



11th ABRA International Conference on Environment-Behaviour Studies

Semiramis Hotel, Marrakech, Morocco, 01-07 Mar 2023

Provision of Post-flood Housing Reconstruction in Kuala Krai, Kelantan vs. Local Housing Practices

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Abstract

In post-disaster housing reconstruction (PDHR), local values have been disregarded, causing difficulties in the community's daily lives. This research aimed to assess the physical attributes of PDHR in Kuala Krai Kelantan against pre-flood traditional values and to analyze their response toward these values. This analysis employed a case study method involving 36 Kampung Manek Urai Lama respondents. Findings discovered that crucial local housing attributes were not considered in the PDHR, resulting in culturally incompatible houses. The result of this study shall be a learning tool to facilitate improvement for future PDHR in Malaysia.

Keywords: housing reconstruction; post-disaster impact; housing evaluation; Kuala Krai

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DOI: <https://doi.org/10.21834/ebpj.v8i23.4492>

1.0 Introduction

Disasters cause a wide range of consequences and distress to the community, many of which have a more devastating effect when it is beyond the capability of coping. It is especially critical in developing countries because the consequences are more significant than in developed countries, affecting more people in rural areas (Barakat, 2003). In addition to human deaths, the most apparent effect of a disaster is the destruction of homes. Losing a house is undeniably upsetting, as houses are considered the most valuable asset and a lifetime investment. Hence in these areas, survivors have a high dependency on external support for post-disaster recovery.

UNISDR defines disaster recovery as restoring and improving facilities, living conditions, and livelihood and reducing disaster risk factors (UNISDR, 2009). Along this line, post-disaster recovery should be prioritized by all actors related to PDHR (Few et al., 2021; Finucane et al., 2020). This recovery entails the reconstruction of permanent post-disaster housing for the affected community, which must be responsive to local climate and culture, durable, easily maintained, adaptable for future living, and developed with the beneficiaries' participation (da Silva, 2010). While poorly constructed houses have been destroyed in the disaster, the reconstruction

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DOI: <https://doi.org/10.21834/ebpj.v8i23.4492>

process provides an opportunity to rebuild them better and safer (Ahmed & Charlesworth, 2015). Moreover, the cultural status of the impacted community influences the survivors' capacity to manage the predicament.

Research has emphasized that any post-disaster housing reconstruction (PDHR) projects must be built to fulfill the needs of the affected community. Hence housing strategy should consider cultural values, social needs, and natural features with long-term recovery (Tas et al., 2007). Frequently, the PDHR process focuses on tangible and numerable components of reconstruction, namely the number of houses built and total donations, as well as technological viewpoints and scientific approaches to housing quality (Oo, 2018). An equally important concern is the significance of living traditions and culture in the housing reconstruction process. PDHR, which disregards indigenous knowledge and local traditions, has been an issue since the earliest studies. It is especially prevalent in rural areas where distinct local customs or cultures remain intact (Lu & Qian, 2023). Evidence revealed that the affected community could no longer resume their customs and tradition in the newly donated houses, resulting in difficulties in their daily lives. Investigating the condition of post-disaster housing and occupants' perspectives on these regards could illustrate whether the housing project supported the post-disaster recovery or whether more assistance is required (Arlikatti & Andrew, 2012). Understanding the users' spatial needs is a crucial first step in producing practical and effective homes (Agyefi-Mensah et al., 2020).

In the case of Kuala Krai, how can we know that these housing provisions have addressed the residents' basic needs? How can we determine whether the house parallels local housing practices regarding its cultural appropriateness, values, and traditions? This outcome remains uncovered even though evidence highlighted the importance of determining how the housing reconstruction has contributed to community recovery after it was delivered.

This research seeks to gain insights into PDHR and local housing practices in a village in Kuala Krai district, Kelantan, one of the hardest-hit areas in the unfortunate 2014 flood in Malaysia. It intended to explore the beneficiaries' experience living in the reconstructed houses by understanding their spatial requirement for pre-flood housing practices and traditions. The objectives of this study are twofold: firstly, to assess the physical attributes of the house against their pre-flood traditional values. Meanwhile, the second objective is to analyze their response toward any changes or continuity of these values while living in the house. Evaluating the spatial provision of PDHR in tandem with their traditional living values will reveal whether these values transformed or persisted from pre-flood to the present. This research argues that assessing beneficiaries' experience living in donated houses could provide an understanding of the importance of incorporating traditional values into the housing reconstruction process.

2.0 The Role of Traditions and Culture in Post-Disaster Housing

A house manifests its occupants' needs and aspirations, especially in areas where the house is built following the users' daily activities. Housing quality directly relates to how well it accommodates its occupants' social, cultural, and behavioral needs. In Malaysia, traditional houses are built to meet the social and cultural needs of the community (Azman et al., 2022). Factors such as lifestyle, customs, traditions, and family structures are among the considerations that influence the spatial organization of a house (Ahmad Suryadi et al., 2022). Although houses may undergo a considerable transformation, the implicit influence of cultural values persists in the spatial organization (Seo et al., 2022).

Constructing houses in the aftermath of a disaster is often coupled with more significant challenges than typical construction; however, PDHR offers an opportunity to rebuild disaster-stricken areas into a better environment (Jayakody et al., 2022). While numerous guidelines and construction approaches were published in the PDHR process, there is no guarantee that they will be implemented in the reconstruction projects (Ridzuan et al., 2022). Due to various reasons, most government and humanitarian agencies would impose standard housing models based on their perceptions of what people require (Barakat, 2003)

Scholars have documented the significance of integrating social and cultural elements into post-disaster housing reconstruction. Rapoport (1969) argues that these elements should be given priority in any housing environment. Reconstruction of post-disaster housing involves not only providing them with a place to live, but a more significant concern lies within the occupants by which their living tradition, cultural, social, and spatial needs, should be duly integrated into the design of the PDHR (Su & Le Dé, 2020). Disregarding these needs leads to more significant negative consequences, which would impede post-disaster recovery and cause an adverse condition in the long run.

Traditionally, people in rural areas are involved directly in building their houses. In post-disaster settings, studies have demonstrated that these people can also develop houses more tailored to their specific needs, especially if given adequate technical and financial support (J. D. Barenstein, 2006). According to Ahmed (2011), an insufficient understanding of local housing needs resulted in incompatible cultural PDHR, evident in the houses' size, layout, style, exterior space, choice of building materials, and infrastructure services. Failure to adapt to local needs and climatic conditions also leads to difficulty in maintaining or upgrading the house.

Studies evaluating post-tsunami housing reconstruction in Aceh found that donated dwellings needed adequate size and space, causing daily issues for the occupants. The donated houses did not consider Acehnese housing practices' philosophy of privacy, the hierarchy of spaces, and social activities. The absence and insufficient spaces resulted in altering their living traditions. The dissatisfied occupants had to modify their houses to satisfy their sociocultural needs, which the housing agencies (Rahmayati, 2016).

Preserving the pre-disaster housing environment is integral, particularly in locations with solid housing cultures, such as coastal Tamil Nadu, India. Their housing is a ritualized social event with deep ties to the community's livelihoods and social stability. However, the housing donors and actors deliberately overlooked the sociocultural and environmental context, which deprived the community's history, dignity, and cultural identity (J. D. Barenstein & Pittet, 2012).

In a unique community with a mixture of diverse religious beliefs, cultural attributes should be appropriately prioritized to increase the community's satisfaction, which would contribute to PDHR's success. In Sri Lankan context, these cultural attributes were

transformed and transferred across generations that, when it was not considered in the PDHR projects, had negatively affected their daily lives (Siriwardhana et al., 2021). The locals initially accepted the house's design sample. However, it became the opposite during the occupancy period (Capell & Ahmed, 2021).

The primary literature demonstrated the importance of integrating sociocultural factors, including traditions and cultures, into the design and planning of PDHR. The lack of consideration for cultural continuity is a crucial factor contributing to disaster vulnerability

3.0 Methodology

This research adopted a qualitative method involving case study approach located in Kampung Manik Urai Lama, Kuala Krai, one of the hardest-hit areas during the 2014 flood. For homogeneity in sample selection, this study focused on recipients of houses by the Federal Government and managed by Public Works Department (JKR). This led to the adoption of the purposive sampling technique. However, the exact locations of houses were undetermined as houses were scattered across the village. Therefore, this study adopted a supplementary sampling technique, the snowball sampling technique. First, the researchers were introduced to the village representative. After building rapport, he introduced the researchers to other housing recipients.

Thirty-six participants agreed to be interviewed. Open-ended interviews focused on the respondent's feelings, thoughts, and experiences related to the pre-flood, flood, and post-flood conditions. Participants and direct observation were also carried out to support the sociocultural findings. This research utilized thematic analysis to capture important subjects and emerging themes. This research utilized thematic analysis to capture important subjects and emerging themes from the interview transcripts to analyze the meanings of their actions and experience.

4.0 Overview of Post-flood Housing Reconstruction Kuala Krai, Kelantan

In December 2014, a monsoon flood devastated Malaysia, forcing more than 230,000 people to evacuate and leaving 17 dead across the country (IFRC, 2015). Kelantan was one of the worst-affected states in what has been called the worst flood within 100 years (Wan Ahmad & Abdurahman, 2015). The flood swept across nine out of ten districts in Kelantan, making Kuala Krai the most critically affected district, destroying houses, road systems, bridges, and railway tracks.

The destruction of houses significantly affected the villagers. According to National Disaster Management Agency (NADMA), approximately 1300 houses have been built progressively throughout Kuala Krai, which was a notable accomplishment in terms of quantity. This study focused on the New Permanent House scheme (RKB) funded by Federal Government built in Kampung Manik Urai Lama, Kuala Krai. There were 48 houses constructed with reinforced concrete frames and brick walls, supplied with individual electricity, water supply, and sanitary system.

This housing program offered two types of houses for the beneficiaries to choose from, which will be termed RKB1 and RKB2, respectively. RKB1 was a one-story house built on stilts and raised approximately 2.4 meters above the ground. The floor area was 62 meter² (667 feet²) and consisted of a living and dining area, three bedrooms, one kitchen, one bathroom, and one toilet, as depicted in its floor plan in Figure 1. Figure 2 illustrates the overall design of RKB1.



Fig. 1: Floor plan of RKB1
(Source: Hanafi et al., 2021)



Fig. 2: The overall design of RKB1

(Source: Author)

RKB2 was a one-story house built on the ground with a 76 m² (818 ft²) floor area comprised of a living and dining area, three bedrooms, one kitchen, and two toilets (Figure 3). The overall design of RKB2 is illustrated in Figure 4.



Fig. 3 : Floor plan of RKB2
(Source: Hanafi et al., 2021)



Fig. 4: The overall design of RKB1
(Source: Author)

4.1 Physical Characteristics and Housing Tradition

Before the disaster, this village depicts a typical traditional Malay village in Kelantan, where houses were randomly distributed and blended harmoniously with the compounds and pathways. The traditional Malay house (TMH) in villages expresses the vernacular characteristics of Malay architecture, designed and built appropriately to respond to their daily activities, actual needs, culture, climate, and environment (Ahmad et al., 2022). Its layout allows for the best combination of space and function, as all rooms are of a specified size and design depending on their designated functions. The primary construction material is timber, which is locally sourced and entirely built by the locals. Technological influence, urbanization, and modernization have resulted in the decline of TMH in Kelantan (Abdullah, Wahid, Khalil, et al., 2022). However, they remain the typical type of house in rural areas, including Kuala Krai, the study area.

Traditionally, Malay families live within the same village and adjacent to each other because of close family relationships. In particular circumstances, extended families would also reside under one roof; therefore, houses are extended to meet household needs. Most Malay houses are also built with a sophisticated system for future expansion. This system provides the advantage of extending the house gradually to accommodate the growing needs of the family or financial restrictions (Lim, 1984). Before the flood, most villagers had quite sizable homes that had been steadily expanded over the years to fit the rising demands of the households, such as married children or grandchildren. Most of RKB1's occupants stated that they deliberately chose the house type to enclose the empty area beneath it to gain more space for the family.

Meanwhile, those in RKB2 generally chose it for its more extensive floor areas, as they did not plan to expand the house. Although they were allowed to renovate the house, many could not afford it. These findings demonstrated that the floor area was the primary consideration in choosing the house type. In most cases, the size of the donated house was unable to fulfill household size, particularly the extended families. Those requiring extra space have thought about adding more rooms even before construction. Studies highlighted that household size is the most important criterion when planning post-disaster housing, especially in underprivileged communities (Barakat, 2003). Unfortunately, this criterion was not considered in PDHR in Kuala Krai.

One of the distinct design features of TMH is the stilts that elevate the floors from the ground level, creating a space underneath the house called *kolong*. Environmentally it acts as passive cooling that allows wind to pass through the floor planks and regulate the indoor temperature (Mohd Sahabuddin & Gonzalez-Longo, 2015). *Kolong* serves as a multi-purpose area depending on the household, including gathering between neighbors and families, working, repairing, storing, and drying clothes on rainy days. In RKB1, occupants constructed walls to enclose this space to gain more room for the family. Figures 5 (a) and (b) below show examples of modification in RKB1.



(a) (b)

Fig. 5: (a) and (b) Examples of modification in RKB1
(Source: Author)

In Malay houses, space configurations were influenced mainly by living traditions and norms. The occupants or male guests will enter the house through the covered porch or *anjung*, which generally would face the house compound. Guests are also served in this area; therefore, it acts as a transitional space between the public and private zones. The design of RKB1 allocated a transitional space before the entrance door, but the space needs to be more significant to function as an *anjung*. In RKB2, a modest roof was provided at the entrance door; however, it is ineffective to protect from rain. Observation revealed that occupants in RKB2 had constructed an additional roof at the front part of the house, adequate to protect from the weather, as shown in Figure 6. Seats were provided at the new porch area to entertain guests and interact with neighbors. In non-renovated RKB2, seats were also provided, indicating that the essence of *anjung* persisted, even without physical structure.



Fig. 6: New porch constructed in RKB2
(Source: Author)

Home-based enterprises, particularly in Kelantan, were historically centered on local trades and guilds (Abdullah, Wahid, Titisari, et al., 2022). People have been known to allocate space or build shops adjacent to their houses. This study discovered that houses are also becoming a venue for commercial activity, as they were constructed to accommodate economic means and the demands of users who work at home, such as tailors and babysitters. Even stalls and eateries are built attached to the house.



Fig. 7: Example of kitchen extension
(Source: Author)

Women in this study were particularly concerned about the insufficient kitchen areas in RKB1 and inefficient circulation in the donated houses, hesitantly adjusting their activities and pre-flood practices to suit the current house. In Malay practices, female guests usually would be welcomed from the kitchen entrance to the rear section of the house, which is a restricted area and allocated mainly for women. The original house was built with only one door at the front of the house, making circulation for women could be more efficient. Findings revealed that most RKB1 had extended the kitchen area and built additional doors in the rear section of the house, as depicted in Figure 7.

The toilet and bathroom are also built in the rear section and are still separated in some traditional Malay households, especially those in Kelantan, for hygienic and religious reasons. Although having a separate toilet and bathroom was not required in Islam, they believed it was vital because the bathroom was mainly used for cleansing oneself, washing clothes, and performing ablution or *wudhu'*, an act of ritual cleansing before completing prayers. This feature has been included in the RKB1 housing scheme, but in a larger household, the occupants had constructed an extra bathroom on the ground floor for *wudhu'* and washing clothes by hand. The analysis revealed the significance of daily activities, spatial needs, and spatial relationships in their housing practices, with high regard for privacy, intimacy, tradition, and functional factors.

5.0 Conclusions & Recommendations

Findings discovered that the community has attempted to restore their pre-flood traditions. Initially, they would preserve the essence of their traditions by adapting to the donated house's limitations until they can modify the house according to their actual needs. This indicated the continuity of pre-flood local traditions into post-flood living conditions. The catastrophic events may destroy the built form of the house, but the traditional values that initially may destroy the built form of the house, but the traditional values that initially shaped the community and their houses tend to persist. These signified that the values were disregarded when planning for PDHR in Kuala Krai, which ended up with culturally incompatible houses, leaving sustainability and recovery in question. Housing evaluation from community's perspective is crucial to determine the project success, understand the positive and negative impacts on housing occupants; and identify the components that could be improved.

This study examines how people experience their housing culture and lifestyles in donated houses. Further studies are needed to evaluate PDHR programs at different periods and involve other stakeholders in PDHR since post-disaster studies are complex and tend to differ within housing types, locations, and time.

Acknowledgements

The authors wish to extend appreciation for the support and funding provided by Universiti Malaysia Kelantan (UMK) for this project under UMK-FUND Grant No. R/FUND/A1200/01738A/001/2020/00752.

Paper Contribution to Related Field of Study

This study demonstrated the importance of evaluating these values during occupancy stages in PDHR and offers an excellent opportunity to recognize the actual condition of the PDHR, whether the housing assistance has supported disaster recovery or impeded it. The result of this study shall be a learning tool for post-disaster management and reconstruction to facilitate improvement for future PDHR in Malaysia.

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