as a research discussion variable as supporting data and documentation of the of traditional houses' structures as evidence of the correctness of data or information found in the field for further analysis. The result is discovering the addition of the room's function under the house into a new space that is mainly prioritized for rest and socializing informally.

1. Introduction

Traditional houses in Southeast Asia generally have characteristics, gable roofs, stilts and have ornaments. These traditional houses are categorized as Austronesian houses [1] or considered part of the Austronesian Malay family house [2]. The house on stilts cannot be separated from the existence of a particular climate and geographical area. The stage functions as a flow of air circulation [3], as a place to store tools, under the stilt houses name as Kolong in some houses are used as a place to store canoes and agricultural tools such as in Malay houses Riau. The place where animals are kept is like the Lum tribal house in Bangka Belitung [4], while the Tongkonan Toraja house also functions as Kolong for weaving [5].

In general, Kolong functions as an outdoor space used as an additional activity in the house on stilts. Altman and Chemers [6] say that the stilt house with the use of natural materials has a general picture, that one of them is related to the pit is that the existence of the pit in traditional houses can be used for raising livestock, storing agricultural tools, agricultural products, etc. While Budiharjo [7] in the tropical climate, many activities that can be done outdoors such as cooking, playing, even sleeping are sometimes more comfortable to do outdoors than indoors.
The **kolong** of this house, which was initially an additional space or a secondary activity carried out, shifted according to other needs needed. This function shift can be as part of adaptation or negotiation of space requirements. This paper will look at adding **kolong** space of the house as a form of shifting function and needs in the existence of traditional house functions in Pekon Hujung, West Lampung.

2. **Methods**

The research uses a phenomenological method by looking at the phenomena that occur today in traditional houses inhabited, with the results of the study will focus on the space under the house (**Kolong**). Data collection techniques are exploration and direct observation to the field, depth interviews, literature review, and documentation of the object. Exploration and direct observation is carried out by observe the object in detail and collect data by taking physical measurements of the structure of traditional houses and the function of each room, especially the space under the house (**Kolong**). Interviews were conducted with local communities as owners of houses in the observation area, customary officials, and village officials who are considered to know about traditional house information. Literature review as a research discussion variable as supporting data that supports the traditional Lampung house.

At the same time, documentation is in the form of video and voice recordings, photos, and detailed sketches of traditional houses’ structures as evidence of the correctness of data or information found in the field for further analysis.

The results of the data obtained in the field are then analysed. The data analysis process is carried out inductively by classifying the data based on the variables. Classification based on the size of the room, layout of the space, the function before and after the space under the house is transformed, that have been created from the results of observing and analysing traditional houses construction structures in the observed area.

3. **Results and discussion**

3.1. **Traditional house of Pekon Hujung**

Pekon Hujung is located in the Belalau sub-district, at the end of the West Lampung district. The Pekon Hujung community's houses are stilt houses that use wood as the primary material when the wood comes from the forest around the settlement. Cemara wood, Merbau wood, and Meranti wood are used as structures of the house; **Tenam** wood and bamboos are used for walls and floors, while for doors and windows using **Bayur** wood. There are five types of houses with 14 column grid patterns as a form of traditional house transformation in Pekon Hujung. The transformations that occur from the primary form of the house to a new form are influenced by the economic capacity of the homeowner and the capacity of the area of each house [8]. To fulfill the need for additional space, they use the space under the house (**kolong**) as a new additional space with the same function or new functions.

3.2 **The existence of Kolong in the traditional house of Pekon Hujung**

The height of **kolong** on stilt houses in the Pekon Hujung settlement varies. From 40 houses sampled, around 36 houses have 2.5 meters, three houses above 2 meters, and one below 1 meter. With this height, the **kolong** can be used as a space to carry out various additional activities for its residents. The presence of the **kolong** in the traditional house of the West Lampung community must always be there because, in principle, the Lampung traditional house is a symbol of the macro and microcosmos. As a symbol of the macro cosmos, the **kolong** represents the underworld, while as a symbol of the microcosmos, kolong represents the feet of humans [9].

West Lampung Traditional Houses can also be classified according to their spatial and vertical functions, which can be grouped into the following three sections; Hatok Nuwa, the roof of the house that used to be made of palm fiber and sago palm leaves, but as its development slowly turned into
tiles or zinc, but did not change the shape of the roof building as a whole; The Penaku Nuwa, the body of the building, is located between the floor and the attic of the room where people live. Divided into, living room, bedroom, dining room, and family room; Bah Nuwa, kolong of the house located at the bottom between the floor and the ground or the bottom of the stilt floor used to store agricultural tools and livestock.

![Image](image1.png)

Figure 1. The original form of the traditional house of West Lampung.

3.3. Transformation of the "Kolong" function as space requirement

The importance of the presence of kolong of the traditional house of the people of West Lampung becomes a must-have thing. It is not a complementary or supporting part but is the central part besides the body and roof of the house, but due to the growth and development of the family structure, the community needs a more expansive space to accommodate it and the needs of its residents. Therefore, one alternative is to develop the house towards the bottom or under. From the results of direct interviews, in general, the community has the exact reason they develop downwards or under, namely because it is cheaper, easier, and saves land.

Findings in the field indicate that the purpose of fencing carried out by the general public is to make the kolong space under the house a place to live or to move the function of the body of the house to the bottom/kolong due to the increase in the structure of family members, another reason underlying the addition of space under the house is the need for space for non-socializing like formal activities, service activities, and warehouses. In this case, most people still think that the kolong is still prioritized as a storage area for building materials and agricultural products. This is due to the relatively large size of the house so that it can still accommodate or accommodate the main activities of the occupants of the house.

![Image](image2.png)

Figure 2. Various activities take place under the house "Kolong".

At first, the function of kolong space under the traditional houses of the people of West Lampung was only to protect the community from wild animals, which at that time had a substantial population and threatened their safety; this is natural considering that in ancient times their residential area was still a forest. This stilt house system makes residential spaces on the second level, making people feel safer from the dangers of wild animals.
After the residential area became more crowded and the forest area less and less, the population of wild beasts decreased, making the kolong of the house completely useless. However, because the population of each family is increasing, which makes the need for new spaces increase, the community finally takes the initiative to transform the kolong space into new, more functional spaces.

| House Name | Figure | Function |
|------------|--------|----------|
| House number 7 | ![Fencing area](image) | Fencing kolong is carried out in the middle to the back. Its function is for servicing and storing goods. The front (under the pavilion) is added space such as a terrace used for non-formal socialization. |
| House number 14 | ![Fencing area](image) | Fencing kolong fenced in the middle to the back. Its function is to serve and rest. |
| House number 9 | ![Fencing area](image) | Fencing is carried out on the entire Kolong section. Its function is to serve, rest and receive guests. The front is added space such as a terrace for non-formal socialization. |
| House number 11 | ![Fencing area](image) | Fencing is carried out in all parts of Kolong. Its function is to park vehicles and warehouses. The front (under the upper pavilion) is added space such as a terrace for non-formal socialization. |
| House number 17 | ![Fencing area](image) | Kolong fencing is done from the middle to the back. Its function is for the service and storage of agricultural products. The center of the front is emptied so that it forms a terrace for non-formal socialization. |
| House number 24 | ![Fencing area](image) | Kolong fencing is done in the middle to the back. Its function is to serve and rest. |

**Table 1.** Shape features of nutmeg (pixels value ± standard deviation).
3.4. Morphological layout of the development of the Kolong space

As a result of the growth and development of the family structure, society requires a new space that is wider than before. For the expansion of the house (addition of space), the community needs land, but due to limited land in the Pekon Hujung area, the easiest and cheapest alternative is to do a fence in the Kolong area under the house to get new spaces. Fencing is carried out in several places according to its function; as for the description, it can be seen in the following pictures.

Type 1 is covering the area behind the pit for the function of ditches and cattle pens. Type 2 is covering the back area under the service room function. Type 3 is covering all parts of the under area for service activities and restrooms. Type 4 is close the entire area under for servicing, resting/sleeping, and receiving guests. Type 5 moves family residential activities to under the house and adds a non-formal socialization space on a terrace. Type 6 is moving family residential activities to under the house and non-formal socialization in terraces and stalls.

Figure 3. Stage 1 and 2 development.

Figure 4. Stage 3 and 4 development.
After developing the space downwards, kolong space transformed into new spaces that can be used as a warehouse for storing crops, building materials, living rooms, and cattle pens.

**Figure 5.** Stage 5 and 6 development.

*Kolong*, as a semi-public space, is very conducive for its residents to carry out various activities. Because of the positive side of *kolong*, people in Pekon Hujung still feel at home does activities in that space. From the field study results, it can be seen that most of the female occupants of the house are in *kolong* the house after the household chores are completed. Usually during the day that starts from 10 am to 4 pm.

The development stage of the house towards the bottom is adjusted to the needs and abilities of the owner's house. The data above shows that the priority of house development towards the bottom is for private space and storage and service areas. This is done because of the safety factor and the ease of taking clean water from the well into the house. Residents of the house feel safer and more manageable when placing the service room (kitchen and sanitary) at the bottom of the house because when placed on the top floor, they must use stairs which are sometimes slippery and require energy to access.

| Room Name             | Activity          | Position | Characteristic |
|-----------------------|-------------------|----------|----------------|
| Kolong                | Workspace         | Front    | Semi-Public    |
| Socialization room    | Front             | Public   |
| Warehouse             | Middle back       | Private  |
| Cattle pen            | Back              | Private  |
| Cook and wash         | Back              | Private  |
| Eat                   | Middle            | Private  |
| Toilet and bath       | Back              | Private  |

4. Conclusions

The stilt houses for the people of Pekon Hujung have a very positive impact in various aspects, both in terms of comfort, spaciousness, and ease of controlling the surrounding environment. In addition, the development of the house downwards adds to the function of the space under the negative space into a positive space. In the case that occurred in Pekon Hujung, the addition of these functions was prioritized for private areas, service areas, and storage warehouses, but not infrequently, additional
functions were also carried out to add additional space such as cattle pens and stalls. From the data that has been obtained, it can be concluded that; The majority of about 98% of the 40 sample houses did fencing under their houses; From about 40 samples of houses that we took, the new functions found in the space under areas rooms, warehouses for storage of building materials and storage of agricultural products, living rooms, family rooms, food stalls, and service areas; The majority of about 85% of the 40 sample houses did house fencing in all sections under, the rest did fencing from the middle to the back; About 80% of the tile under the house is cement, followed by 15% ceramic tile and 5% soil.

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