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# Temporary Home in Transit Time: Architecture Responses to Post-Flood Disaster in Malaysia

By:

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A thesis submitted in fulfilment of the  
requirements for the degree of Doctor of Philosophy

The University of Sheffield  
Faculty of Social Sciences  
School of Architecture (SSoA)



22<sup>nd</sup> August 2020



Temporary home in transit time:  
Architecture responses to post-flood disaster in Malaysia

Supervised by:  
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*In memory of my late father, Tukiman Kalam (1950-2014), who throughout his lifetime etched in the walls of my heart the importance of education. I love you, Ayah.*



I wish to express my sincere gratitude to my main supervisor, Professor Renata Tyszczyk, for her continuous support of my Ph.d and related research, for her motivation, encouragement, immense knowledge and prowess. Similarly to Dr. Beatrice de Carli, my second supervisor, for her valuable expertise and insightful comments. Their guidance helped me in all the time of research and writing of this thesis. I could not have imagined having better advisors and mentors for my Ph.D study.

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Nor Izura Tukiman.

22<sup>nd</sup> August 2020.



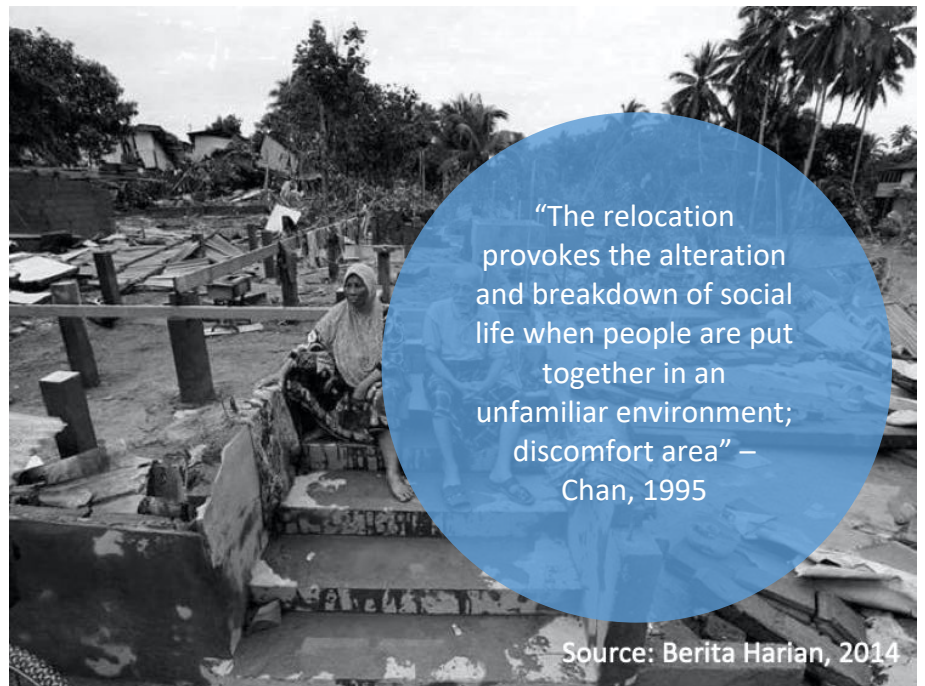


# Prologue

1. The study begins by questioning the aspect of architectural practice within disaster response



2. Relocation becomes one of the main issues within post disaster which demands scrutiny within architectural practice.





3.  
Fieldworks; Case studies  
in Malaysia



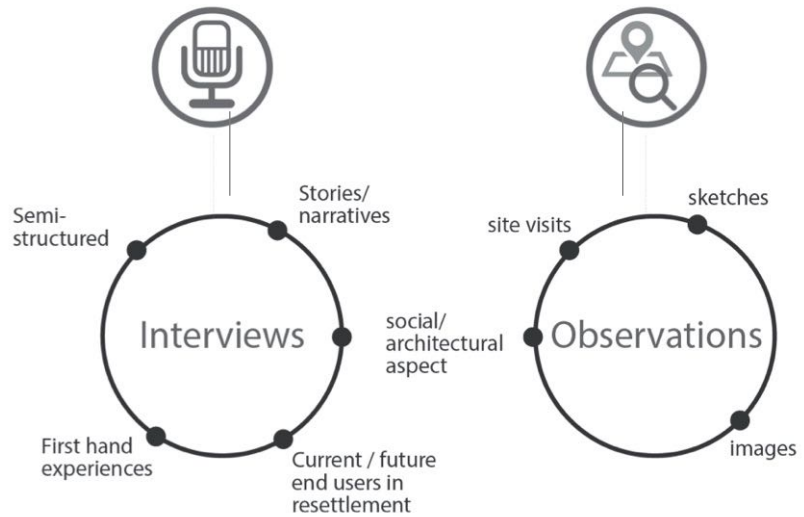
4.  
2006/07 floods in 3  
states including Kota  
Tinggi, Johor;  
Resettlement



5.  
2014 flood in 4 states  
including Kuala Krai,  
Kelantan; Temporary  
Relocation

Source: Astro Awani, 2014

6. Qualitative research methodology is adopted throughout the studies where Interviews and observations were central to fact finding.



Hafiz Amirrul  
Architect / Urban Designer/  
Philanthropist

Saiful Tajudin  
Architect / Developer

Razib Basiron  
Architect / Urban Designer/  
Philanthropist

Hazazi Hamzah  
Architect / Artists

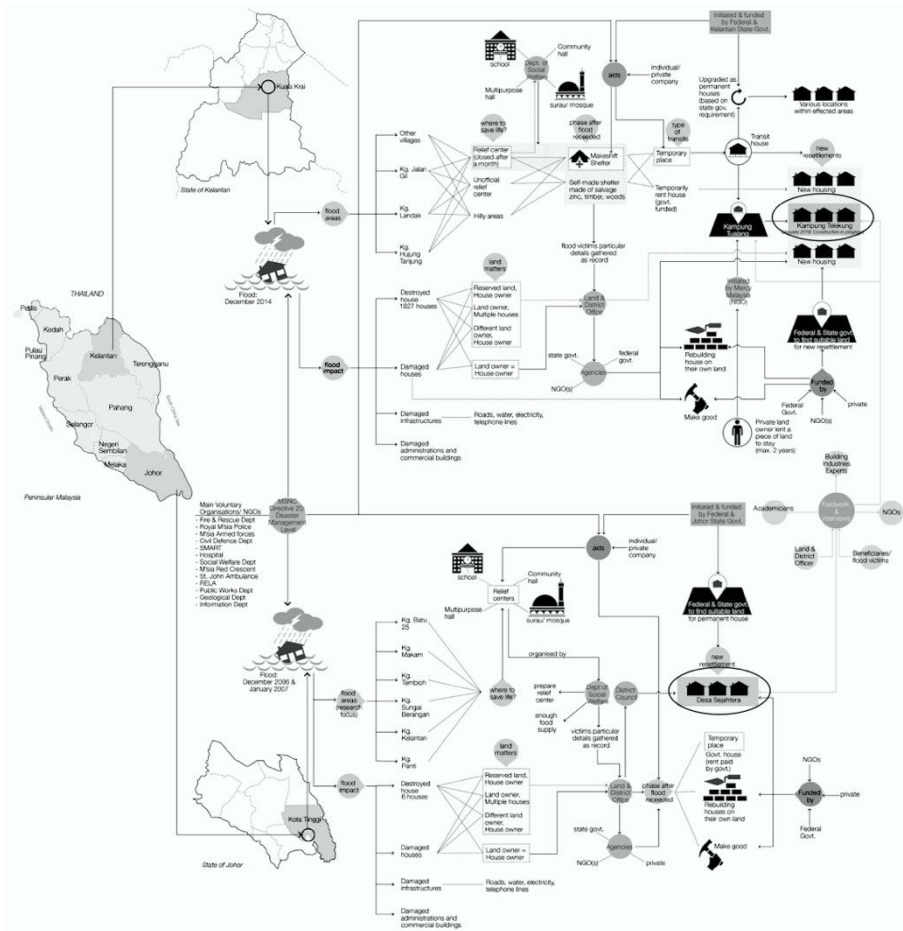


7. Focus group and workshop were conducted to gain insights into the minds of stakeholders - particularly the architects/designers.

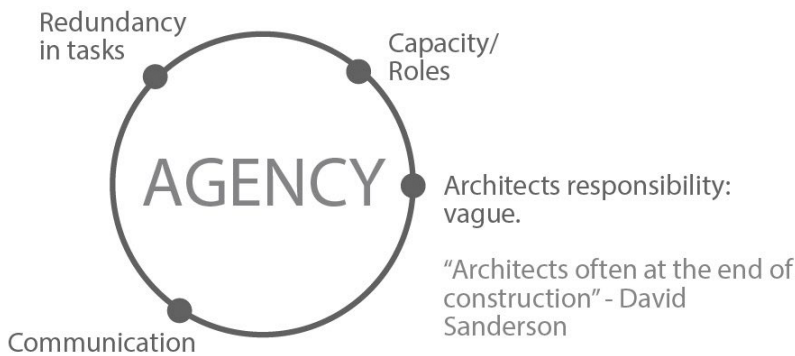
8. The questions that is often raised during the fact-finding mission.

What is the role and relevance of **architects** in post disaster situation?

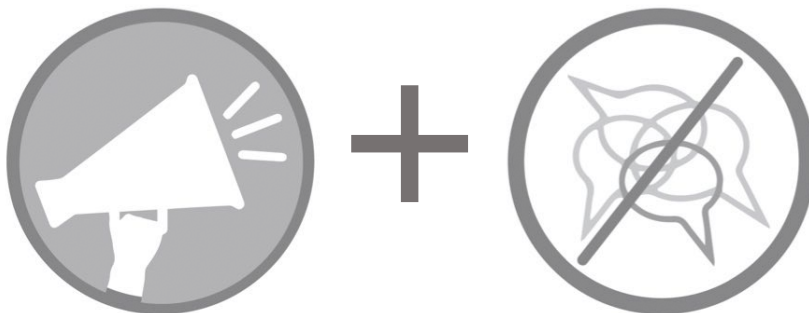
Where **architects** were and should be within post-flood disaster process?



9. Research mapping creates a visual journey into the breath of information within post disaster response between two case studies. The findings were extracted from the interdependences of actions of stakeholders.

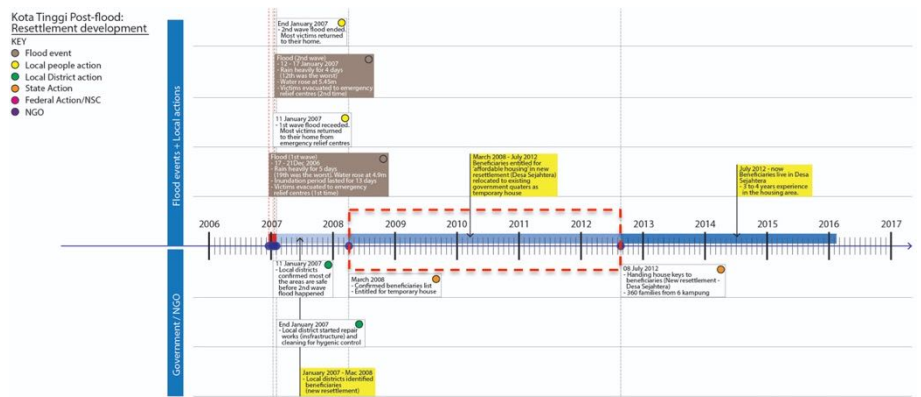
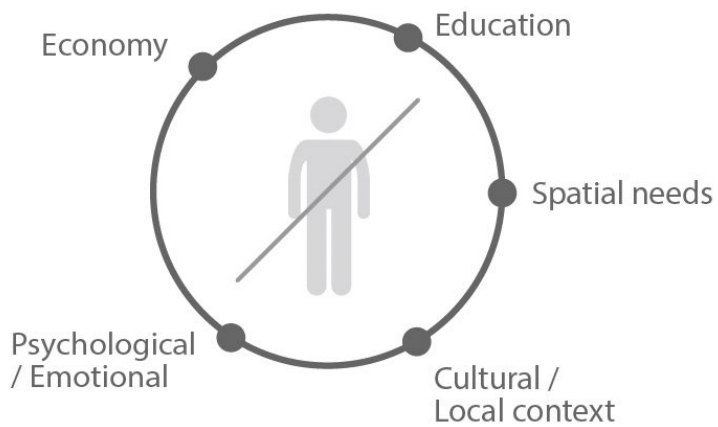


10. Inefficient coordination among agencies, including built environment professionals

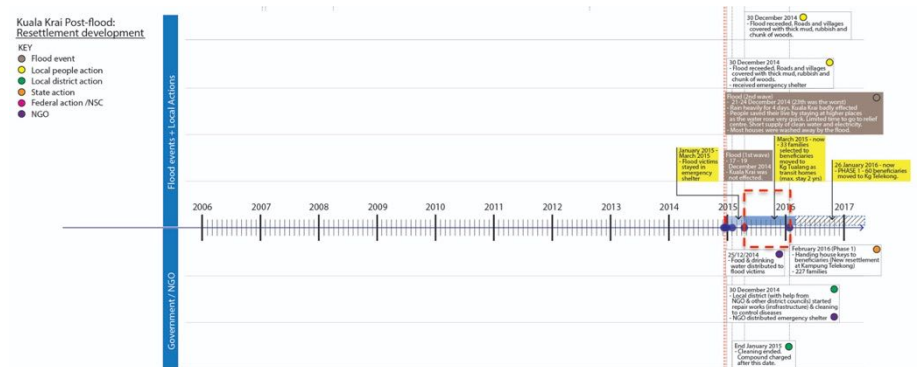


11. Lack of community engagement during design process and centrally controlled (top-down approach), turning this community into helpless passive recipients of relief

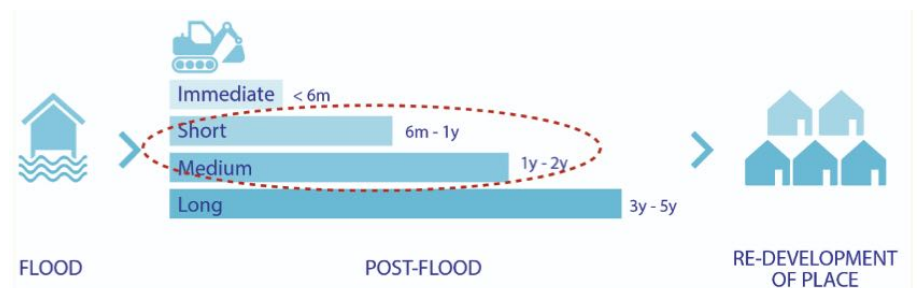
12. Disaster affected community were seen as underprivileged segments of society undertaken as low cost community with low quality construction



13. Mapping as a way to understand the resettlement development of Kota Tinggi post-flood event, as well as, temporary home in transitional period in Kuala Krai.



14. The transit period is not utilized or exploited by Architects to engage, learn and develop post-flood reconstruction outcomes



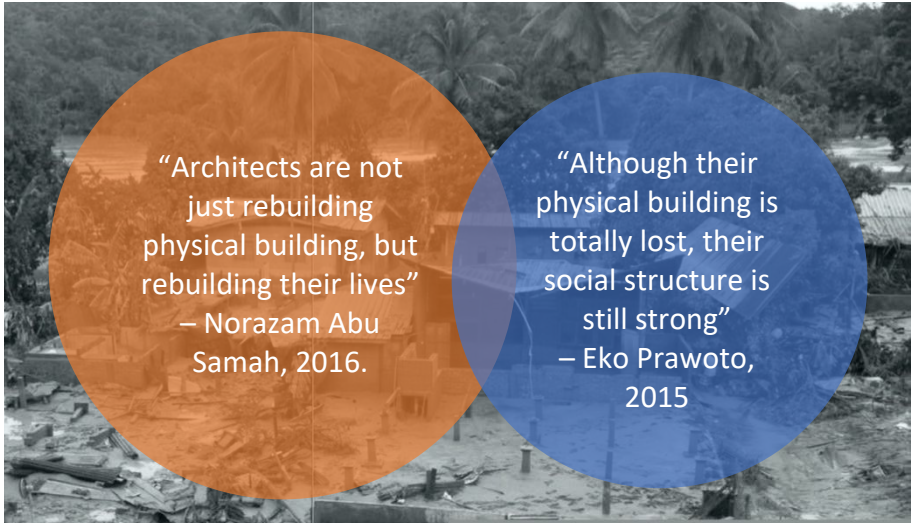
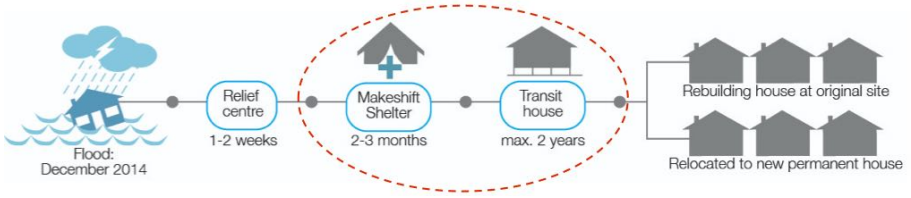


Image source: Mercy Malaysia, 2014



15. Negotiating the role of architects within post disaster?

Treating users or flood-affected communities as subjects rather than objects

16. The transit periods were an opportunity for the study to understand the rebuilding process that happened and reflect how architects can engage, learn and develop a better post-flood rebuilding process and resettlement outcome, together with the locals.

17. Transit home as a ground for exploration, experimentation and design research.

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# Abstract

Climate change is considered urgent and important but at the same time widely seen as boring, difficult and confusing. Climate change is not simply the concern of science; it is a matter of living. In one of his speeches in 2014, Sir David King highlighted that, 'Climate change is not the biggest challenge of our time, it's the biggest challenge of all time.' Since the establishment of the Intergovernmental Panel on Climate Change (IPCC) in 1988, the series of assessment reports published on climate change has influenced the actions and responses of societies to these issues. Nonetheless, the thought of future societies coexisting with the consequences of climate change remains complicated, uncertain, and disconnected from the public in the present day.

This study has attempted to bring the global climate change issue into dialogue with the more intimate and immediate concerns of the local population in Malaysia, with reference to two neighbourhoods at constant risk of flooding: Kota Tinggi in Johor and Kuala Krai in Kelantan. The study identifies flood as one of the frequent threats of climate change in Malaysia that is often taken for granted. The study focuses on the impacts of major seasonal or monsoon flooding that has subsequently resulted in unexpected and involuntary displacement and relocation of communities. Prior to this study, limited research had been done on the issue of flood displacement and relocation in the Malaysian context, particularly during the transitional period. Moreover, post-flood disaster solutions often neglect the characteristics of place concerning site, culture and climate, and the importance of this in creating a sense of home for relocated communities.

Therefore, the study attempts to understand the post-flood disaster scenarios through the narratives of flood-affected people and architects, specifically in relation to temporary homes. The study adopted the 'fieldwork' methodology in relation to two case studies, the settlements affected by flood disasters in Kota Tinggi and Kuala Krai. This fieldwork included conducting interviews and workshop sessions, gathering documentary evidence and creating mappings. Kota Tinggi was consecutively affected by flooding in December 2006 and January 2007; it thus, represents a past narrative of disaster response and resettlement. However, as a result of the unexpected flooding in Kuala Krai during the first phase of fieldwork conducted in December 2014, the framework of the study was reoriented to include aspects of post-flood narratives during the transitional period between disaster and resettlement. This unforeseen disaster presented an opportunity to observe and experience first-hand post-disaster conditions in real-time.

The study presents the argument that global climate change issues have the tendency to obscure and complicate the reality within local contexts such as Malaysia. Hence, the international dialogue should embrace the narratives of native people through evidence gathered from fieldwork, and discussions with local architects. Conversely, the local post-flood disaster discourse should understand and assimilate the international issues in order to face the future of climate change impacts.

The study suggests that the transitional period concerning relocation and temporary homes is critical but often neglected. Termed as 'transit time', the period is essential for architects to evaluate and respond to how post-flood disaster situations are being challenged, adjusted and adapted to through time and space by the local inhabitants. The outcome of this study discusses the relevance of the architect's role during and after the post-flood disaster resettlement.

The study postulates that the period of 'transit time' is not only an architectural undertaking, rather it relates to the social aspects in the process of rejuvenating community trust, participation and empowerment. Therefore, architecture is considered merely a medium that reconnects both physical and social structures lost during the disaster. Hence 'transit time' provides the platform for architects to reconsider local communities' cultural needs, present skill sets and existing environment in order to achieve relevant architectural adaptations; specifically, in terms of resettlement and also in facing the global climate change impact, more generally.

Ultimately, the study presents the importance of transit time not only as a framework for assisting the relocation of flood affected people but also in providing them with a conducive temporary home.

Keywords:

Climate change, Flood, Post-disaster, Transit time, Transit Home, Resettlement, Architects

# Chapter One

## Temporary Home in Transit Time: Architecture Responses to Post-Flood Disaster in Malaysia

### 1.0 Introduction

Climate change has long been debated globally. It is considered 'urgent and important and at the same time is widely seen as boring, difficult and confusing' (Smith et al., 2014). Climate change is not entirely an issue of science; however, it is also a matter of living. In one of his speeches in April 2014, Sir David King<sup>1</sup> highlighted that, 'Climate change is not - in the Foreign Secretary's words, the biggest challenge of our time, it's the biggest challenge of all time' facing humanity (Murray, 2014). The German Chancellor, Angela Merkel<sup>2</sup> also highlighted this during her speech at the United Nations Climate Change Conference of the Parties (COP23) in Bonn in November 2017, as she referred to the climate change as a 'key challenge for humanity' (Merkel, 2017). She stated that, 'Climate change will determine the fate of our world. It will determine the wellbeing of us all' (Merkel, 2017).

In May 2017, before the COP23 in Bonn, Antonio Guterres, the UN Secretary-General, in his official statement highlighted the pressures faced by societies that are being worsened by megatrends; especially climate change. Climate change was described as, 'an unprecedented and growing threat,' (UN News, 2017a) and he proclaimed that, 'Climate change is a direct threat in itself and a multiplier of many other threats - from poverty to displacement to conflict' (UN News, 2017b). During COP23 in Bonn, the French President, Emmanuel Macron, called attention to the same issue as he informed that, 'Climate effects have been multiplied and are becoming ever more intense' (BusinessGreen, 2017). He brought to the fore the importance of tackling climate change globally

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<sup>1</sup> Sir David Anthony King is an Emeritus Professor in Physical Chemistry at the University of Cambridge. He previously served as the Foreign Secretary's Special Representative for Climate Change and Chief Scientific Adviser to the UK Government. He initiated and led the foresight programme that looks at long-term issues such as flooding and was instrumental in advising the UK government and raising public awareness of the subject of climate change, and hence was a strong supporter of IPCC.

<sup>2</sup> Angela Dorothea Merkel is one of the most powerful women, serving as Chancellor of Germany since 2005 and described as the de facto leader of the European Union.

by highlighting the impacts of warming oceans and vanishing species especially on vulnerable communities.

The World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) have set up two secretariats in relation to climate change. The first is the Intergovernmental Panel on Climate Change (IPCC). Established in 1988, the IPCC is responsible for the review and recommendations on the scientific knowledge of climate change, the impact towards social or economic conditions, as well as the strategies for possible future climate convention.

The establishment of the IPCC and its scientific evidence in the First Assessment Report in 1990 underlined, 'the importance of climate change as a challenge requiring international cooperation to tackle its consequences' (IPCC, 2018a). This led to the creation of the second secretariat known as the United Nations Framework Convention on Climate Change (UNFCCC) in December 1990. The UNFCCC is the, 'key treaty to reduce global warming and cope with the consequences of climate change' (IPCC, 2018a). Its responsibility comprises of making arrangements on conventions, assisting organisations in implementing their environmental commitments, providing support to on-going negotiations and also coordination with other relevant international bodies.

Since 1988, the IPCC has been producing comprehensive scientific assessments on climate change and its socio-economic impacts. At the time of writing this thesis, the IPCC has so far produced five assessment reports; the first was in 1990, then in 1995, 2001, 2007 and 2014. The IPCC is currently in its sixth assessment cycle with the final synthesis report due in 2022. The assessment reports are the result of input from hundreds of authors, which draw on the work from thousands of contributing authors and expert reviewers worldwide (IPCC, 2018b; Schulte-Uebbing et al., 2015). As a result, the series of reports have influenced climate change global action and responses, and they are considered a significant reference for policymakers and specialists (Figure 1.1).

The outcome of the research conducted by the IPCC and UNFCCC has shown that climate change in the near future will continue to become apparent and at an unprecedented rate in many parts of the world. The risks associated with climate change are real, but future scenarios remain uncertain in terms of time and scale. Although climate change is a global

issue, the experiences will not be the same across the world. The extent and rate of climate change impact varies between continents and regions, however the changes in climate may threatens the basic human needs such as shelter, food, health and water. This is due to increased temperature, increased precipitation and more frequent extreme events - resulting in unprecedented scenarios and disasters that people cannot imagine including heatwaves, rising sea levels, severe drought and major floods (MNRE, 2015). These global impacts are categorized into three types of systems by the IPCC in its AR5-WG1; which are the physical systems, biological systems, and human and managed systems (Figure 1.2).

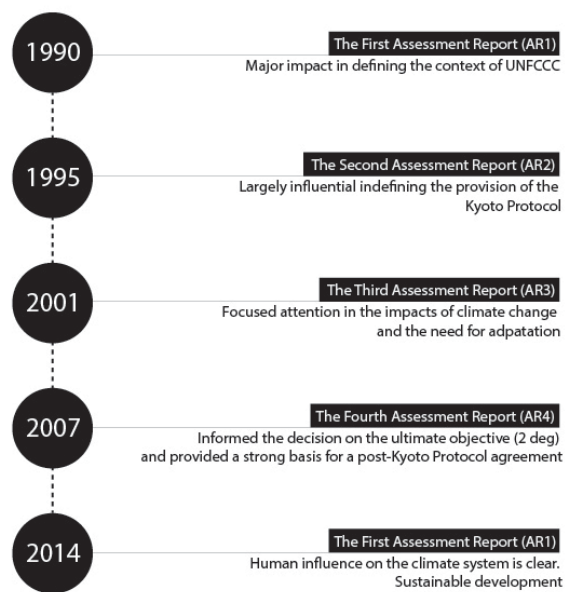


Figure 1.1 Timeline of the IPCC assessment reports being produced, the intentions and global impacts

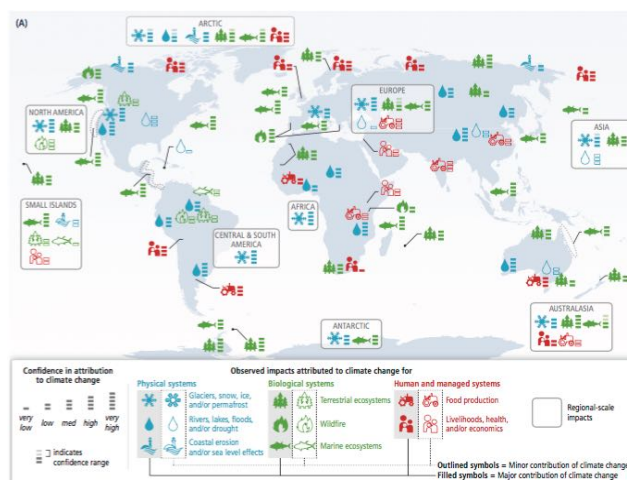


Figure 1.2 Observed impacts attributed to climate change for 1) physical systems 2) biological systems 3) human and managed systems (Source: IPCC, 2014)

Living the future with climate change is often thought as complicated and uncertain. The idea of climate change is discussed as a global agenda, but the information is too complex to be understood fully and it is hardly discussed locally in order for communities to respond within their own 'backyards' (Sheppard et al., 2011). Most of the world's population now live in cities or towns seldom observing or paying attention to gradual changes in their natural environment, particularly in environments less controlled by humans (Sheppard, 2011).

Climate change is often presented to the public with dramatic visualisations or abstracted disaster imaginaries; such as the image of a stranded polar bear and melting Arctic ice (Sheppard, 2011), drought-stricken children, accelerating trajectories in scientific charts, red hot global warming temperature maps, or even apocalyptic scenarios in science fiction movies such as *The Day After Tomorrow* (2004). Thus, people may have little idea of how climate change will actually affect them in their everyday lives. A general example will be that no one knows what an average increase of two-degrees of global warming might actually look like in the area where they live. As a result, climate change's dramatic narratives had failed to bring people's sense of urgency in order to address climate change-related issues.

**This study identifies and explores extreme flooding as one of the frequent threats due to climate change impacts in areas within the two states of Peninsular Malaysia.** Located in South East Asia, Malaysia<sup>3</sup> is a country with abundant rainforests (as natural heritage) and rainfall, which becomes the main water resource. The topography of Peninsular Malaysia consists of coastal area and mountainous regions; the land area is approximately 132,631km<sup>2</sup> and its coastal length is about 1,938km<sup>2</sup> (MNRE, 2015). Malaysia has an equatorial hot and humid climate throughout the year. Rainfall distribution is greatly influenced by topography and the monsoon winds (MNRE, 2015). Similar to other countries, Malaysia is also experiencing adverse effects of climate change. The heavy rainfall that lasts for three days or more during the monsoon season usually causes severe floods. According to the scientific report from the Malaysian Meteorological Department titled 'Climate Change Scenarios For Malaysia 2001 - 2099' (2009), the temperature and rainfall

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<sup>3</sup> Malaysia consists of 13 states, 11 states (Johor, Melaka, Negeri Sembilan, Selangor, Perak, Kedah, Perlis, Pulau Pinang, Pahang, Terengganu and Kelantan) are located in Peninsular Malaysia, and the other 2 states (Sabah & Sarawak) are in the island of Borneo - separated by the South China Sea.

are projected to increase in 60 years respectively and the rise of sea level will be about 13-94cm in 100 years.

The future climate projections or scenarios however, are seen to be more at a global level but ‘unforeseen’ among local communities (Tyszczyk, 2011). While the scientists and policymakers are increasingly concerned with the potential catastrophic consequences of climate change (Devine-Wright, 2009), people at public or local level are more unaware of the consequences (Meerah et al., 2010). Nevertheless, disaster impacts such as flood, severe haze, and landslide (Othman, 2011) affect water resources, food supply, public health, and human settlement (Begum et al., 2011). These disaster effects occur frequently at regional level where the local populace is more physically and emotionally attached to their locale and when, as a result, people’s lives are disrupted, the experience has a marked psychological effect. Disasters cause severe physical damage to people’s belongings, affecting their basic needs such as shelters, houses and possessions. Jasanoff (2010, p. 241) expressed that, ‘people view threats with greatest alarm, and are readiest to act defensively, when the place under siege is personally valued’. Furthermore, Jasanoff (2010) acknowledges that the slogan ‘Think Globally, Act Locally,’ affirms both the possibility and promise of connecting global climate change issues back to the personal.

*“Architects are taught to focus on the product (buildings), whereas humanitarian practitioners major on the process (involving people)”*

– David Sanderson, 2010

**The thesis attempts to focus on the impact of major seasonal or monsoon<sup>4</sup> floods in Malaysia that subsequently resulted in an unexpected, involuntary displacement and permanent relocation of local communities.** It is acknowledged that there are various actors or agencies involved in post-disaster scenarios. Nevertheless, **this study is addressed through the perspective of architecture and the built environment, and the ways in which architects responded and should have responded to the available scenarios.** The ‘movement’ of people due to floods is seen to be associated with the increased adverse impacts of anthropogenic climate change<sup>5</sup>. There is however, **little research on displacement and relocation caused by disastrous flooding specifically in the context of Malaysia.** This may be due to the assumption that flood disaster was common and a temporary phenomenon, occurring by chance, and where people were usually able to return to their homes once the floodwaters had receded.

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<sup>4</sup> Refer to section 2.2

<sup>5</sup> Anthropogenic climate change is an environmental disaster originating in the human activity.

By contrast, the latest major floods occurring within the last 15 years in Malaysia have resulted in large numbers of people being displaced unexpectedly, and unable to return back to their properties permanently. Moreover, **little progress has been made to monitor the impact of permanent displacement or inquire into the process of return from displacement due to flood disasters in Malaysia.** Generally, in post-flood situations, after the victims have returned to their homes or were seen to have found solutions to their displacement or relocation, the humanitarian relief provided is usually halted. Furthermore, the process of reconstruction and rehabilitation is left to the responsibility of the local authorities and development actors.

It is crucially important for architects to help provide the solution to the design of shelters after a disaster (Rose, 2010), however, Sanderson (2010) underlined that, the 'architect is often the last person needed in post-disaster reconstruction'. The reason being because architects are said to be inadequately prepared to work in this context (Sanderson, 2010; Tauber, 2014). Meanwhile, architects continue to play an important role in post-disaster recovery and development, and in situations where the impacts and frequency of natural disasters are increasing (Sanderson, 2010; Tauber, 2014; Wagemann and Ramage, 2016). One of the most critical concerns when disaster strikes, is how to accommodate the affected people, who have been displaced as a result of the disaster.

Providing shelters is necessary to provide security, personal safety, prevent disease outbreaks, preserve human dignity and more importantly to protect from the ever-changing climatic conditions (UN-OCHA, 2008, p1). According to Wagemann and Ramage (2016) there are three phases in the common approach to sheltering people, among them are emergency shelters, temporary accommodation and permanent housing. However, many transitional or permanent solutions have been condemned for transplanting foreign architecture, without engaging and responding to the unique conditions of the affected population, ignoring the characteristics of place including the culture, site and climate (Kelly and Caldwell, 2014; Silva, 2011; Tauber, 2014; Wagemann and Ramage, 2016). The consequences of ignoring or not understanding the vernacular context - especially people's housing culture and livelihoods within the framework of post-disaster reconstruction, has resulted in unwanted outcomes such as 'social disruption' among the resettled people (Chan, 1995).



Furthermore, from the users' point of view, it is important to highlight that the experience of communities from planned relocation or resettlement has always been, 'predominantly negative' because, 'the communities suffer when they are moved' (Ferris, 2011). This has often resulted in affected communities attempting to return to their existing homes, although still vulnerable to future disasters. Cronin and Guthrie (2011) pointed out that the failure of relocations or resettlement initiatives were due to the issue of distance that the communities had to endure from their new settlements. This situation can be understood further as Chan (1995) highlighted that the relocation process provokes adjustments and can lead to the breakdown of social life especially when confronted with an unfamiliar environment.

While the study does not intend to seek post-disaster physical solutions or architectural outcomes for displaced communities, such as temporary shelter or planned resettlement, **it does however, centre on the role of architects in post-disaster recovery. Moreover, the study attempts to examine and evaluate the significance of 'transit time' or the temporary period of post-flood disaster displacement, both conducted through fieldwork and case studies.** The study questions why and how a temporary settlement during the transition could be significant to post-flood disaster in either the relocation or return (refer to Chapter 5), whilst acknowledging lessons learnt from a completed resettlement occurring earlier (refer to Chapter 4). The study echoes Davis' (1978) notion that a building shelter should be understood as a process and not a product, hence a long-term reconstruction should consider the local culture, functions and end-user rather than merely provide a solution or artefact.

In addition, the study **addresses the approach whereby built environment professionals such as architects should respond to the temporary post-disaster resettlement, either in technical or cultural terms. This allows the architecture industry to face up to the challenge of post-disaster scenarios and to take the necessary steps in preventing the adverse effects of future climate change.** The study makes reference to recent extreme flood disasters, as this is currently the biggest environmental threat in the Malaysian context.

In order to understand the challenges of flood-related disaster, the study has focused on the narratives of flood-affected communities from two case studies. Both case studies are located in Peninsular Malaysia. The first is the 2006-07 flood-affected community in Kota Tinggi

district of Johor, while the second is the 2014 flood-affected community in Kuala Krai district of Kelantan. The latter case study was a community displaced by a major flood event, which occurred unexpectedly during the first phase of the study's fieldwork. This resulted in an opportunity for a new understanding and experience of the transitional process following flood disaster in real-time.

### 1.1 Climate change narratives

Understanding climate change requires 'multiple framings and perspectives that need to be provisional and evolving' (Smith et al., 2014). The unexpected and complex situation of climate change often results in mixed responses (Tyszczuk, 2011) as people will both have doubt or be alarmed by the condition of uncertainty, and at the same time accepting of the unwanted problems taking place. Tyszczuk (2011, p. 25) defines this situation to have similarities with the phenomenon of the 'Stockholm Syndrome', with, 'the hostages becoming emotionally attached to their captors' as quoted:

*"Little wonder that the political and social response to climate change is so mixed: disengagement seems an obvious response. Environmental issues are viewed as intractable, regardless of what we do, and at the same time we have become maybe a little bit too comfortable with the bad news stories that keep on coming. We think of ourselves as constantly at risk of being overwhelmed by forces beyond our control. Sometimes we behave as if the anthropogenic components of global environmental change have taken us completely by surprise.*

*We are adept at turning a blind eye to the blindingly obvious. This stasis around climate change discourse has carried on for at least two decades and we have become used to the feeling of being stuck. It is as if we are unable to make our own choices in spite of good information that offers routes to self-preservation. In short, we are held captive by our own fears and misgivings and yet grateful for the small mercy of continued survival: a climate change equivalent of **Stockholm syndrome**. Like the hostages in the 1973 bank robbery, we have started to show affection for the thing that is trapping us."*

Climate change is commonly associated with the physical or scientific phenomena that can be observed, quantified and measured. Despite the urgency of this issue and what many consider as an imminent disaster occurring on an unprecedented scale, climate change has evolved into a progressive movement that brings broader meanings and purposes <sup>6</sup> (Hulme, 2011a). Climate change is as much a political, social and cultural event (Shove, 2010; Yusoff and Gabrys, 2011a).

Smith (2011a) has suggested understanding these interlocking issues by recognising the unique features within the cultural politics of climate change. There are six dimensions of knowledge that are 'inter-related' to the cultural politics concerning climate change (Figure 1.3). The cultural politics is defined as, 'ways in which the values and meanings that underpin the economics, politics and society are generated and argued over' (Smith, 2011a, p. 17). The virtue of these elements however, does not rely on individual consequences, rather a combination of all (2013, 2011a). These elements need to be understood together in order to understand the past, present and likely future of the topic, as compared to the single and unambiguous approach to climate science and politics. Understanding the distinctive features of climate change may allow more people to be inspired and feel prepared to respond to difficult situations. One aspect of this is to engage people in the issues with narratives and stories that are more relevant to them.



Figure 1.3 Six elements of the cultural politics of climate change

<sup>6</sup> Refer to section 2.1.4

**There are two modes of narratives drawn on in this thesis.** The first is the modern narrative or scientific assessments of climate change, such as the technical approaches of the IPCC and UNFCCC. Second, are the traditional narratives or personal stories and experiences within communities. The modern or scientific 'narrative' presented in the global media was prepared by experts and later transmitted to the public. Although research, official reports and discourses on climate change have been made accessible to the public, Bushell et al. (2016) point out that the issues are difficult to discuss effectively. Climate science research has particular narrative properties; these are less beneficial to others outside the organization, or laymen (Lejano et al, 2013). The scientific narratives tend not to portray any specific author or any particular audience and often present selective information that eliminates experiences and emotions. This type of narrative also tends to explain in general or in universal terms that are presented as statements or facts.

In the article 'A New Climate for Society', Jasanoff argues that climate change, 'offers unique challenges and opportunities for the interpretive social sciences', in order to establish 'ways of understanding the human condition in nature' (2010, p.249). Although IPCC's scientific discourses helped established climate change as a global phenomenon, the scientific knowledge remains disconnected from meanings during the discussion process (Jasanoff, 2010). Its objective representation of climate change has taken over the 'subjective, situated and normative imaginations of human actors engaging directly with nature' (Jasanoff, 2010, p235).

The study acknowledges that the mass media plays an important role in disseminating information on climate change. Nevertheless, common narratives for climate change discourse such as *The Gore*, *Every Little Helps* and *End of The World* are 'particularly ineffective' (Bushell et al., 2016). Constant focus on the crisis such as in *The Gore* narrative have 'led to over-emphasis on certainties' (Smith, 2014, p. 20). Surveys conducted have shown that the public, including in Malaysia, is profoundly aware of climate change (Ahmad et al., 2012; Alam et al., 2015; Ghazali et al., 2015; Lejano et al., 2013; Ngai Weng et al., 2017), however most of the Malaysian public does not consider this matter as a priority as compared to other topics such as environment, crime, economy, transportation and social issues (Ngai Weng et al., 2017). As a result, although climate change uncertainties are disturbing, 'the importance of handling the environmental issues is not being accurately communicated to the public' (Ahmad et al., 2012).

On the other hand, the climate narratives that originate from observation or traditional personal narratives, convey valuable meanings embodied in the experiences of the affected people. Personal narrative involves a specific narrator with specific characters or qualities drawn from their experience. It is a unique way in expressing different voices among the people as articulated in art, story, memoir and reminiscence. Eventually, personal narratives are also proclaiming the people's pride of and attachment to a specific place. Narrating or storytelling enables people to discover their voice through which they can manifest their experiences, in the form of talks, debates and sharing stories with others.

In order to encourage people to act on these global issues locally, climate change needs to be assimilated in everyday narratives so that people could act, think, feel and talk about themselves and their world. It has to be 'more commonplace and not to be isolated from other issues - that occupy people's everyday lives' (Lejano et al, 2013). There are various discussions addressing the importance of integration between the scientific representations and discourses of climate change such as those of the IPCC and UNFCCC, with the local social climate responses taking place. Similarly, the study attempts to assimilate the scientific global issues within the locality by exploring the personal narratives of people who had experienced extraordinary events, presented in the case studies of Chapter 4 and Chapter 5.

## 1.2 Research context

**This study aims to investigate the architect's participation in post-disaster recovery, particularly in the context of temporary homes in the 'transit time'. It examines the aspect of temporary time in order to understand the influence towards the development of post-disaster permanent relocation and resettlement process within the subject of architecture.**

Through exploring the matter, the study considers this key question:

**What is the significance of the transitional period and temporary homes towards the development of the post-disaster permanent resettlement process; including the role and relevance of architects in post-disaster recovery?**

The main question is followed by several sub-questions that will be explored and reflected upon throughout the research:

- 1) Why is it important to study post-disaster recovery and how can architects respond to or play a part in this situation?
- 2) How does the empirical work (such as narratives) of this study contribute to an understanding of post-disaster situations?
- 3) What can be learnt or reflected on from the relocation and resettlement processes post-disaster?
- 4) How could the concept of temporary home in transition and transit help in improving the architectural aspects of post-disaster resettlement?

### 1.2.1 Key terms

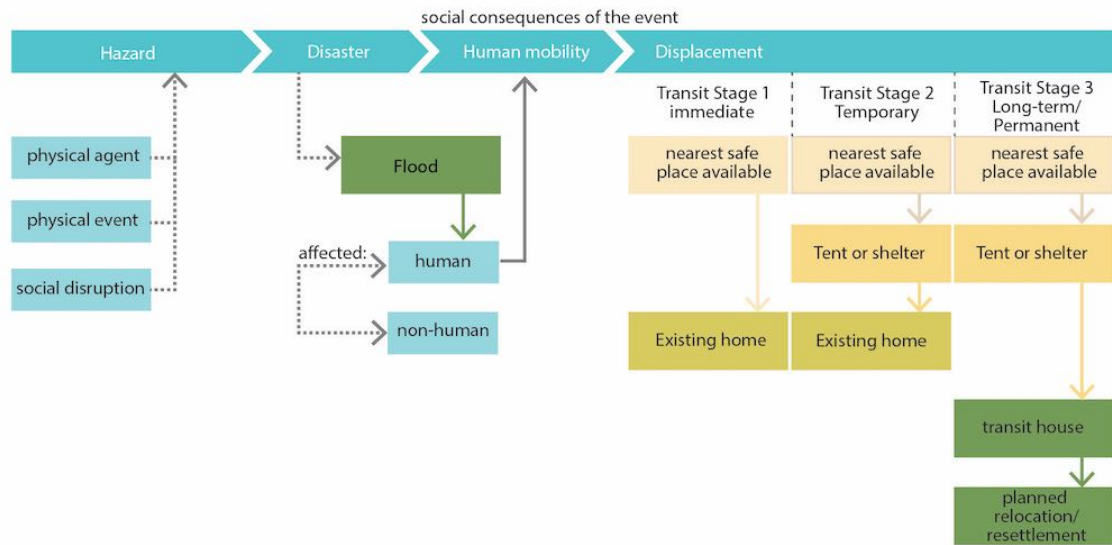


Figure 1.4 Key terms explained based on research flow.

There are key terms used throughout this study (Figure 4). This section is intended to explain the meaning intended within the context of this study considering how the terms are intertwined in this research:

(i) Hazards and disaster

*'...A disaster is perhaps easier to recognize than it is to define'*

-Barkun 1974, p. 51

Natural hazards are classified as intense and extreme weather, and climate events that occur in all parts of the world but appear in different levels of severity, which cause vulnerability to some regions (WMO, 2018). Natural hazards 'only become disasters through their encounter with human vulnerability' (Massazza et al., 2019, p. 1). A natural hazard is classified as a disaster when the event affects people's lives and their livelihood. According to *Malaysia National Security Council - Directive 20* (2012, p. 20), disaster is defined as, 'a sudden-onset event that disrupts people's activities and causes them loss of life, property damages, economic losses and environmental damages that goes beyond the ability of communities to cope and require extensive resource mobilization action'.

Although disasters are related to natural hazards, scholars, especially from among environmental geographers have, 'generally accepted that there is no such thing as natural disaster' (Smith, 2006).

Carr (1932) argued that a disaster results from human beings' actions, not by nature, as not every natural event is a catastrophe. The natural event that happens is considered a 'disaster' only when there are deaths, serious injuries or losses during the event (Carr, 1932). This was also highlighted by the UNDP policy specialist on Disaster and Climate Risk Governance that 'natural disaster' does not exist, however it was pointed out that hazards are defined as a disaster from, 'the way societies develop, build and construct' (Ras, 2017).

There are many discussions among scholars about disaster. The fundamental question of 'what is a disaster?' has been of interest especially among the social sciences' researchers. Massazza et al. (2019) states that the distinction between natural and man-made disasters has long been critical in the field of disaster science. The distinction seems to be difficult from the social point of view as it does not take into account the 'symbolic and interpretative process', through which the survivors of disaster understand what has happened (Kroll-Smith J et al., 1991). Quarantelli (1994, p. 3) studies disaster from the perspective of Western societies, where he discusses the way disasters are visualized and how distinct understanding has evolved in different societies, thus, collectively altering the way of thinking and attitudes about the risks in the face of disaster. Concepts of disasters have undergone three significant stages and adjustments throughout time (Furedi, 2007); as well as being interpreted through 'a system of meaning provided by culture'.

Disasters were originally attributed to the supernatural and were characterized as Acts of God, 'with the implication that nothing could be done about their occurrence' (Furedi, 2007, p. 483). Subsequently, a different perception of disaster has emerged, with the 'development of secularism' (Furedi, 2007, p. 483) as well as the, 'development of science as another way of obtaining knowledge' (Quarantelli, 1994, p. 3). Eventually, disasters were gradually seen as Acts of Nature where these events were understood as beyond human control, for example earthquakes are understood as linked to plate tectonics. Thus, steps like engineering and structural measures can play possible roles to 'lessen the negative effects of the ensuing disastrous occasions' (Quarantelli, 1994, p. 3). The view has shifted again, whereby the latter idea 'was displaced by another view that disasters resulted from the Acts of Men and Women' (Quarantelli, 1994, p. 4). This connects ideas of disaster to the inappropriate actions of human beings, whereby disaster is thus considered avoidable and preventable by humans themselves.



Disasters are becoming prevalent due to the increase of people building and living in prone disaster areas. Perry (2007) highlights that disasters are not only events but the social consequences of the event. Subsequently, disasters become 'inherently political events' as they raise the questions of 'who should be allowed to re-define the territory' and 'how it should be done' (Fariás, 2014).

The relationship between non-human (physical) and human elements in the definition of disaster, was outlined by Quarantelli (1987) in his article, *'What is disaster? The need for clarification in definition and conceptualization in research'*. He elaborated the meaning of disaster that is associated with seven elements; 1) The physical agents, 2) the physical impact of such physical agents, 3) an assessment of physical impacts, 4) social disruption resulting from an event with physical impacts, 5) the social construction of reality in perceived crisis situations which may or may not involve physical impacts, 6) the political definition of certain crisis situations, and 7) an imbalance in the demand-capability ratio in a crisis occasion. He argues that 'disaster' does not primarily refer to physical references (point 1 to 3), but also relates to the immaterial, particularly in the disruption of social structure - resulting from the potential or actual impact of agents (point 4 to 7).

(ii) Extreme flood disaster

A flood is classified as a sudden-onset disaster, as it 'comprises hydro meteorological hazards' (Nansen Initiative, 2015). Flooding can be defined as any area of land that is normally dry, being covered by water. The water level can either rise slowly unnoticed, or rise rapidly, suddenly and unexpectedly. There are two types of common floods in Malaysia: flash flood and seasonal flood. Flash flood occurs when the amount of rain at a specific place is high and within a short period of time overflows the area. Then, the floodwaters recede quickly when the rain stops. This is commonly due to the sewerage system that is managed poorly, especially within the urban area.

Meanwhile, the seasonal flood, also identified as the Monsoon flood, happens during the monsoon season. There are two monsoon seasons in Malaysia. The first is the Southwest monsoon between April and September and the second is the Northeast monsoon between October and March. Though, the Northeast monsoon brings in more rainfall as compared to the Southwest monsoon. During the monsoon season, the rain pours continuously for a long period of time and

consequently the river overflows and water covers the surrounding areas or flood-plain areas for a long time, taking a long time to recede. This is due to the condition of soil, which becomes saturated as it absorbs an unusually large volume of water.

Chan (1997) compares the scales of seasonal flood that is between normal and major flood in Malaysia. According to Chan, normal scale seasonal flood occurs annually during the Northeast monsoon between November to December and, 'people living on the east coast are well adapted to normal flood'. The major flood, however, is an 'unusual and extreme' event that makes people more vulnerable as it is extreme and unpredictable which resulted in significant loss of life, damaged to livelihoods and public infrastructure. Although major scale floods do not happen frequently, the disaster marks a huge impact on the affected people and place, physically and psychologically. Monsoon floods can sometimes occur in consecutive years or months. For example, in Kota Tinggi, the major floods had happened in consequent years of December 2006 and January 2007. Therefore, this research focuses on major seasonal floods.

### (iii) Human mobility

According to the Nansen Initiative report (2015), human mobility refers to three forms of population movement: 1) *Displacement* is considered as the primarily forced movement of persons, 2) *Migration* refers to voluntary movement of persons and, 3) *Planned Relocation* is a planned process of settling persons or groups to a new location. Ferris (2011) describes clearly the differences between these terminologies and highlights the consequences of these movements:

*'When people move on their own, they are considered to be migrants. When they are forced to move, they are displaced. While the degree of voluntariness of the decision varies significantly, for both migrants and the displaced, 'the locus of control is with them'. However, when people are moved as a community as a 'planned relocation, the locus of control is with others, usually the government' (2011, p. 2).*

This thesis centres on the issue of displacement and planned relocation. Disaster displacement refers to 'situations where people are forced to leave their homes or places of habitual residence as a result of a disaster or in order to avoid the impact of an immediate and foreseeable natural hazard. Such displacement results from the fact that affected

persons are exposed to a natural hazard in a situation where they are too vulnerable and lack the resilience to withstand the impacts of that hazard' (The Nansen Initiative, 2015).

There are several different definitions of relocation. In the book titled, *'Safer Homes, Stronger Communities: A Handbook for Reconstructing after Natural Disaster'*, The World Bank defines relocation as, 'a process whereby a community's housing, assets, and public infrastructure are rebuilt in another location' (Jha et al., 2010, p. 77). Meanwhile, others have emphasized other dimensions in defining relocation as the 'permanent (or long-term) movement of a community (or a significant part of it) from one location to another, in which important characteristics of the original community, including its social structures, legal and political systems, cultural characteristics and worldviews are retained, [therefore, as a result] the community stays together at the destination in a social form that is similar to the community of origin'<sup>7</sup>. In short, issues concerning planned relocations should be emphasized on the significance of a community as a whole, rather than treating it as an individual intent.

#### (iv) Transition in post-flood disaster

I have chosen to use the terms 'transit time' and 'transit home' in this thesis as new concepts in understanding and defining the complexity of post-disaster responses. Generally, transit refers to the carrying of people or things from one place to another or, the action of passing through or across places. Meanwhile, transitory refers to temporary or within short period of time or impermanent.

In the framing of these terms, I have drawn on the work of several scholars, who have influenced my understanding of 'transit' in the context of post-disaster. In the article *'Whose reality count: shelter after disaster'*, Burnell and Sanderson assert that, 'providing adequate shelter is one of the most intractable problems in international humanitarian responses'. Transitional shelter has become a 'response of choice' (Burnell and Sanderson, 2011, p.189), in tackling the issue of post-disaster recovery. Nevertheless, this type of shelter has been disputed as it often becomes

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<sup>7</sup> John Campbell, 'Climate-Induced Community Relocation in the Pacific: The Meaning and Importance of Land' in Jane McAdam (ed), *Climate Change and Displacement: Multidisciplinary Perspectives* (Hart Publishing 2010) 58–59

permanent, hence inappropriate as it addresses 'short-term solutions that do little in addressing long-term problems' (p. 189). The changes in its function - from temporary to permanent is seemed to cause additional issues in the future as it may create other undesired spaces for potential squatter house.

Nevertheless, instead of addressing the idea of transit or transitional shelters that are literally referred to as physical objects, this study focuses on the **transit time that is associated primarily within the period *in-between* two settlements**; the existing or original settlement before and the 're'-settlement after disaster. **The importance in studying temporariness in between the two periods of disaster (before and after), is thought to address intermediate solution within this pivotal timeframe. It reflects on a transit period that is uncertain but often possibly extended to become their new 'home', whether desired or not.** While the term 'transit time' refers to the timeframe in between disaster and post-disaster, **the term 'transit home' used in this thesis refers to a place and environment that people have settled into, for a certain period of time and responding to their variety of cultural or psychological needs.** Therefore, the subject of this study refers to the people who were affected by the flood disasters in Kota Tinggi and Kuala Krai.

Another term used here is 'transit shelter' that describes a house initiated by Mercy Malaysia under The Temporary Shelter Program for a number of affected families during the 2014 flood in Kuala Krai. The transit shelter was built in a cluster and then named as *Perkampungan Mercy Tualang* (Tualang Mercy Village). The term 'transit shelter' in this discussion brings the same meaning of 'makeshift shelter' or 'transitional shelter'; which represents the temporary structures that are better than a tent, however with a shorter lifespan until the permanent house construction or reconstruction is achieved.

(v) Resettlement after post-flood disaster transition

Resettlement is a process that introduces the displaced community into a new built environment. This study examines the extent to which permanent resettlement has been successful in moving at risk flood plain inhabitants.

### 1.3 Transit Time and Transit Home in Kota Tinggi, Johor and Kuala Krai, Kelantan

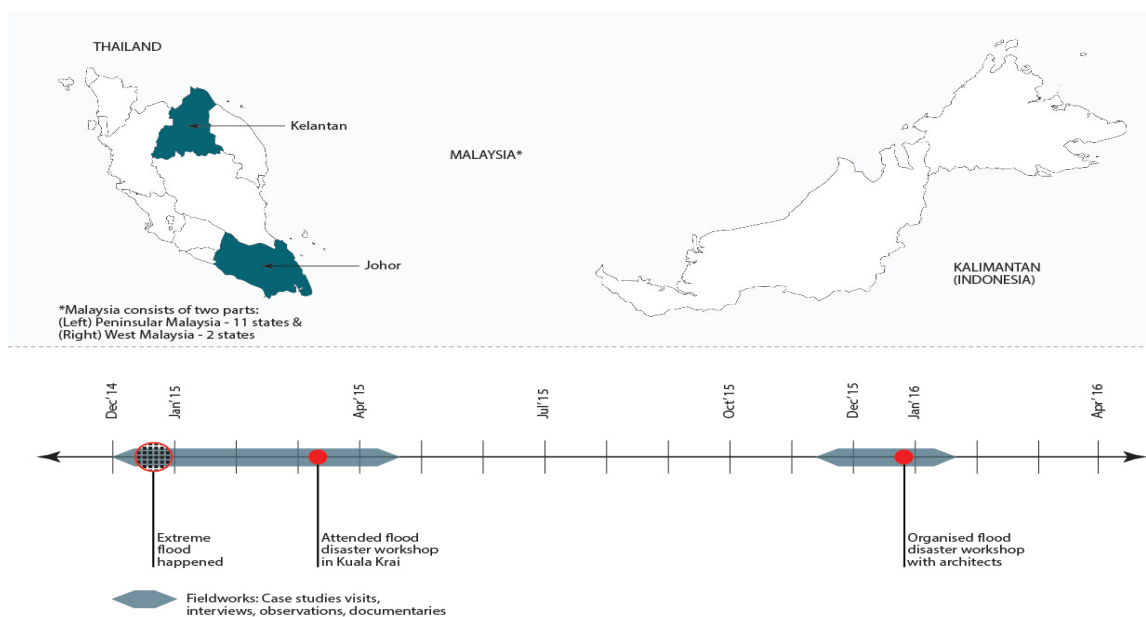


Figure 1.5 shows the location of Johor and Kelantan in Malaysia. (Below) The timeline of fieldworks conducted in Malaysia and important time highlighted following from the extreme flood happened in December 2014.

As mentioned earlier, the study focuses on two specific locations within Peninsular Malaysia as case studies (Figure 1.5). One is located in Kota Tinggi town in Johor and the other in Kuala Krai town in Kelantan. In the years 2006 and 2007, extreme rainfall caused flooding in four states of Peninsular Malaysia – Johor, Melaka, Negeri Sembilan and Pahang. The floods resulted in more than 100,000 people being affected and 18 deaths. Kota Tinggi is one of the towns in Johor that was severely affected. The flood struck consequentially in two unusual waves in December 2006 and January 2007, resulting in the displacement and subsequent permanent relocation of thousands of people, especially 360 families from six *Kampung*. The disaster resulted in them needing to stay in ‘transit’ for 5.5 years before being relocated to a new settlement in July 2012. The new settlement being a few kilometers away from their original one.

The second case study is in Kuala Krai. In December 2014, the state of Kelantan, located on the East coast of Malaysia, was hit by extreme and abnormal rainfall, which caused a severe flood event in all Kelantan districts. Known as ‘Bah Kuning’ or Yellow Flood due to the muddy water that carried laterite soils from the hills, the flood affected about 160,000 people in Kelantan, 1,250 families totally lost their houses and there were 10 deaths. Buildings were inundated up to the third and

fourth floor in some places. The extreme rainfall resulted in a massive amount of water flowing into the tributaries of Sungai Galas and Sungai Lebir, forming a bottleneck towards Sungai Kelantan. Kuala Krai was one of the areas affected severely by the flood as it is located at this 'river branch'. Therefore, it has been chosen as a case study.

The extreme flood in December 2014 happened simultaneously during this study's first phase of fieldwork. As a consequence, adjustments to the study framework had to be made in order to incorporate this unexpected but relevant event. Accordingly, this flood event in Kuala Krai has offered me first-hand experience in dealing with a flood-affected situation and the opportunity to observe the people who dwell in the 'transit homes' provided immediately after the disaster.

The distribution of population especially in the case studies areas relates closely to the history, demographics, geography, economic and cultural factors. Malaysia is a multi-ethnic and multi-cultural country of which approximately 62 per cent of them are Malays, and by definition are Muslims (Department of Statistic Malaysia, 2020). Meanwhile, Buddhist population are at 19 per cent, Christian 9 per cent, Hindu 6 per cent, and others at 4 per cent. Malaysia population consists of three main ethnic groups; the Bumiputera as the largest population that represent 69.6 per cent, followed by Chinese (22.6 per cent), Indian (6.8 per cent), and others (1.0 per cent) (Department of Statistic Malaysia, 2020). The Bumiputera category includes the Malay ethnics and indigenous people, which are the *Orang Asli* and *Anak Negeri* (mostly living in East Malaysia).

The Malay is defined as the original inhabitant in Malaya (now known as Malaysia). The main economic activity of the Malay was in trading while the Malay on the East Coast such as in Kelantan and Terengganu, were mainly involved in fisheries, agriculture and small business activities. Nevertheless, the Malay economic control declined after the intervention by the British through the entry of foreign labourers such as from China and India. The Chinese population was very low before the colonization and started to increase subsequently in the 19<sup>th</sup> Century. They were mostly miners, who migrated due to the development of mining in Malaya. Indians later came into Malaya to work mainly as farmers in rubber plantations. In 1949, after the anti-communist war,

about half a million people<sup>8</sup> were ‘physically removed from isolated rural locations into compact settlements specially created for the purpose<sup>9</sup>’ (Sendut H.,1962, p. 41) and resulted in the establishment of 440 new resettlements. One third of these resettlements was a result of regrouping paid workers mainly within rubber estates, coconut plantations, tin-mining locations and forest areas leased for timber exploitation. The remaining two-thirds were resettlement villages developed mostly from existing resettlements nearby. This had resulted in a ‘social revolution’ (Sendut H., 1962) where the population of these villages, which was later converted into planned resettlements or urban areas, were predominantly non-Malays.

It became one of the main factors that further influenced the Malay population distribution in Peninsular Malaysia that was mostly located in the rural or sub-urban areas. Until 1957, the Malay represented 49.8 per cent of the total population in Malaya, before the establishment of Malaysia in 1963, and has increase subsequently until the present time. Meanwhile, the main ethnic group population in Kota Tinggi and Kuala Krai district remains largely of the Malay race (Table 1.1), therefore the study has focused on the Malay group in observing their views on floods and other issues related closely to their religious belief and culture. This is particularly evident in both case studies presented which will be explained further in Chapter 4 and 5.

Ethnics		Districts			
		Kota Tinggi, Johor		Kuala Krai, Kelantan	
		People	%	People	%
Bumiputera	Malay	144,800	84.6%	149,018	90.8%
	Orang Asli/ Anak Negeri	1,580	0.9%	-	-
Chinese		18,817	10.9%	9,862	6%
Indian		5,592	3.3%	4,545	2.7%
Others		567	0.3%	527	0.2%
Total		171,356	100%	163,952	100%

Table 1.1 Total population by ethnic groups in Kota Tinggi, Johor and Kuala Krai, Kelantan in 2010. (Source: Department of Statistic Malaysia, 2020)

<sup>8</sup> This figure amounts to an estimate of 541,458 people or 77,846 families involved, where 87 per cent of them were Chinese, 8 per cent were Malays and 4 per cent were Indians.

<sup>9</sup> The scheme of resettlement was primarily due to ‘localized terrorist activities and preventing the co-ordination of communist gains.’ These resettlements were developed within 10 miles of Kuala Lumpur.

## 1.4 Thesis structure

Chapter One (Study background) has established the overview for this study by explaining the wider context in which the research took place. The study outlines the importance of understanding extreme monsoon flooding as a frequent disaster threat resulting from climate changes and their impacts. This is conducted through the use of narratives as one of the main methodologies. Flood disasters have caused unexpected, involuntary displacement and the permanent relocation of affected communities, and therefore the chapter also highlights the reason why post-disaster dwelling in the transitional period is significant. This study questions the role of architects and their response to this temporary situation of post-disaster resettlement.

Chapter Two (Literature Review) provides an in-depth background relevant to climate change, disaster and culture, within the context of architecture. The narratives, framings and imaginaries from both official documents such as the IPCC reports and personal narratives are presented. Apart from the narratives, the chapter is framed through climate imaginaries, especially in relation to flood disaster in local culture and architecture. These will be important aspects to address the issue of practising architects' understanding and design approaches related to climate change in Malaysia. Understandings of both narratives are essential in the development of the objectives and methodologies of the study. Furthermore, the study attempts to understand the flood disaster situation in Malaysia and its impacts on the affected communities, particularly in reference to the dwellings in transition within 'transit time' leading to involuntary relocation or resettlement.

Chapter Three (Methodology and Methods) highlights the approach and methods used throughout the study. The study has deployed a hybrid-methodology that emerged from the recognition of different experiences, narratives or documented evidence relevant to both case studies.

Chapter Four (The story of Kota Tinggi) narrates the stories from the fieldwork experiences in Kota Tinggi, Johor. This chapter contributes to the narratives of the affected community that was relocated from their original *kampung* to a newly constructed housing resettlement due to the series of extreme floods in December 2006 and January 2007. The chapter begins with the history of flood events in Kota Tinggi in order to understand the background and chronicles of flood histories, which is



then followed by recent events in 2006 and 2007. The historical evidence includes the sequential timeframe, post-flood recovery and responses in its aftermath. This chapter also highlights the relocation and new resettlement set up by the local government called Desa Sejahtera. I explored the critical issues and questions of how the present-day flood disaster responses could learn from the relocation process and the outcome of this new settlement. While conducting fieldwork in 2014 in Desa Sejahtera, there was an unexpected and extreme flood event in Kuala Krai, Kelantan, that provided an impromptu opportunity for the study to explore issues around resettlement post-disaster further. Therefore, the last part of this chapter (section 4.6) reviews a workshop jointly organized by the government and NGO, in which I managed to participate. The workshop was conducted 3 months after the flood event to discuss issues within the post-flood situation; henceforth the workshop is the starting juncture of the Kuala Krai case study exploration (in Chapter 5).

Chapter Five (The story of Kuala Krai) centres on the story of fieldwork in Kuala Krai, Kelantan. This chapter documented the narratives, observations, reflection and fieldwork from the flood, which occurred in December 2014, that was considered unprecedented in Malaysian history. The flood had forced large numbers of families to be displaced and relocated to several new settlements. This unexpected disaster was a personal shock and influenced the adjustment to a new trajectory for the study. The opportunity to experience and understand the flood situation first-hand is a distinctive contribution to the study. The study on Kuala Krai explores the actions taken during the post-disaster transit time and established a link between the issues of relocation in Kota Tinggi encountered in Chapter four. The concluding part of this chapter provides an account of discussions from a workshop conducted with local architects. The discussions relate to the architectural responses to flood events in Malaysia and specifically to the displacement and resettlement of communities in Kuala Krai.

The final chapter, Chapter Six, focuses on Temporary Home in Transit Time, which is divided into three parts. Each part approaches this thesis from different angles leading to the findings of the study and the possibilities for action. Furthermore, this chapter revisits the case studies and reflects on the personal narratives of flood-affected people through interviews and personal observations made during the fieldwork. Secondly, the study reviews findings based on the narratives gathered from built environment professionals, among them architects involved in

post-disaster and reconstruction in Malaysia. This section also makes recommendations for architects in outlining their roles and the necessary actions and steps required for disaster responses particularly in post-flood situations. It is important to highlight that the recommendations are framed within both the scientific and personal narratives.

Finally, the study emphasises the contribution of the study, to both scholarship and practise of architecture within the discussion of post-disaster displacement and resettlement. Part of this conclusion reflects on the aspect of transit time and transit homes, where again the study highlights the relevance of consideration of the transit time and space in post-disaster, rather than a focus on the outcome of physical architecture or objects. The chapter revolves around the transit process manifested from the case studies and discusses why an appreciation of temporary homes (in the livelihoods of communities) in transit time is crucially important. It concludes with a discussion on the role of architects, in the process of rebuilding communities in post-disaster, either emotionally or physically.

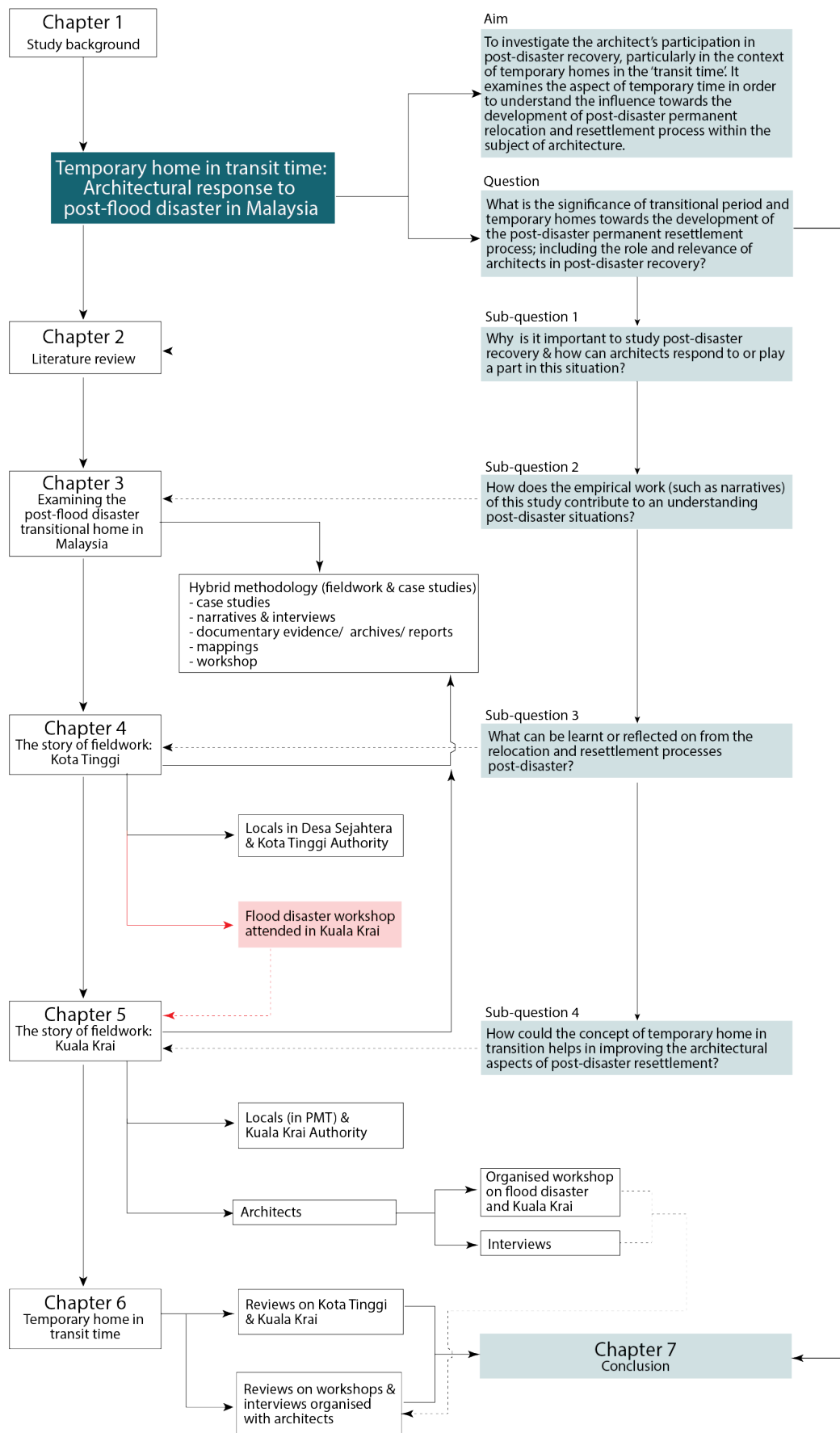


Figure 1.6 Thesis structure overview diagram. Refer to Appendix 1 for larger scale format.



# Chapter Two

## Architecture and Climate Change Impact: The Flood Disaster in Malaysia

### 2.0 Introduction

Chapter Two presents a study of the literature related to the transition period within Malaysian post-flood disaster scenarios focusing on the contribution of architecture to the impacts of climate change. The study looks at histories of past disaster crises and the development of climate change policies, which have drawn on the IPCC Assessment Reports and IPCC Special Reports, particularly on aspects of people's vulnerability and their ability to respond in the aftermath of disaster. The focus of the study is on living in transition after flood disaster, and it has emphasised that the issue of temporary home needs to be explored in its multifaceted dimensions. This is in order to provide a comprehensive view of architecture that addresses not only physical structures (or houses) but the social, cultural and technological long-term needs of communities (or homes).

The chapter begins with an exploration of the complexity of climate change and framing the issue within the research context in section 2.1. It covers risk and uncertainty that is due to changes in climate and human interventions through scientific and social perspectives. These changes or threats have largely impacted people's livelihoods and lifestyles. Climate disasters such as floods are often likely to result in the involuntary displacement or relocation of people to safer places. Nevertheless, further evaluation and consideration are urgently needed in order to prepare a better living environment for the displaced community while at the same time adapting to the new situation. The involvement of agencies from government, and private or non-governmental organisations is essential. This involvement includes the architectural professions, who play a vital role throughout the making of architecture that is responsive to changes resulting from climate disruption and disaster. The study includes an investigation of the meanings of climate change through the lens of its cultural dimensions as this brings different meanings and interpretations of dwelling in transition. It also explores the differences between scenarios and narrative approaches developed scientifically under the framework of

IPCC reports and the personal narratives (or stories) that are based on people's unique experiences of living with climate changes and extreme weather events.

In section 2.2, the study is focused on the literature around the impacts of a changing climate, flood disaster and its post-disaster consequences in Malaysia. Here, the exploration is primarily on the history of significant flood disasters that are associated with increases in global warming and seasonal atmospheric flow during the monsoon season. The study elaborates on the causes and consequences of disasters and their impact on society, the urban development and architecture; especially displacement and relocation that has forced people to stay in transit homes temporarily. This section also covers flood disaster management strategies by the National Disaster Management Agency or NADMA Malaysia (formerly known as Malaysia National Security Council - MNSC).

The key aspects discussed in sections 2.1 and 2.2 are brought forward and correlated with the topic of the role of architects in facing the post-flood disaster in section 2.3. The study also outlines the architects' role and contribution during transit time after the flood disaster, in preparing a better resettlement development for affected communities – in section 2.4.

## **2.1 Setting up the context: Climate change impact and flood/ effects of climate change on the built environment**

The Greeks first introduced the word climate or 'klima' as early as the sixth century BC. The Greeks used latitude and longitude as predictors of the climate and also from experience (Hulme, 2011a) to classify the world's five climatic zones. Over the centuries, the definitions of climate have been extended. In the seventeenth and eighteenth centuries, the innovation provided by scientific measuring instruments enabled new ways of understanding the physical and geographical characteristics of climate; along with meteorological measurement as a method of capturing the physicality of climate (Ibid, 2011) (Hulme, 2011a).

The new way of describing climate through quantification of its physical aspects and meteorological measurement introduced in the Northern hemisphere was subsequently recognized and standardized

including the Americas and tropical world in the nineteenth century (Hulme, 2011a). In addition to the use of quantitative measurements, eye-witness descriptions were also utilized since direct sensory and imaginative impacts of the physical climate on the human mind were still seen as 'legitimate registers' (Hulme, 2011a, p. 7). In the year 1900, the Russian-German climatologist, Wladimir Koppen marked the end of the transition from the original Greek classification of climate by formulating The Koppen Climate Classification System, which is still in use today (Peel et al., 2007). The Koppen System categorises the world's climate into five major types: tropical, dry, in-humid middle latitude, continental, and cold climates which is based on the annual and monthly averages of temperature and precipitation.

Climate change is a 'chain reaction' (Sheppard, 2011) that is often related to risk and uncertainty. Climate is defined as 'average weather' that describes the weather patterns and conditions over a long period (IPCC, 2014a). Changes in climate are outlined scientifically as a physical phenomenon that can be observed, qualified and measured (Hulme, 2011a). The physical changes in climate refers to factors such as the incline of the earth's axis, thereby causing global warming phenomena (Malaysian Meteorological Department, 2009). Phenomena such as melting of polar ice sheets (Figure 2.1), sea-level rise and the potential for drought, storms and floods, unpredictable weather within seasons and heatwaves are the critical physical hazards due to global warming (Malaysian Meteorological Department, 2009; Smith, 2011a). There are some notable examples happening in countries across the world, as a consequence of climate change today. This has increased awareness of climate-related threats to economic and social stability such as food, energy, water and quality of life (Smith, 2011a).

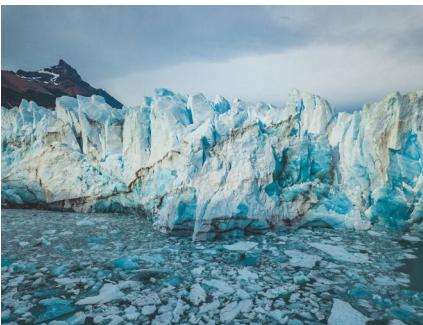


Figure 2.1 Melting glaciers (source: <https://www.ethnoglaciology.com/blog/2019/1/29/melting-glaciers-amp-the-world-economy>)

In 1972, The United Nations Conference on Human Environment first raised the climate change issue in the Stockholm Declaration, which subsequently led to the First World Climate Conference in 1979 in Geneva. The conference concluded that greenhouse gas (GHG) effects from an increased build-up of carbon dioxide in the atmosphere demand urgent action. The intergovernmental conferences focusing on climate change with increasing scientific evidence were held for 11 years, before the IPCC First Assessment Report was released in 1990 and the conference which followed, the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, in 1992 (known as the 'Earth Summit'), formally established the United Nations Framework Convention on Climate Change (UNFCCC). The rise of average

global temperatures was discovered to have increased by 0.5 degrees Celsius in the 20<sup>th</sup> Century. The issue required active measures to halt the rising greenhouse gas emissions, preventing severe global warming in the future (Butler et al., 2011). Five years later, in an international commitment to reduce GHGs, the Kyoto Protocol was adopted during the Conference of the Parties (COP-3) in 1997.

The IPCC has provided five Assessment Reports. The first was in 1990, followed by 1995, 2001, 2007 and 2014, as well as a series of Special and Methodology Reports.<sup>10</sup> These were the results of input from hundreds of authors, which drew on the work contributed by thousands of researchers and expert reviewers worldwide (IPCC, 2018b; Schulte-Uebbing et al., 2015). Throughout this period, the reports have covered various aspects of climate change and its impacts, adaptations, and mitigations.

### 2.1.1 Climate risk and uncertainty

The IPCC scientific assessments have helped to establish climate change as a global phenomenon (IPCC, 2013; IPCC (SRES), 2007). Based on the observed climate change effects, the latest 2014 IPCC Assessment Report (IPCC AR5) projected that the world would experience more extreme adverse climate change effects that may consequently take place much earlier than initially thought. The IPCC predicted that the annual temperature would increase by less than 10 per cent by 2030 and approximately 20 to 30 per cent by 2070 (IPCC (SRES), 2007). Thus, the increased temperature phenomenon leads to sea-level rise, floods and more extreme weather (Sheppard, 2011). Moreover, the effect of a rise in global sea level on the tropical region, including Malaysia, is predicted to be as much as 20-50cm by 2070 (IPCC (SRES), 2007).

The IPCC reports observed climate impacts through six categories, which include health, livelihoods, and poverty. Changes in weather and climate have influenced livelihoods negatively (IPCC, 2014b).

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<sup>10</sup> The IPCC reports by the UNFCCC provide governments at all levels with scientific information to be used to develop climate policies. It gathers key information and input into international climate change negotiations. There are three types of reports prepared comprehensively by the IPCC. 1) The Assessment Reports is the main publication that describes the knowledge on climate change, its causes, potential impacts and response options. It consists of Synthesis Reports and Working Group Reports. 2) The Special Reports is an assessment on specific issues prepared within the assessment cycle and 3) The Methodology Reports provide practical guidelines for the preparation of GHG inventories (IPCC, 2019).



As highlighted in the IPCC AR5 (2014b), floods have happened repeatedly leading to unceasing and exacerbated vulnerability in some parts of the world. For example, in the Mekong region of Cambodia, previous floods have disclosed problems such as 'lack of access to alternative livelihoods, difficulty in maintaining an existing livelihood and household debts leading to migration' (IPCC, 2014b, p. 1349). Moreover, people living in flood-prone areas were observed to be manifesting mental disorders and post-traumatic stress syndrome, which were also linked to age and gender factors (IPCC, 2014b).

Besides changes in natural resources, the effects of climate change have been significantly associated with human interventions or also known as the Anthropocene. It is a term increasingly used to define the 'overwhelming impact of human activity on the planet' adopted across academia (Chua and Fair, 2019). The Anthropocene discourse has challenged the assumed nature and culture divide and it is still debatable. Dipesh Chakrabarty's *The climate history: Four Theses*, engaged with the idea of the concept of the Anthropocene has become a key starting point for rethinking the humanities in the era of anthropogenic climate change (Cooper, 2014). He argues that humans have become the dominant geophysical force in shaping the Earth systems, however, the conventional humanistic distinction between human culture and nature has diminished. The world is not just a passive backdrop for human agency but 'human inheres in the functioning of Earth systems and has demonstrated a substantial capacity to disrupt that functioning' (Chakrabarty, 2012). Chakrabarty proposed four related arguments, which are 'the collapse of a number of long-held, anthropocentric assumptions about the relationship between humanity and the planet, about the history of modernity, and about history as discipline, (Hoglund, 2020, p.2).

Ethnographic research into the effects of, responses to, and understandings of climate change constitute some of the earliest anthropological engagements with the Anthropocene. Anthropogenic climate change identifies humans as the factor or agent of change in the natural world that increases the greenhouse gas concentrations. As observed for the past 50 years, studies by the Malaysian Meteorological Department (2009) reveal that physical changes as a single natural forcing factor in itself is not able to 'produce' the warming alone. Rich qualitative research in small-scale societies, that is critically threatened by climate change impacts, such as low-lying island states, provides insights of how anthropogenic phenomena is perceived, experienced and conceptualized

in specific things. Consequently, it expressed ‘the need to examine its social and cultural dimensions, rather than approaching it as a purely natural scientific concern’ (Chua and Fair, 2019, p.4), this was also being highlighted by Hulme (2011a), as climate change is an ‘idea’ that brings the meaning beyond the physicality of weather and is interconnected with human experiences and ways of living, which this study elaborates on more in section 2.1.2. Global warming emerges due to the combination of both physical (or natural) and anthropogenic forcing factors. The integration of changes in physical climate with human action are aggregated across the world, thus affecting environmental scenarios (Hulme, 2011a). Carbon emissions from activities such as the burning of fossil fuels (coal and gas), deforestation for agriculture or livestock, and transport are among the significant examples of anthropogenic impacts (Malaysian Meteorological Department, 2009). The effects from anthropogenic greenhouse gases in the atmosphere have contributed to the intensity of rainfall and disrupted weather patterns and resulting in severe flooding in many parts of the world (Allan, 2011; Biello, 2011; Pall et al., 2011).

However, future climate scenarios are both global and ‘unforeseen’ (Tyszczuk, 2011). While experts and policymakers are increasingly concerned about the potential consequences of catastrophic climate change (Devine-Wright, 2005), the public or local people remain unaware (Meerah et al., 2010). However, the impact of climate change is repeatedly being demonstrated, such as floods, severe haze<sup>11</sup> and landslides, storms, droughts, and heatwaves (Othman, 2011) (Figure 2.2). These extreme weather events that occur at the regional level are more tangible and affect people’s emotional experience. As Jasanoff (2010) expressed, that people will immediately react and act defensively to threats that affect their personal value.



Figure 2.2 The visibility of the Petronas Twin Towers (KLCC) was affected due to haze. This picture was taken at 5pm, 21<sup>st</sup> September 2019 with the Air Pollution Index (API) recorded a reading of 156, which is considered unhealthy. (Source: <https://www.utusanborneo.com.my/2019/09/22/kronologi-jerebu-di-malaysia>)

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<sup>11</sup> The El Nino is an abnormal weather pattern that is caused by increased temperature in local climate. Throughout this period, the unusual hotter and dry weather weakens the trade wind and causes haze, which accumulation of dust and small particles in relatively dry air. The situation can become worse as a result of bushfires or forest fires that further exposed the area to severe haze (critical level of air pollution).

Further to the issue of anthropogenic global warming that emerged during the 1980s, the numbers of climate-related disasters are rapidly increasing. Worldwide, the rise of sea-level especially at the low-lying areas is becoming a significant threat (Nicholls, 2011). According to the report by the Centre for Research on Epidemiology of Disaster - Emergency Events Database (CRED EM-DAT), climate-related and geophysical<sup>12</sup> disasters between the years 1998 to 2017 caused 1.3million deaths and resulted in 4.4 billion people displaced, made homeless, or in need of emergency assistance (EM-DAT, 2018). CRED reported that the majority of fatalities were caused by geophysical events, such as earthquakes and tsunamis which only covers around 9% of all disasters (Figure 2.3); while the remaining 91% were caused by climate-related disaster including floods, storms, droughts, heatwaves and other extreme weather events (Figure 2.4) (EM-DAT, 2018). Furthermore, more than two-thirds of the world's largest and highly populated cities are coastal

Number of disasters by major category per year 1998-2017

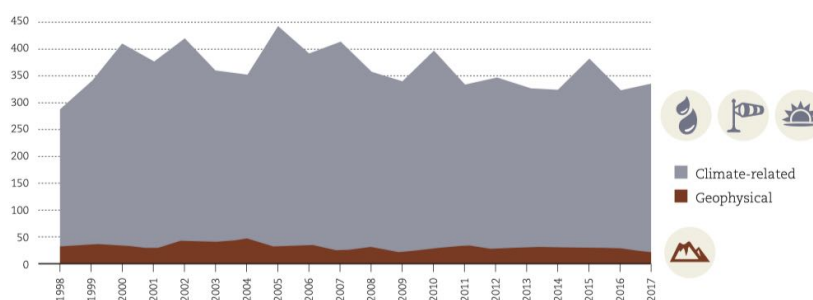


Figure 2.3 Numbers of disasters by major category per year 1998 to 2017 (Source: CRES EM-DAT, 2018)

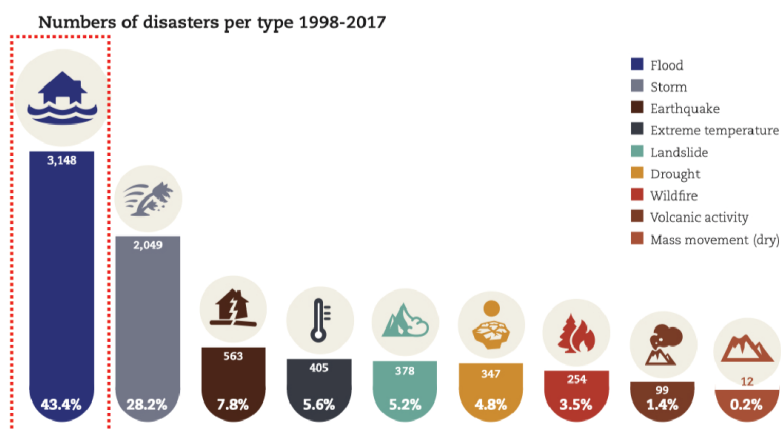


Figure 2.4 Numbers of disasters based on types 1998 – 2017. Flood was the frequent disaster that happened within 20 years of observations (Source: CRES EM-DAT, 2018).

<sup>12</sup> Refer to section 2.2

delta cities that are faced with increased flood risks due to changing climates (Evans et al., 2012).

As flood frequency is uncertain as it changes over time, floods become one of the primary problems highlighted in the IPCC assessment reports concerning the effect of climate change particularly in coastal and low-lying areas (Wong P.P. et al., 2014). In South and Southeast Asia, including Malaysia, it is expected that approximately one million people living along the coastal area will likely be at risk from flooding and lead to displacements, due to projected sea-level rises (IPCC, 2014b, p. 1332). The anticipated impacts of sea-level rise also pose some significant difficulties for buildings and the built environment. If the future climate trends continue as predicted by the Malaysian Meteorological Department (2009), there will be a growing number of the population as well as buildings of all types that are threatened by flooding events in the future, especially buildings with high residential occupancy. Additionally, flooding caused by the impacts of climate change is described as 'difficult to tease apart from human-related drivers' (Wong P.P. et al., 2014, p. 386). The flood disaster and its consequences for the flood-affected communities and architecture in Malaysia will be explored further in Section 2.2 and 2.3.

### 2.1.2 Cultural dimension of climate change impacts

Responding to climate change is about becoming accustomed to and adjusting to risks. The risk is either in reaction to or in anticipation of changes arising from changing weather and climate. Research and policy on adaptation and mitigation have focused mainly on and often referred to the physical aspects of climate change that is mostly quantifiable, and therefore 'conventionally included in policy analyses' (Adger et al., 2012). Although there are great concerns by scientists and specialists on climate change and its impacts, there are still missing or 'almost entirely absent' voices in the scenarios of the IPCC and the UNFCCC from the social sciences, as well as the arts and humanities (Smith, 2011b; Tyszczuk and Smith, 2018). The study agrees that the cultural dimensions of climate change merit a substantial place within climate research. Hoffman explicitly described these concerns in his video, 'Climate change as culture war' (Andrew Hoffman, 2012) and his book, 'How Culture Shapes The Climate Change' (2015).

In understanding the reason why cultural aspects have not been incorporated into climate change analyses and policies, Adger et al. (2012)

argue that one of the reasons is the differences of methods in use. Studying culture through approaches such as ethnography, fieldwork and participant observation, as well as the data generated from these methods are often more inclined to be qualitative. Additionally, Adger et al. claim that 'these methods do not sit comfortably with the quantitative approaches prevalent in other social and natural science in climate change' (2012, p. 112). In an article related to the cultural politics of climate change, Smith expressed that the IPCC process may have set out as one of a highly committed scientific research body, however, it has failed to incorporate the arts, humanities and social sciences in its process in a meaningful way. This is all the more surprising given that the process of exploring the consequences of climate change and the varied responses to human and nature systems in the future rely very much on scenarios and the imagination (Smith, 2013, p. 248). Smith writes,

*'The IPCC process represents one of the most ambitious attempts at global peer review of a specific set of questions and draws together a very broad body of scientific research. The panel's reports summarize an extraordinary body of intellectual achievement. However, even that process is limited by its failure to integrate adequately the social sciences, arts, and humanities with practical politics. This is all the more surprising given how heavily the processes of the IPCC, as well as of the UNFCCC rely on 'scenarios', and hence involve acts of imagination about possible futures in a human as well as a natural system.'*

In the context of climate change, Adger et al. (2012) defined culture as the 'symbols' (consisting of non-material and material aspects), which express meaning such as beliefs, rituals, art, and stories that generate collective perspectives and behaviours. Hulme (2011a) points out that 'climate change has become an idea that travels beyond its origins in the natural sciences', that is beyond scientific description such as in the physicality of weather or climate. Climate is an 'idea', which intervenes, establishes and interrelates between the human experiences of weather and cultural ways of living that have been developed and adjusted, in order to accommodate this experience of climate. A study of climate thus has to consider other aspects that people or specialists may not be able to notice.

Hulme (2017) has highlighted the idea of climate that emerges in innumerable ways, in which cultures and weather are re-shaping and changing mutually with each other. This climate idea is closely related to

time and place. He points out that the social science problem relevant to climate change is 'wicked'. Wickedness is understood here as 'a way of describing problems of mind-bending complexity, characterized by contradictory certitudes and thus defying elegant, consensual solutions' (Brown et al., 2010). Wickedness also refers to a problem situation that is distinguished from a tame or benign problem; it thus requires an on-going understanding and resolution over time (Rittel and Webber, 1973).

Interestingly, Fleming and Jankovic (2011) argue that climate performs as both a statistical index and agency. As a statistical index, climate works in connection to the quantitative and instrumental understandings of the weather and atmosphere. Meanwhile, as an agency, the climate is often defined rather as 'what it does than what it is' (Fleming and Jonkovic, 2011, p. 2) in a wide range of connections and outcomes between physical and human. Therefore, as the agency in a specific context of social life, 'climate has helped translate matters of concern into matters of fact' (Fleming and Jonkovic, 2011, p. 2). The significance of what Fleming and Jonkovic highlighted about climate as a statistical index and climate as an agency, was also emphasized by Hulme (2015) as essential to understanding the influence of climate in social-cultural life. Furthermore, the distinction between these approaches is essential in manifesting the imaginative and material nature of climate (Hulme, 2015).

Culture is vital to understanding people's responses and concerns about the phenomenon of climate change, through the dimension of both mitigation and adaptation (Adger et al., 2012). The relationships between culture and climate 'appear everywhere in daily life' (Hulme, 2015, p. 1). For example, in daily conversations such as in describing the current atmosphere, modes of prediction, memories of past climatic extreme, and expression of feelings. Culture is often attached closely to places or physical space and local climates. The impacts of climate change are also altering or influencing changes in local culture and communities. People and societies have adapted to and dealt with climate throughout history - including climate variability and extremes, with different degree of success. Often, people have found these situations undesirable, unpleasant and perceived them as a loss (Adger et al., 2012). As Hulme (2011, p. xxiv) paraphrasing John F Kennedy;

*'We need to ask not what we can do for climate change, but to ask what climate change can do for us? [...] Use climate change both as a magnifying glass and as a mirror; As a magnifier, to*

*focus our attention on the long-term implications of short-term choices in the context of material realities and social values; and as a mirror to attend more closely to what we really want to achieve for ourselves and humanity.'*

Climate change impacts are expected to affect cultures in multiple ways. Impacts such as flooding or coastal inundation, as well as from the action of adaptation or mitigation strategies, that have resulted in displacement and losing access to places, will have significant consequences on culture (Adger et al., 2012).

### 2.1.3 Climate scenarios, imagination and narratives

Moss et al. (2010) stated that 'scenarios' were initially used in military planning and gaming. The usage later was extended into strategic planning in businesses and other organization in the early 1960s (Moss et al., 2010). Decision-makers have used scenarios to evaluate long-term implications of investment and other strategic measures in their organisations. In climate change research, the IPCC (2018c) highlighted that scenarios were a tool to analyse situations in which consequences are uncertain and unforeseen. Nevertheless, working with scenarios is 'not to predict the future but to better understand uncertainties and alternative futures' (Girod et al., 2009; Moss et al., 2010). It is used to consider possible options or decisions in responding to a broad range of possible futures projected through the scenarios (IPCC, 2018c; Moss et al., 2010). The research community develops and uses scenarios 'to improve their understanding of the complex interactions between climate system, ecosystems, and human activities and conditions ' (Moss et al., 2010, p. 747)

There are four types of scenarios<sup>13</sup> used in climate research and assessment (IPCC, 2018c; Moss et al., 2010). The IPCC relies heavily on both emission and climate scenarios as a central component in its climate research and assessment (IPCC, 2018c; Tyszczuk and Smith, 2018). Nevertheless, the other types of scenarios, which are environmental scenarios and vulnerability scenarios, are also prominent to support the information produced in the IPCC reports. Since 1990, the IPCC has

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<sup>13</sup> The four types of scenarios in the IPCC climate change research and assessment are 1) Emission scenarios, 2) Climate scenarios, 3) Environmental scenarios, 4) Vulnerability scenarios. Narratives also refers as storylines used as the basis of quantitative analysis (IPCC, 2018c; Moss et al., 2010).

undertaken a process for developing emissions scenarios, which has changed significantly over time, to support the research.<sup>14</sup> The changes according to Girod et al. (2009) includes titles, classification, assumptions, and methods.

The IPCC's emissions scenarios were intended to guide scientific studies and investigations; however, they are also suggested as the basis for broader research analyses of climate change as well as other environmental problems (IPCC, 2000 p.iiv, Girod, 2009). Consequently, the emission scenarios have been underpinning scientific studies as well as being regularly referred to by the political and societal discourse on climate change.

IPCC emission scenarios, however, have recently been revised and replaced with the Representative Concentration Pathways (RCPs) that are based on radiative forcing levels and paired with Shared Socioeconomic Pathways (SSPs) (Table 2.1). The RCPs and SSPs are designed together to meet 'the needs of the impacts, adaptation, and vulnerability (IAV) communities, as well as, enabling them to couple alternative socioeconomic scenarios (five alternatives) with the climate scenarios developed using RCPs to explore the socioeconomic challenges to climate mitigation and adaptation' (Hayhoe et al., 2017, p. 137). The use of scenarios is continued in the latest research on climate change by the IPCC, which is the AR5. Here, the scenarios are used to investigate the potential outcomes of anthropogenic climate change through the construction of plausible trajectories of different aspects of the future. Thus, scenarios represent numbers of driving forces, incorporating the impacts, processes and potential responses.

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<sup>14</sup> The First IPCC's Emission Scenarios was known as Scenario A (*SA90*) developed in 1990 during FAR, which set 4 emissions pathways including 'business as usual' and three policy scenarios. Two years later, the IPCC emission scenarios evolution, called *IPCC Scenarios (IS92)* was produced and used in SAR. In the year 2000, the IPCC released a new generation of emission scenarios projections, collectively referred to as the *Special Report on Emissions Scenarios (SRES)*. The *SRES* were used in two consecutive Assessment Reports - TAR and AR4. The IPCC had responded to the criticism on the emission scenarios by acknowledging the need of new scenarios known as *Representative Concentrations Pathways (RCPs)* and paired with *Shared Socioeconomics Pathways (SSPs)*. Nevertheless, the RCPs was not emission scenarios but is a radiative forcing scenarios (Hayhoe et al., 2017).



	<b>Scenarios &amp; Types</b>	<b>Scenario / Pathways Alternatives</b>	<b>Assessment report published</b>
1990	<b>IPCC Scenario A (SA90)</b> <i>Emission-based</i>	<i>'Business as usual' &amp; Three policy scenarios</i>	FAR (1990)
1992	<b>IPCC Scenarios (IS92)</b> <i>Emission-based</i>	A, B, C, D, E, F	SAR (1992)
2000	<b>Special Report on Emission Scenarios (SRES)</b> <i>Emission-based</i>	A1, A2, B1, B2	TAR (2000)
			AR4 (2007)
2010	<b>Representative Concentration Pathways (RCPs)</b> <i>Radiative forcing-based</i>	RCP8.5, RCP 6, RCP4.5, RCP3-PD	AR5 (2014)
	<b>Shared Socioeconomic Pathways (SSPs)</b> -	SSP1 (Sustainability), SSP2 (Middle of the Road), SSP3 (Regional Rivalry), SSP4 (Inequality), SSP5 (Fossil-fueled Development)	

Table 2.1 Development of the IPCC scenarios series from 1990 until 2010. The first three were emission-based scenarios; while RCPs was radiative forcing-based scenarios and developed parallel with the SSPs.

Although the scientifically-based reports confirm the importance of the IPCC as a 'remarkable intellectual achievement' (Smith, 2013), working with scenarios necessitates the involvement to imagine possible futures related to human and natural systems. Therefore, this provokes the question of how far these scenarios can fit into the real situation on the ground? Also, how can society prepare themselves for both practically and imaginatively for these uncertainties?

In order to understand and investigate the obstacle of anthropogenic climate change in culture and society, Yusoff and Gabrys suggested an exploration through 'imagination', assumed as 'a way of seeing, sensing, thinking and dreaming the formation of knowledge' (2011a, p. 516) through two distinct schools of thought. Firstly, imagination as an entwined relational space that is knowledgeable by both the subjects and object. Secondly, 'imagination as a mediator between the positivist world and the human mind' (2011a, p. 516). Both ways of thinking designate human capability in framing environmental scenarios through time and space and especially in bringing them into actuality.

### a) The structure of collective imagination

The word *imaginary* refers to 'existing only in imagination'; while the word *imagination* refers to 'the power of reproducing images stored in the memory under the suggestion of associated images (reproductive imagination) or of recombining former experiences in the creation of new images directed at a specific goal or aiding in the solution of problems (creative imagination)' (The American Heritage Idioms Dictionary, 2019).

The imaginary is common to culture and cultural beliefs, meanings, and models in anthropology and cultural studies. Several philosophers and social theorists such as Castoriadis (1987), Anderson (1991), Taylor (2002) have explored the imaginary of states, nations or ruling classes (Evans et al., 2012) that have underpinned the rise of Western modernity. Although this study focuses on Malaysia, these works are considered to be part of the early reference or precedent for the research, which has searched out the meanings of imaginary and narrative - individually and collectively - and across different cultures that leads to broader questions around future ways of living with climate change uncertainty.

Yusoff and Gabrys (2011a) have classified the imagination into three distinct imaginative framings of the new culture of climate change. Firstly, is the framing on the 'futurity of climate change' (Yusoff and Gabrys, 2011a, p. 2), that incorporate the arts and imaging techniques that are associated with the making of narratives or scenarios and plausible contingency plans that project to and from uncertain futures (Yusoff and Gabrys, 2011a). In this setting, climate change is constructed as an exterior element to society therefore, as an environmental problem rather than a social problem. It tends to have visionary expressions of unfavourable perceptions about living and survival conditions within a changing environment in the future. These often focus on the catastrophic events of climate change by demonstrating exaggerated destructions at large scales.

In one of his books related to the environmental imagination, Lawrence Buell argued that this type of framing reveals the most significant threat that is perceived, not only as of the threats themselves but also the public perception of them (Buell, 1996). It also draws a constant reminder of the discomfoting situations in scenarios of climate outcomes such as what is shown in the illustrations of the palm tree and melted glaciers (Figure 2.5) (Bronnimann, 2002), as well as, the genre film

*“The Day After Tomorrow”* (Figure 2.6) (2012). Although the film has been criticised due to its ‘fright propaganda that posits the onset of a new ice age in a few days, when in reality it would take decades’ (Travers and Travers, 2004, p. 1), Hart and Leiserowitz (2009) posits that the film played a notable role in the public discourse concerning global climate change. Nevertheless, as previously discussed, researches into the public perceptions had found that climate change is confusing and often misunderstood.

Secondly, climate change is understood through adaptation or adaptive strategies rather than foreseen as a separate entity (Yusoff and Gabrys, 2011a) and it can be embedded within everyday lives and cultural practices. This framing is more of a local scale approach, which requires personal or social action within the realm of climate change. It promotes sustainability within societies, and fosters notions of resilience, participation and interdependence.

North (2010) suggests localisation and being localist as an alternative solution to the new culture of climate change. Localisation is a social movement that creates diverse, interdependent and resilient societies and economies. It promotes a great deal on prioritizing of local production within the vicinity of societies and only opting for goods and services from the international trade when necessary. The key sites of adaptation and intervention focused by the practitioners and researchers in the fields of art, design, architecture, and engineering are said to be at various scales, from the size of the city to the scaled-down unit of home and the community (Yusoff and Gabrys, 2011a). It also addresses climate change’s political and cultural impacts. This framing suggests a ‘continuous approach’ in creative practice projects as it addresses contemporary concerns around climate change. Sea level rise and flood events are also seen to be an inspiration in arts and architecture (Figure 2.7 - 2.11) imaginations. Kearley (1988) highlighted that the culture of becoming ‘A civilisation of the Image’ has increased. Therefore, arts and especially architecture play an important role in thinking through the representation of environmental change.

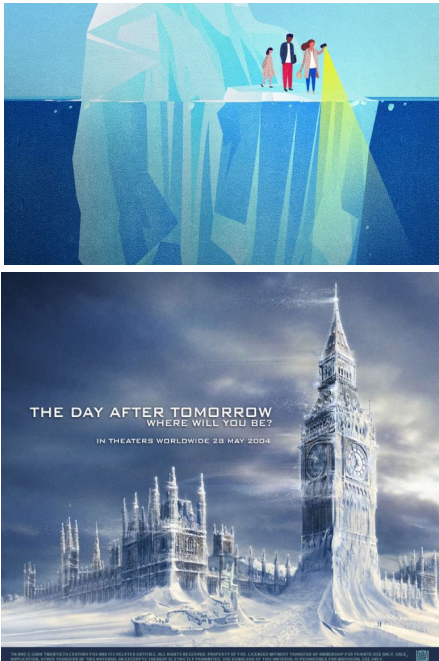


Figure 2.5 An illustration of a family standing on an iceberg due to climate change impact in the article titled, *‘Everything is not going to be okay’: How to live with constant reminders that the Earth is in trouble.* (Source: The Washington Post, 2019).

Figure 2.6 An illustration of London City covered with thick snow that posits the onset of the new ice age in the film *‘The Day After Tomorrow’* (Source: Mail Online, 2017)

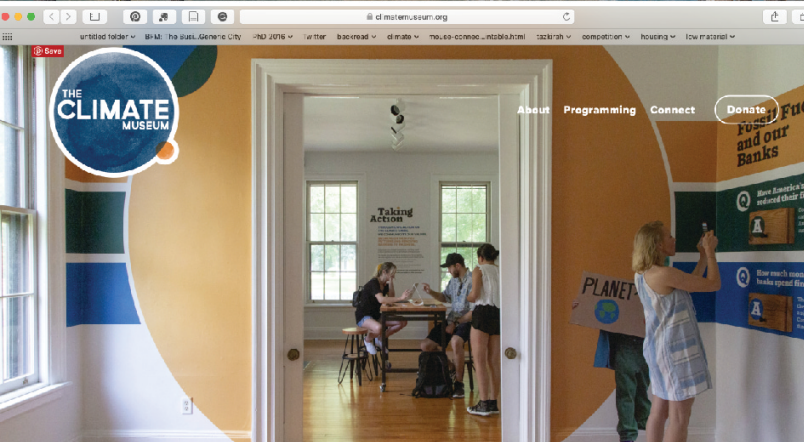
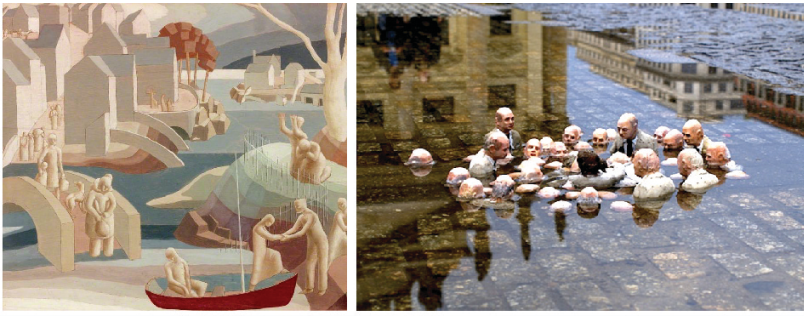


Figure 2.7 (top left) Painting titled 'The Flood' by Flora A P Glover in 1941 (Source: artuk.org)

Figure 2.8 (top right) A tiny sculpture by Isaac Cordal titled, 'Politicians discussing global warming' located in Berlin (Source: www.inhabitat.com, 2014)

Figure 2.9 An art installation during Venice Biennale 2017 by Lorenzo Quinn called, 'Support' - Giant hands emerged from a Venice Canal to raise climate change awareness. (Source: www.vice.com, 2017)

Figure 2.10 The first Climate Museum in the United States dedicated to climate change for the local community (Source: Climatmuseum, 2019)

Figure 2.11 'Climate Signals' - The Climate Museum public art installation of ten solar-powered highway signs by Justice Brice Guarriglia, staged in parks and public spaces across New York City. The signs displayed climate change alerts in five different languages. (Source: Climatmuseum, 2018)

Thirdly, the cultural approach in climate change has seen a critical discourse between climate science practitioners and public society (Yusoff and Gabrys, 2011b). The discourse is possible by considering the social spaces of climate interaction at the science-policy-public interface and by promoting new forms of science co-production of knowledge between different practising communities. The aim is to 'democratise climate change' (Yusoff and Gabrys, 2011b), by presenting the possibilities in practice as well as reimagining the experience of scientific data with diverse publics.

In addition to the imaginative framings mentioned earlier, Hoffman (*Andrew Hoffman, 2012*) proposed three possible 'paths' towards the future climate. The first path is 'The Optimistic Path' which suggests that people do not have to change anything in regard to their worldviews, as it will be tackled by the professional 'players' through strategic planning such as renewable energy and green building. Secondly, is 'The Pessimistic Path' where inhabitants fight to maintain today's worldviews. Finally, 'The Consensus-Based Path', in which people find reason in their acts through an evolved set of worldviews.

#### b) The significance of the social imaginary

In his book *'The Imaginary Institution of Society'*, Castoriadis (1987 p.127) fundamentally defined 'imaginary' as 'the capacity to see in a thing what it is not to see it other than it is'. 'The imaginary' is positively appreciated by Castoriadis (1998) as a potential means of 'freedom' that eventually leads to creativity at the individual and society level. Strauss (2006) explains that Castoriadis described the social-imaginary as a 'cultural ethos'. Castoriadis uses 'the concept of imaginary to describe how societies tend to construct mythologies around social orders and means of production' (Evans et al., 2012).

Anderson (1991) shares the same views with Castoriadis which emphasised on the creative and constructive aspects of imaginative creations. However, they differ in crucial matters as Strauss (2006) points out that Castoriadis believed that the, 'social imaginary is the central world view associated with a particular group, setting off one group from another'. In contrast, Anderson's approach focuses on a concept that has extended beyond the borders of any specific group due to people's participation in similar kinds of practices.

Drawing on the pioneering work of Anderson (1991) in *'Imagined Communities'*, Taylor (2002) sets out the idea of the social imaginary as 'the way a given people imagine their collective social life'. Taylor (2002) highlights that 'social imaginary is something more than an immediate practical understanding of how to do particular things'; nevertheless, it involves a form of understanding that has a broader grasp of both, history and social existence. It is a 'complex, unstructured and not fully articulated in understanding the whole situation, within which particular features of the world become evident' (Taylor, 2002). Hence, this has raised broader questions around adapting and 'carrying out collective practices that are constitutive of people's way of life' (Taylor, 2002).

For Castoriadis, Anderson, and Taylor, the 'imaginary' focuses as something positive or an imaginative creation of the society and individual. However, Strauss (2006) highlighted that Lacan has an opposing view about the imaginary. Lacan (Strauss, 2006) described the 'imaginary' as an illusion that referred to fantasy created in response to a psychological need. Strauss (2006) suggested that Taylor's, Anderson's and Lacan's view of 'imagination' are potentially valuable only if used as a person-centred-methodology to study actual occurrences rather than as an 'abstract cultural subjects'. This person-centred approach acknowledges the importance of learned cultural understanding but 'does not take culture to be a fixed entity assumed to be held in common by a geographically bounded or self-identified group' (Strauss, 2006). Furthermore, this approach encourages a focus on exploring the imaginaries of real people confronting real situations, rather than imaginaries of imagined people. Hence, by studying people in their localized context will help to counter the propensity to see imaginaries as rigid than they are.

#### c) New climate imaginaries / redefining climate imaginaries

While the IPCC have developed scenarios, such as the emission scenarios or RCPs in the IPCC report series, in order to understand the consequences of future climate on people's lives, **stories or narratives from the people who experiencing climate impacts are vital. Input from these people is important in understanding the way people have learnt from the past, have adapted in their present time and are capable of shaping their futures. Stories also help to understand the level of vulnerability that different people are facing, as well as help in imagining future scenarios and conceiving possible interventions between now and then.** In the article *'A New Climate for Society'*, Jasanoff asserts that

the change in climate ‘offers unique challenges and opportunities for interpretative social science’ (2010, p. 233) as it developed a variable understanding of people’s responsibility with respect to the environment. **Scientific assessments such as the IPCC (IPCC, 2013; IPCC (SRES), 2007) have contributed to identifying climate change as a global phenomenon; but in the process, it has also resulted in the separation of climate knowledge from its cultural meanings.**

As outlined in Chapter 1.2, there is a distinct dissimilarity between scientific and personal narratives of climate change. Scientific narrative produces climate facts that result from a neutral and unemotional observation. Meanwhile, personal narratives gathered from people’s experiences give meaning to their current and future experiences, especially given the complex responses that climate change demands (Jasanoff, 2010). Jasanoff (2010) points out the four levels of interaction; communal, political, spatial and temporal in order to explore the tensions that arise between impersonal and universal imaginaries of climate change. These are projected by science, looking at the normative, subjective and situated imaginations of human actors engaging with nature.

‘Imaginary’ suggests a more exciting form of cognition rather than knowledge of perceivable facts. In this study, the word ‘imaginary’ or ‘architectural imaginary’ refers to the medium that helps to produce ways to navigate the interconnected trajectories of both faculties mentioned, and how it determines opportunities for transformation through design processes and strategies.

*‘Architecture has tended to challenge ways of working, thinking and relating in a given society with the help of history, geographical, and speculative strategies: have things always been done, thought or produced this way? Are things done, thought or produced this way differently in other places? Also, can we imagine other ways in which things could be done, thought, or produced in the future?’ - (Turpin, 2013).*

By having a better understanding and relationship between the individual theoretical frameworks and sciences, architecture as a practice can reconsider its priorities, privileges, and capacities for an inscription within the archive of ‘deep time’ (Turpin, 2013). Through a better understanding of the ‘imaginary’ in this context and person-centred point of view, one of the critical outcomes from the analysis will be to offer

insights to architects into the way their practices have or can encounter the post-disaster transit time that will have an impact on improving resettlement. Furthermore, it raises important questions on how this encounter with imagination of climate-changed futures allows architects to transform, design or architectural practice for the future.

In reframing and conveying the climate change impact such as flood disaster as a local problem at human-centric level (fundamental level), Woodall suggested four ways to deliver change for architects; (1) Acknowledge impact and responsibility, (2) Reframe the extent of architectural influence, (3) Centering sustainability issues, (4) Engage clients and consultants together in the projects. Architects are responsible at a more fundamental level for informing clients about the environmental effects of projects. During the design phase, clearer and more structured discussions with advisors can lead to a greater collective awareness of a design proposition.

## **2.2 Floods history in Malaysia**

Understanding the context of floods in Malaysia is important in giving a coherent overview of the physical, socio-economic and cultural settings of the place and its relation to the study of transit time and transit home in post-disaster recovery. Exploring the history of extreme monsoon flood events and post-flood disaster responses helps to clarify the significance of the transition period for temporary homes, as a contribution to the development of resettlement practices for disaster survivors.

Malaysia is a tropical country (located in Southeast Asia) with hot temperatures and high relative humidity throughout the year. It comprises of thirteen states and three federal territories separated into two parts, which are the Peninsular Malaysia and East Malaysia; it covers an area of 329,750sqkm (Malaysian Meteorological Department, 2012). The average precipitation is between 2000mm to 4000mm with the temperature ranging between 26 degrees to 32 degrees all over the region (Shah et al., 2017). Peninsular Malaysia is geographically divided into west and east by a central mountain range called Banjaran Titiwangsa.

Malaysia is indirectly affected by calamities such as earthquakes, volcanic eruptions, hurricanes, tornados and typhoons. However, there



are two types of disaster highlighted in Malaysia, which are, geological disaster and hydro-meteorological disasters (Pereira et al., 2010). Geological disaster is correlated to the onset of economic growth and expansion of urban areas particularly into hilly terrains. As a result, landslides are an example of a disaster that have become common and affecting a large number of the population in Malaysia. The latter type of disaster (hydro-meteorological) is even more significant to the country. Two notable water-related problems are causing adverse impacts, which are, flood (excess water) and droughts (water shortage) (Pereira et al., 2010; Shah et al., 2017). Between these two major causes, the flood is perhaps the main significant natural hazard in Malaysia. Floods are considered to be crucial because of their population impacts, frequency, duration, area reached and damages to the socio-economic structure.

There are two types of flood commonly occurring in Malaysia, which are flash floods and seasonal flood or monsoon floods. Flash floods usually happen with little or without any warning after heavy rain. Pereira et al (2010) points out that the contributing factors of flash-flooding are because of (1) increased impermeability due to an increase in the built-up areas (2) increased accelerated erosion from exposed surfaces resulting in sedimentation of rivers and streams, which subsequently cause flash-floods along the flat low-lying river channels (3) poor maintenance of drainage facilities in built-up areas. Meanwhile, monsoon floods usually happen during high season rainfall caused by the Northeast monsoon winds (between November to March) and the Southeast monsoon winds (between May to September), thus, influencing the amount of precipitation in Malaysia. Additionally, the difference between both the flash flood and monsoon flood relies on 'the time taken by the river flow to go back to its normal position' (Sani G. D/iya et al., 2014). Monsoon seasons are also known as the rainy season or '*musim tengkujuh*' (*tengkujuh* season) among the locals (Ishak et al., 2014).

There are a total of 2,986 river basins in Malaysia, and 189 among them are main river basins (more than 80km<sup>2</sup>) recorded throughout Malaysia. Generally, 74 of the main river basins (40%) are in Peninsular Malaysia (figure 14), 75 are in Sabah, and the remaining 40 main river basins are in Sarawak (DID, 2017). Malaysian people are historically categorized as the riverine people as the early settlements grew on the river banks (Chan, 1995). As mentioned earlier in Chapter 1.1, this study focuses on major monsoon flood disaster, which is one of the main impacts due to changing in climate in Malaysia. Flood scenarios have long been recorded in history. Loi (1996) underlined that it is estimated that

some 29,000sqkm or 9 per cent of the total land area of Malaysia were floods prone in the year 1996, hence affecting nearly 22 per cent or 3.5 million people (Mohd Taib et al., 2016; Sarkar et al., 2014; Shah et al., 2017) (Figure 2.12 and 2.13).

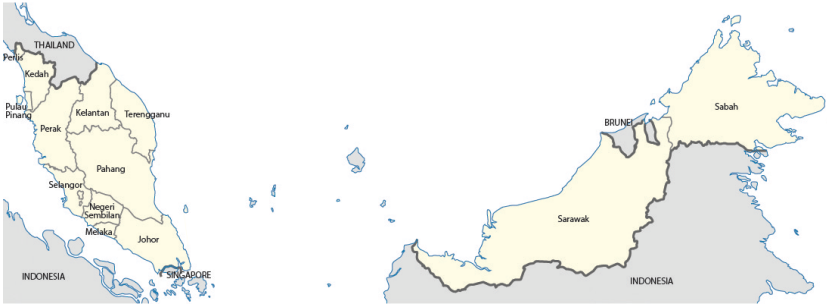
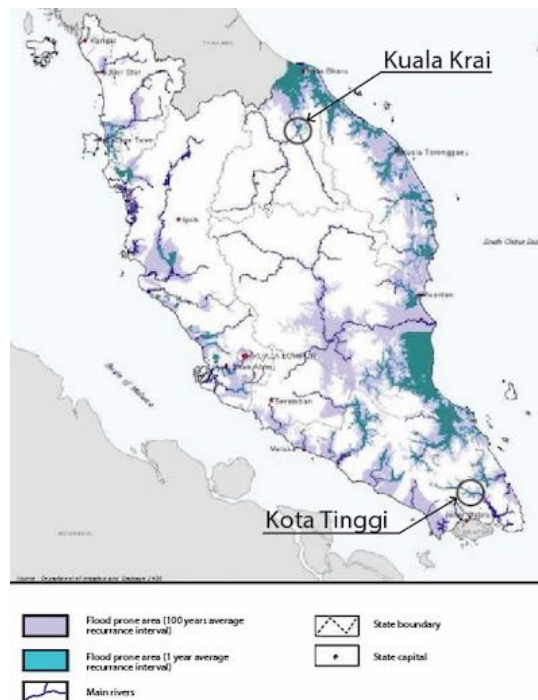


Figure 2.12 Map of Malaysia; consists of 2 parts, which are Peninsular Malaysia and East Malaysia (States of Sabah and Sarawak).

Figure 2.13 Flood prone area map of Peninsular Malaysia. Places highlighted (Kota Tinggi and Kuala Krai) are the case studies and fieldwork of this research. (Source: DID, 2017 and edited by Nor Izura T.)



The flood disaster in Malaysia has been recorded since 1886 (Ishak et al., 2014). Since then, the country has experienced several major floods within Peninsular Malaysia (categorized as Disaster Level 3 - refer to section 2.3.2) in the year 1926, 1967, 1971, 2000, 2004 (Loi, 1996; Shah et al., 2017), then followed by the consecutive flood in 2006<sup>15</sup> and 2007 (Julien, 2007), 2008, 2010, 2011, 2012 and the latest in 2014, an unprecedented and unanticipated flood event which coincided with the timeframe of this study (Table 2.2). Among the flood disasters occurred between 1926 and 1971, the flood in 1926 was described as the most critical and was described as ‘the mother and father of all floods’ (Gullick, 1994). However, the latest flood disaster in 2014 was the worst

<sup>15</sup> The two latest floods mentioned (consecutive years December 2006 and January 2007, and the 2014 extreme flood event) will be discussed further in Chapter 4 and 5.

Year and references	Property, Material, Crops and other losses (RM & GBP)	No. of deaths	States affected
<b>December, 1926 – January, 1927</b> Flood known as ‘The storm of forest flood’- <i>Chan, 2012</i> ‘The mother and father of all floods’- <i>J.M. Gullick, 1945, p.65</i> ‘Bah Ayer Merah’- <i>Norsyamimi et al, 2014</i>	Thousands of hectares of forest destroyed	NA	Kuala Lumpur, Perak, Pahang, Terengganu, Kelantan, Selangor
<b>2<sup>nd</sup> -6<sup>th</sup> January, 1967</b> <i>Syamimi et al, 2014</i>	RM 251million	NA	Kelantan, Terengganu, Perak, Pahang, Kedah, Perlis, Johor, Pulau Pinang.
<b>January, 1971</b> <i>Syamimi et al, 2014</i>	180,000 people affected USD85 million	61	Pahang, Selangor, Johor, Melaka
<b>2000</b> <i>Chan, 2012</i>	millions	15	Kelantan , Terengganu
<b>December, 2004</b> Asian Tsunami <i>Chan, 2012</i>	millions	68	Northern Peninsular Malaysia
<b>December, 2006 – January, 2007</b> Floods caused by heavy rains <i>Chan, 2012</i>	110,000 people affected USD489 millions	18	Johor
<b>2008</b> Floods caused by heavy rains <i>Chan, 2012</i>	USD21.19 millions	28	Johor
<b>2010</b> Floods caused by heavy rains <i>Chan, 2012</i>	USD8.48 millions (aid alone)	4	Kedah, Perlis
<b>2011 &amp; 2012</b> La Nina (which caused flood)	NA	NA	
<b>December, 2014</b> Flood due to heavy rains during North-East monsoon	USD560 million	24	Kelantan, Terengganu, Johor, Kedah, Perlis, Negeri Sembilan, Pahang, Perak

Table 2.2 Major flood in Malaysia happened between 1886 – 2014 in Peninsular Malaysia. (Source: Syamimi., 2014, Chan., 2012, Sani., 1973)

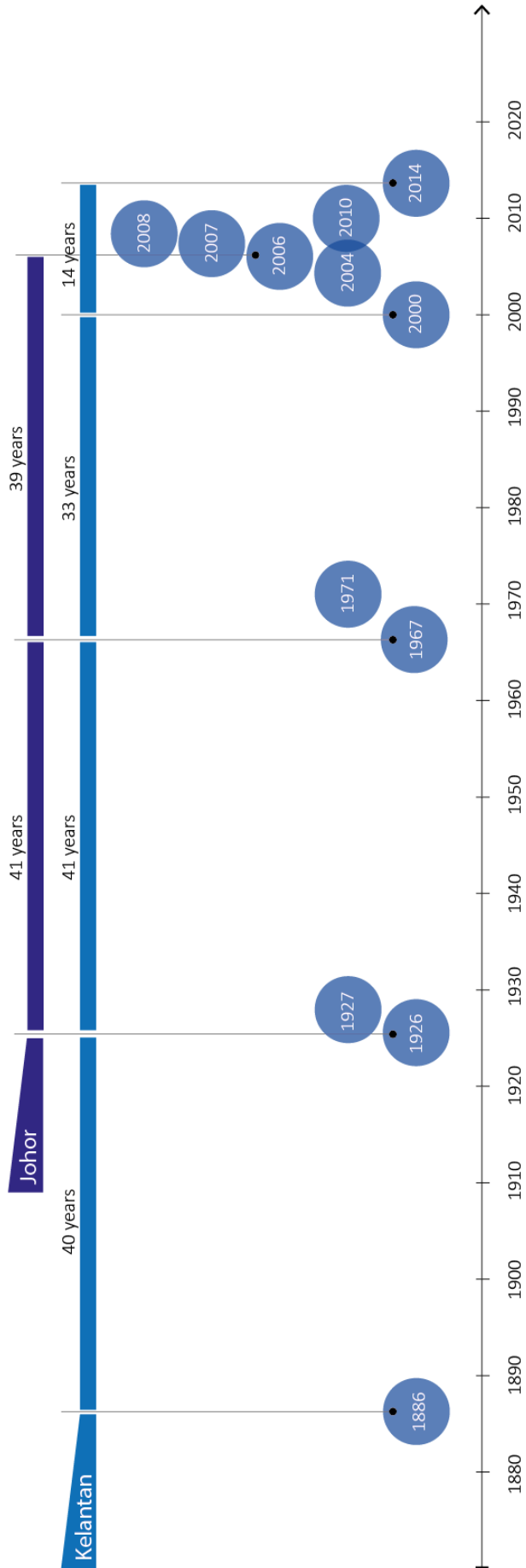


Figure 2.13a The frequency of major flood events in Peninsular Malaysia between 1886 and 2014.

and unpredictable ever recorded. The major floods happened between 1886 and 2014 illustrated in Figure 2.2, shows the frequency of flood events and its interval gap occurred nearly every 35 to 40 years. Nevertheless, the trends have started to change since the year 2000, as major flood events within Peninsular Malaysia have emerged every 2 to 4 years.

Flood is a common phenomenon in Malaysia as it occurs annually, especially during the Northeast seasonal monsoon that brings more rainfall between November to March and accounts for significant losses, both tangible and intangible. The numerous natural factors such as heavy monsoon rainfall, rainstorms and intense convection, as well as other human factors suggests that floods are a common feature in the lives of a significant number of people in Malaysia and an integral part of how they have constructed their communities. People who live in the flood plain areas are well adapted to this scenario and familiar with 'living with floods', and this has indirectly shaped their culture and social life. It is well known that flood brings a negative impact and disadvantages to local residents - affecting their economy, safety, belongings, and damaging infrastructure - but to some of them, it is understood as positive. When the flood happens, people take this chance to enjoy the moment like a kind of 'water festival' rather than see it as a threat (Figure 2.14 and 2.15).

### 2.2.1 Consequences of the major monsoon flood disaster

Generally, flood disasters affect both the individual and whole communities. The consequences of floods depend greatly on the location and extent area of flooding, depth, pace and duration as well as on the vulnerability or value of affected natural and man-made environments (Science, 2018). It is well known that floods have substantial social, economic and environmental consequences for both the individuals and communities with large numbers of people affected directly as well as indirectly. The immediate impacts of flooding include involuntary displacements, loss of human life, loss or damage to properties, loss of livestock, destruction of crops and decline of health conditions. Additionally, the damage of public facilities and infrastructure has caused difficult and slow recovery.



Figure 2.14 Main river basins in Peninsular Malaysia that represent 40 per cent from the total river basins in Malaysia

Figure 2.15 A group of people enjoyed their time played in the flood waters in Kelantan (Source: Spampreneur, 2017)



The traumatic upheavals associated with flood disaster have often left survivors psychologically damaged, with high levels of stress, when forced to leave their homes, and with severe disruptions to normal daily routines. Temporary shelter provided in public places such as community halls, schools and religious buildings post-disaster afford little privacy, are often cramped, with shortages of food, clean water and medical supplies; all contributing to the stress and discomfort. This is especially the case when people were instructed to displace involuntarily and relocate to other places permanently. Although the social impact is

difficult to measure, it is believed that flood disaster has brought severe impacts on people affecting their livelihood. This occurs primarily during the seasonal monsoon flood and in the context of more significant populations, as well as more intensive human-induced activities, including agriculture and expanding industries, and is expected to be more severe in the future. Thus, it has given rise to increase risk; exposure and vulnerability that is expected to cause many people to be displaced from flood-prone areas.

According to the regional climate projections (Malaysian Meteorological Department, 2009), there will be a substantial increase in monthly rainfall over the North East Coastal region and decrease on the West Coast of the Peninsular by the year 2050, involving imagined increases in hydrologic extremes. Floods are thus predicted to be more extreme and communities will be even more vulnerable in the future. These projections have resulted in calls for attention and necessary actions, especially in terms of post-flood disaster responses, which would involve the process of 'reconstructing' local communities that were affected; as first responders to a disaster. Hence, expert input from professions involved in adaptation practices such as architects is needed, but at the same time this input needs to be informed by and integrated with local indigenous knowledge of adaptive strategies and experiences.

### 2.2.2 Local flood wisdom and responses

As flood happens quite often and major flood strikes every several years, communities living in flood plain areas (such as in the riverside *kampung* area) have developed adaptive strategies to deal with floods based on local knowledge, practices, and social arrangements (Isahak, 2017). Chan (2011) states that traditional or local wisdom is the knowledge that people have gained over a long period of time through direct experience. It also provides the community with the 'capacity to anticipate, cope with, resist and recover from flood hazards' (Chan et al., 2014, p. 62).

Traditional knowledge in environmental issues is a complex process as it combines knowledge of practice and belief (Lejano et al., 2013). Lejano et al. identified this traditional or local knowledge as 'dynamic and adaptive, constantly changing while retaining cultural continuity' (Lejano et al., 2013). Local knowledge and methods have been passed down within the communities for centuries - from generation to generation, and they understand them well, as they are used to them.

Adaptations to flood situations drawing on traditional system help them to respond effectively during the flood (Chan et al., 2014), thus equipping them to make appropriate decisions in facing the flood situations based on their local knowledge and experience. Additionally, such valuable knowledge helps to establish a community's 'adaptability, resourcefulness, resilience and recovery' (Chan et al., 2014).

Local wisdom is useful and essential for the communities living in flood plains. However, major external assistance from the government and other organisations is also needed when an extreme flood affects extensive areas in an extended period, causing large-scale losses and damages. The advance system implemented by the government, such as the early flood warning system and evacuation system provided, has saved lives and reduced damages. Nevertheless, Chan et al. (2014) claim that the system is a top-down operation and lacks involvement from the affected community. The irresponsive feedback from the stakeholders is due to lack of knowledge and information about these systems that may result in a weak response to flooding warning.

Armitage et al. (2011) claim that people with local environmental wisdom are highly observant. They have identified three key elements that shape traditional knowledge holders, as good observers of climate change, that is, observing, understanding and making sense of environmental change. In Kuala Krai town in Kelantan, one of the elements initiated by the local community was the *Tangga Krai* (previously known as the Bradley Steps) in the year 1927 (Figure 2.16 and 2.17). The *Tangga Krai*, consists of 81 steps, initially designed to walk down to the river and boats, the main transportations for people who lived nearby (*kampung* and town) to travel to another place. The *Tangga Krai*, is fitted with stick gauges from the top part of the steps to the lowest to allow the locals to monitor the water level of the river. The red colour steps indicate the water level that is at a critical level, to the local community. In this way, and based on hereditary local environmental knowledge on the flood, the people of Kuala Krai were able to anticipate and translate their understanding of flooding, manifest in an important local architectural landmark.<sup>16</sup>

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<sup>16</sup> Refer to section 2.2.4





Figure 2.16 (above) View of the *Tangga Krai* from the ground level. 81 steps use to link people to the river, at the same time function as flood indicators. (Source: Mdkrai, 2018)

Figure 2.17 (below) The water level from the river raised up to the highest level of *Tangga Krai*, gave an alarm warning to the people (Source: Kaihongs, 2004)

### 2.2.3 Architectural responses

The characteristics and form of the traditional *kampung* house have evolved with care and over time and correspond to its function, cultural environment, climate, and social behaviour. Furthermore, the fenceless compound has added to its unique characteristics, indirectly shaping the *kampung* organisation and settings. In a way, the aspect of design and planning, and adaptability of *kampung* people reflects the culture, thus the *kampung* people in general and the Malay people

specifically, are a reflection of the design, the planning and adaptability. Therefore, studying the patterns of settings and activities in the *kampung* will contribute in producing user-oriented resettlement strategies. Davis (1983) states that disasters often act as agents of change as post-disaster ‘forms’ may have been improvised or innovate, in response to the previous disaster that happened.



Figure 2.18 Traditional Malay house is designed portable responding to the local weather and context (Source: Malaymail, 2018)

One of the most identifiable architectural adaptations in response to the local weather and flood is the way houses were built on stilts. This type of house is usually found in the *kampung* area and low plain area, as it is designed to withstand a certain level of flood impact, responding to local climatic conditions and context. Previously, a *kampung* has been commonly associated with the Malay settlements, traditionally established near the river, beach and along the main roads. Some of the Malay on-stilts wooden houses (specially built near/at the flood plain area) were designed as portable (Figure 2.18) as they can be carried and moved to other nearby places (Chan et al., 2014). Some of these houses remain until today. The on-stilts features help to avoid flooding of the interior and also allow room for daily activities as well as parking boats underneath (Figure 2.19) (Aiman, 2018). The house also has its unique characteristic, which enables ‘disassembly and assembly’ of each component of the house if the owner wants to move the house further from its original location (Aiman, 2018). During the flood, the wooden wall panels and platforms are adjustable to allow the water to flow during flooding, hence, reducing the impact of the flood to the house.

Apart from that, the elevated house was designed to give more privacy to the owner and to allow natural ventilation. During the usual seasonal flood, house owners usually stayed and removed their goods to *Rumah Ibu* until the flood receded. *Rumah Ibu* is the main section of the house that is usually built larger and higher than other sections of it (Figure 2.20). Constructing a wooden on-stilt house is uncommon today due to its material cost, hence the change of material to bricks and reinforced concrete. This kind of design approach is less frequently implemented nowadays and houses are mostly built on the ground as the construction costs are cheaper (Pereira et al., 2010).



Figure 2.19 (above) The on-stilts features allow room for daily activities including parking boats underneath the house (Source: Malaysian Timber Council, 2018)

Figure 2.20 (below) The height of the house usually based on the previous major flood that happened, helps to avoid flooding of the interior (Source: Malaymail: 2010)

#### 2.2.4 Flood, in people's beliefs and behaviour.

Flood disaster due to the impact of climate change, which this study is focusing on, is also mentioned in the world's major religions such as Judaism, Christianity, and Islam. The great flood during the time of Prophet Noah (also known as The Noah's Ark), for example, has been told in several religious books such as the Torah, the Bible and the Qur'an (Figure 2.21 & 2.22) (Hulme, 2011a). Hulme (2011a), and Slimak and Dietz (2006) argue that human behaviour is undeniably influenced by religious beliefs and religion; this includes the way people perceive and interact with the physical environment throughout the process of climate change adaptation.



Figure 2.21 The story of Noah's Ark mentioned in the religious books (Source: RoadsideAmerica,2018).

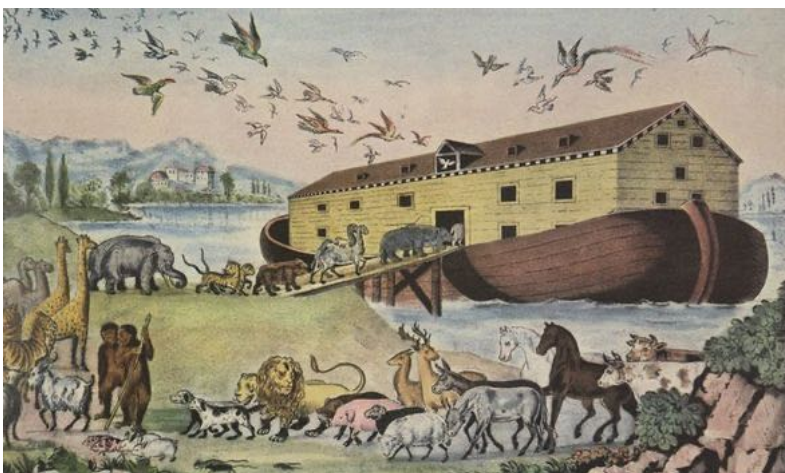


Figure 2.22 Noah's Ark and the flood (Source: Kirkham, 2018)

The story about Noah and the flood disaster is one of the stories in the Qur'an that is very significant to Muslim communities in Malaysia; as flooding frequently occurs in this country (Abidin and Khairuldin, 2018).

Hence, some of the people believe that disasters, such as floods, are always associated with a 'warning' from God about human behaviour that contradicts the teaching of God, or is an expression of the anger of the God (Ghafory-Ashtiany, 2009). Additionally, Muslim scholars (2010) have highlighted that natural disasters occur due to human error and greed as the pursuit of material things, pointing to hills excavated and demolished, where development takes place as they please, or where open burning is rampant as a result of increasing practices of illegal logging. As a result, the ecological systems and the balance of the universe are threatened.

Nevertheless, Ghafory-Ashtiany has further explained that 'no statement by the Prophet Muhammad ever mentioned that disasters are expressions of the wrath of God or the result of disobedience or infidelity'. Instead, Ghafory-Ashtiany discovers that there are 'more references to God's kindness than to His wrath' (2009, p. 219), including the need to prepare for disasters and prevent them from happening. This was also elaborated by Abidin and Khairuldin (2018), who observed that there is much to learn from the Qur'an in this modern time, such as the application of pre-flood management by Noah, including supervision (expertise) and instructions (guidelines to be followed by departments related to disaster management & guidelines for publics (Abidin and Khairuldin, 2018).

### **2.3 Disaster recovery process and displacement**

Environmental changes have threatened livelihoods and many people either struggle to survive or attempt to adapt to the changing environment, while others are forcibly displaced or relocated in order to escape the effects of disaster. Disaster<sup>17</sup> commonly associated with 'tragedy, catastrophe, calamity, devastation' (Aini Mat Said and Fakhru'l-Razi Ahmadun, 2017, p. 1) and vulnerability (Johnson et al., 2006). Disasters are viewed as unexpected and unpredictable events that cause losses such as death, injuries and property damages to a large number of people. Thus, they often result in the movement of people, seeking relief and recovery.

According to the UNHCR, disasters had caused displacement to an average of 27 million people every year between 2008 and 2013 (Ferris, 2017). Research by EM-DAT reveals that climate-related disasters have caused approximately 161 million people to be homeless. Among all

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<sup>17</sup> Refer to section 1.2

disasters listed worldwide, it is recorded that people were highly affected and became homeless due to extreme flood events (Table 2.3).

Natural disasters 1960-2011 worldwide

SUBGROUP	TYPE	No.	%	AFFECTED	HOMELESS	DAMAGE USD
Geophysical	Earthquake	954	8.54	168,370,550	22,663,935	730,852,074
	Volcano	187	1.66	5,231,865	355,790	2,940,348
	Mass. mov dry	46	0.41	27,109	3,981	203,800
Metereological	Storm	3,121	27.66	876,423,403	50,958,889	796,225,545
Hydrological	<b>Flood</b>	<b>3,750</b>	<b>33.32</b>	<b>3,295,628,900</b>	<b>83,062,528</b>	<b>483,418,078</b>
	Mass. mov wet	551	4.88	13,684,910	4,222,888	8,429,998
Climatological	Extreme Temp.	400	3.62	96,565,887	14,340	62,973,419
	Drought	570	5.05	2,059,800,303	20,000	90,134,906
	Wildfire	347	3.08	5,910,667	145,752	49,032,055
Biological	Epidemic	1,247	11.05	23,680,156	0	7
	Insect infestation	82	0.73	2,200	0	230,215
<b>TOTAL</b>		<b>11,282</b>	<b>100.00</b>	<b>6,545,325,950</b>	<b>161,451,103</b>	<b>2,224,440,155</b>

Table 2.3 Number of climate-related disasters by subgroup from the year 1960 to 2011 (Source: EM-DAT)

Housing represents the most significant material loss after the disaster, thus leaving behind people or families in immediate need of relief and shelter. When climate-related disasters such as flood strike, people are usually displaced internally, in their own regions. They are forced to move out from the affected locations and travel immediately to the nearest place of safety. However, the displacement may be temporary or permanent. Temporary displacement commonly requires a short-term stay, until the floods have receded or until the affected place is confirmed safe to stay again. The length of stay could be between days to months. Whereas, permanent displacement as a post-disaster response is usually a long-term process, that requires further inspections, considerations and analysis of how this may affect the people in many ways.

### 2.3.1 Post-disaster recovery process and redevelopment

Post-disaster recovery and redevelopment scene is complicated and complex process. It is correlated with cultural, political, social, technical and legal aspects to determine the appropriate recovery course of action. Generally, the recovery phases require three crucial factors, which are 'multi-sector engagement, a wide range of distinct skills and significant resource commitment' (Gajendran et al., 2013). Nevertheless, the recovery has to take into consideration the urgency of the recovery and displacement issues throughout the process; as Johnson et al. (2006, p. 368) expressed that, 'speed is essential in the relief stage, recovery should not be delayed and prompt permanent reconstruction is obviously

desirable.’ Johnson et al. further explained that recovery issues as the reality of an up-front planning process for such unpredictable scenarios are ‘often totally absent or insufficient, while the decisions made during post-disaster are often impromptu and improvised in a rushed manner. Nevertheless, early planning and imagination of the future is essential to equip the community to be physical and mentally prepared in facing future adverse climate scenarios. Apart from providing physical shelter or housing, it is sensible to consider the occupants’ various needs, including their social and cultural requirements.

In supporting the affected community in a bid to restore a semblance of normality, post-disaster, the process involves large numbers of actors and stakeholders (such as government, private, and humanitarian agencies) incorporated in two categories; which are national stakeholders (as emergency management authority) and international stakeholders (as designated coordination body). However, the involvement of these stakeholders depends on the scale of recovery and relief that is needed at every phase. On the other hand, within the national category itself, the stakeholders are usually divided into three categories (Figure 2.23) and engaged at different level of recovery process, which some are overlaps in terms of timeframes.

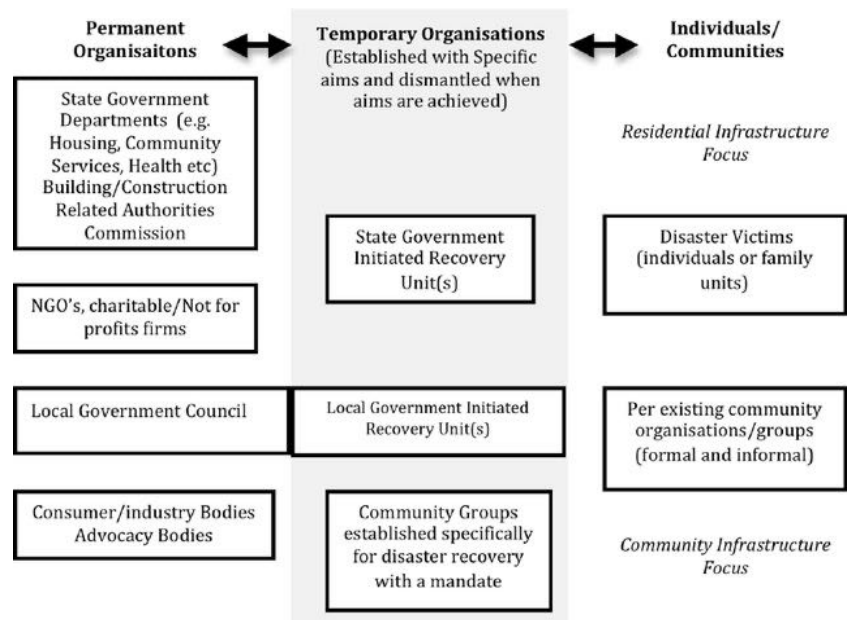


Figure 2.23 A conceptual map of stakeholder organisations for post-disaster reconstruction (Source: Gajendran et al., 2013)

When disaster happens, actors such as those from the humanitarian agencies, should work closely especially with the local actors in order to address the recovery issues and any remaining knowledge gaps. Additionally, in order to avoid duplicating the effort by

the local actors, coordination with all the actors involved is vital (Johnson et al., 2006). The involvement is not just between the government, private agencies and humanitarian activists, but as Archer explains, the local inputs should include contributions from the local researchers and practitioners too. This is because they may understand the situation on the ground better and therefore, are expected to be able to provide practical solutions and essential information through their direct experience.

Post-disaster development covers a lot of aspects. One of the important aspects that needs focusing on is housing resettlement for the affected individuals or families, especially those being displaced and relocated involuntarily. Chan (1995) highlighted that relocation or resettlement is an 'unpopular' option. Nevertheless, the increasing frequency and scale of disaster events happening recently, has resulted in an escalation of displacement along with demands for relocation. This is in spite of understanding that relocation is costly in acquiring alternative locations, and that it may provoke social disruptions and upheaval when people are moved to locations that are unfamiliar to them.

In referring to the case studies in this study, Roosli and Collins (2016) write that although states such as Johor and Kelantan are prone to flooding every year, there is still lack of local understanding related to the risk of floods to housing. Rules and regulations provisions for housing are abundant (Figure 2.24 & 2.25), however these are only applicable to the formal type of development or housing. They explain further the post-reconstruction process practised, which was initiated and controlled by the Prime Minister's Department (under the *Unit Pemulihan Pasca Banjir* with National Security Council as moderator) and The Public Work Department at federal level that works closely with the state committee. The decision usually depends on the choice of location of the project; either it will be located at the same area or in a new area. Apart from that, the beneficiaries of the project are given a choice whether to implement an official design or custom-made designs.

Many people in Malaysia have been living in communities that have adapted with the climate and to environmental change over time demonstrating resilience. Without access to advanced scientific information, people who lived in flood plain areas or vulnerable areas were still able to estimate the arrival of the floods through observations, 'interpretation' of their surrounding environment and hearsay from



people in neighbouring places even though the scale of disaster remained uncertain. Flood preparedness was planned accordingly using their indigenous and tacit knowledge passed down from one generation to generation. Thus, when the flood happened in 2014, the post-disaster recovery actions - reconstruction and resettlement - was delayed (Shafiai

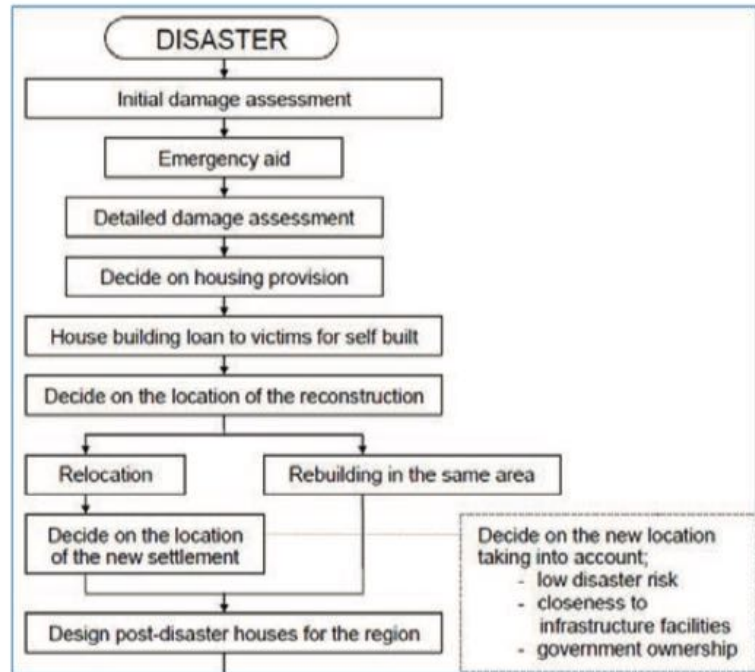


Figure 2.24 The process of reconstruction project (Source: Roosli and Collins, 2016)

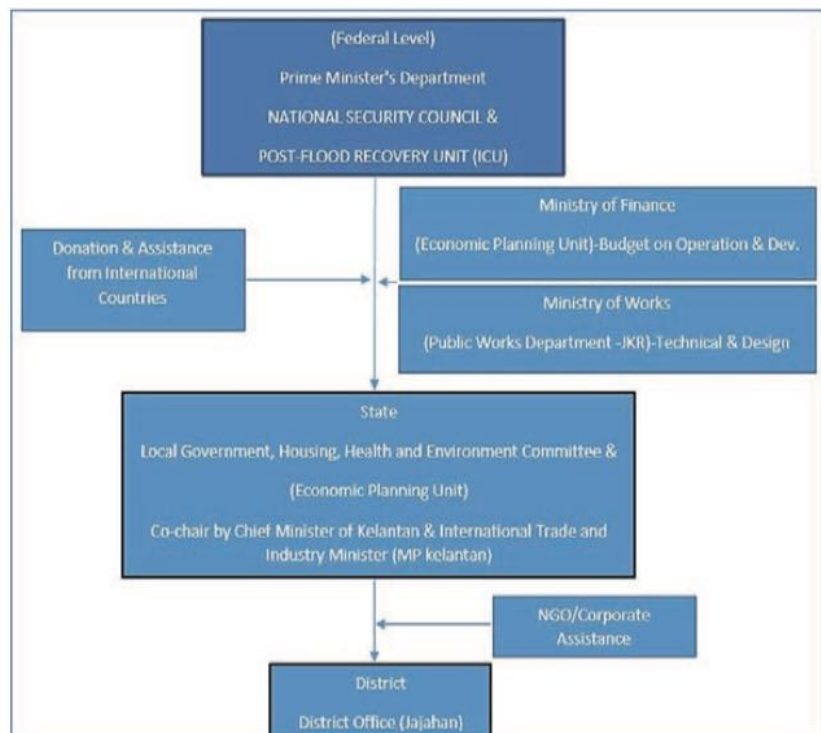


Figure 2.25 Current practice of post-disaster housing provision in Kelantan (Source: Roosli and Collins, 2016)

and Khalid, 2016) due to there being 'no specific guidelines for permanent post-disaster housing provision' in Malaysian policy (Roosli and Collins, 2016), in spite of longstanding awareness of many regions and settlements in Malaysia being prone to flooding.

### 2.3.2 NADMA (formerly known as Malaysia (MNSC on Disaster - Directive 20)

The Malaysia National Security Council (MNSC) Directive 20 is a 'decree that provides guidelines and describes the roles and responsibilities of the public agencies, private entities and non-governmental organisations in the national disaster management'. The MNSC Directive 20 is part of the 'Policy and Mechanism on National Disaster and Relief Management' which is designated as a framework that outlines the land management course of actions according to the level and complexity of a particular disaster. Through this directive in the MNSC (1997), disaster management is categorised in accordance with the scale of disasters as follows:

#### A. Level I disaster

This is a local and manageable incident that do not have the potential to escalate. The disasters are not complicated at this stage and would only cause minor harm to life and property or that does not pose large-scale risks on local day-to-day activity. The District Level Authority is able to control these events through district level agencies without or with minimal external support from the state.

#### B. Level II disaster

Level II is considered a serious incident that covers a wide area or that exceeds two districts. A disaster at this scale has the potential to spread and causes death of people in considerable number and could destroy a large number of properties. These events also impact daily operations of public activities and are more complicated than Category 1 in regard to the search and rescue. With or without limited assistance from outside, the State Level Authority is able to manage such incidents.

### C. Level III disaster

Any incident resulted from a Level III Disaster affects a wide area of more than two states and the complexity is higher in nature. The classification on disaster assessment relies on the multiple level of stakeholders derived from either the district level, state level authority or central authority. The Central Authority could manage the disaster by themselves, or with the help of foreign agencies, depending on the magnitude of the disaster.

The floods which happened consecutively in December 2006 and January 2007, as well as the latest flood in December 2014 were all classified as Level III Disaster since more than two states were affected (Roosli and O'Keefe, 2012). In December 2015, the government decided to form a new agency called the National Disaster Management Agency (NADMA) to replace the MNSC Directive 20. This is due to further amendments in response to the issues encountered during the flood disaster in December 2014.

## **2.4 Temporary homes in transitional period: Dwelling in transition**

Post-disaster housing involves a long-term recovery process. Abdulquadri noted that the 'reconstruction of permanent housing aids the empowerment of communities through the development of local capacities towards building resilient communities' (2017, p.1). However, previous studies on resettlement housing projects for post-disaster recovery efforts had encountered a number of issues. Moreover, misconceptions of recovery issues have led to unsuccessful displacement or relocation programmes. Silva (2011) identified that many post-disaster housing solutions were based on the views and opinions of contributors such as state government, private donors and designers rather than providing for the needs of the beneficiaries as well as reflecting their culture (Davis, 2011; Silva, 2011). He added that the resettlement was undertaken rather as low-cost housing construction, which had a different objective to post-disaster resettlement. Thus, the outcome resulted in the people becoming helpless recipients of relief. Roosli and Collins (2016) mentioned that the involvement of local government and organisations to empower the affected communities is more efficient, rather than bringing in external organisations to solve the problem of resettlement.

In establishing the understanding of the post-disaster temporary home and the architect's role in the recovery process, the question of displacement is expanded to include the approach of designing post-disaster resettlement. What kind of design approach is suitable for resettlement? Silva criticises designers that tend 'to develop settlements that evoke regional and vernacular imagery in its formal and visual appearance'(2011, p.117), in order to create a familiar setting for the beneficiaries. However, a literal translation of local architecture forms in resettlement housing does not provide the desired advantage (Rapoport, 2005). Taking the example of post-tsunami resettlement projects in Sri Lanka, Silva (2011) points out that designers often believe that immediate delivery of a housing unit would effectively solve the resettlement needs. However, the consequence of these fallacies had caused many people to leave resettlement areas and return to their original settlements.

The case of post-disaster housing is 'very peculiar' (Audefroy, 2010). Different to typical housing development, post-disaster housing is referred to as dwellings for those who have been through a rough situation, or traumatic disorder after the force of urgency provoked by post-disaster situations. Thus, it requires different approaches and poses unique challenges for reconstruction developers and architecture practitioners. In order to address such challenges, the actors have to think creatively and view the project differently. Audefroy expressed that post-disaster reconstruction is a 'very fertile ground' (2010, p.665) to experiment with three key issues; (1) construction technologies (2) establish strategies that are suitable for each situation (3) undertake the new social, financial and organizational process.

Although post-disaster recoveries, transitional shelters and resettlement have been discussed widely, there are a number of critical concerns. Wagemann highlights 'the lack of architectural and institutional memory leads to proposals emerging after every disaster that ignore the chance to learn from past experiences'(2012, p.3). Additionally, Silva (2011) expressed that the perception of urgency in permanent housing provision is inappropriate and may result in poor outcomes or failures. He explains further that community redevelopment 'cannot be created at once and at a large scale'. He suggests it should be a situation-specific incremental effort, and for the solutions to match the given situation. This therefore, requires time-consuming settlement planning. Lack of architectural references for post-disaster settlement will lead to the issue of quality as well as quantity.

While establishing the long-term process of resettlement/permanent housing, the affected communities had to go through several phases during the recovery - from emergency tent, temporary/transitional shelter, to permanent housing. There are four category of recovery (Figure 2.26). The 'three phases' is the usual process used for recovery, also called a 'multi-phase approach'. This multi-phase approach to shelter after disaster usually involves overlapping processes through the recovery. Here, the temporary shelter that addresses short- to medium-term needs may last up to 3 years. Meanwhile, the 'continuous phase' is also known as 'transitional approach' that comprises all the stages in a continuous 'incremental process'. In this process, it allows for upgrading into part of a permanent house, where building materials are reused, repurposed and relocated from temporary location to a permanent site. It can also potentially resold in order to generate income for their livelihood or recycled for other reconstruction.

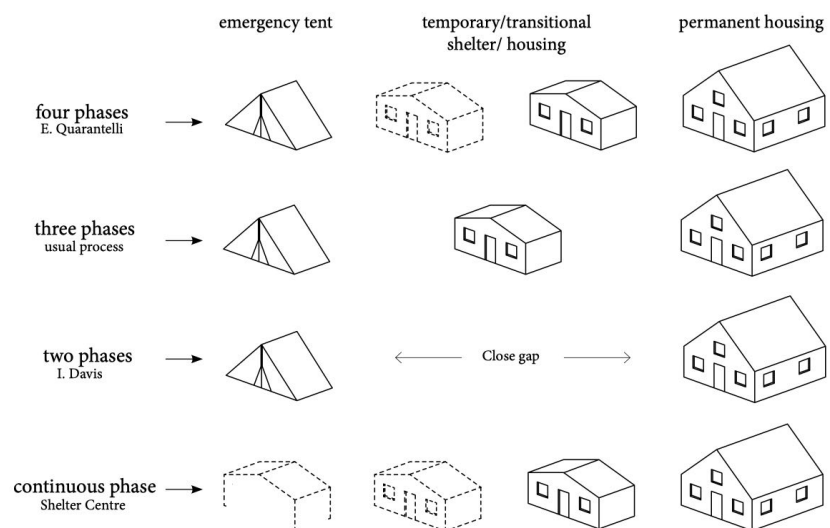


Figure 2.26 Phases of sheltering and housing after a disaster. (Source: Wagemann, 2012)

While other researches (Shelter Center, 2008; Wagemann, 2012; Rohwerder, 2016) define transition as a post-disaster shelter that could transform incrementally from temporary to permanent, this study focuses on the recovery process during the transition period. Therefore the study probes into the responses of flood affected communities; either in their process of 'living', activities or cultural beliefs, hence the term 'transit home' is more relevant than the term 'transitional approach' defined earlier.

The transition period is a crucial phase during the construction of post-disaster housing. It is vital for both the disaster survivors and the architects to share inputs in a limited period of time, to help overcome traumatic upheavals while at the same time fulfilling needs and requirement that respond to the people's culture, social structure, as well as understanding the context. Thus, the information gathered can provide insights that may help improve the quality and development of permanent housing for displaced people.

## **2.5 Architect's role in post-flood disaster practice**

Extreme flood events have caused fundamental damage to humans and properties. Studies have shown that buildings suffered several levels of damages, requiring redevelopment and reconstruction. For that reason, architectural expertise is highly required in this situation. However, in one of his articles, Sanderson (2010) provokes an interesting debate around the role of architects and the relevance of their knowledge concerning the production of space in a post-disaster context. This is because architects are often thought to be the last people needed in disaster redevelopment and reconstructions. He highlighted that the conventional architectural practice 'taught almost the exact opposite of what is needed' in the humanitarian actions - post-disaster recovery and response. Architects are always taught to 'focus on product (a building)' rather than 'the process (involving people)'. Thus, he challenges the architects to explore beyond the common means of design and construction practice, to 'become facilitators of building processes that involve people in places of uncertainty and rapid change'.

Boano and Garcia (2011) focus on post-disaster recovery in Chile following the earthquake of February 2010. They discuss the role of architects in this situation. They highlighted that there are extensive demands for physical reconstruction in the aftermath of a disaster, hence this requires spatial practices such as architecture and urban design to have 'significant influences in reshaping of space' (Boano and García, 2011, p. 294).

Increasing community resilience after a disaster such as by providing good housing schemes is crucial, while experts within the build environment, particularly architects should be trained to help. Architects works are significant in the context of a changing climate and extreme weather events such as flood disaster as they have the ability to propose

solutions that focus on the well-being of people, that are adapted to both the global context and local needs. The skills of an architect can be put to various uses in humanitarian responses; from supporting reconstruction efforts after a natural disaster or for those displaced by conflict, to working with local communities to improve access to their necessities. Bauman (RAIC, 2018) expressed his opinion that architects are 'particularly well suited' for humanitarian works or post-disaster reconstruction because of their 'skills in looking at large, complex problems and find practical, effective solutions'.

In the post-disaster recovery and reconstruction scene, local architects are seen as significant, as they are very likely to have first-hand information to understand the situations and issues. This includes reflecting their personal experience and observation at the site, as well as in their ability to communicate with the locals (authority and community). Additionally, they are able to investigate and analyse technical construction knowledge that is used and effectively engage and consult with the local community on local construction practices.

The importance of architects' involvement in post-disaster recovery and reconstruction is widely mentioned in research articles and journals. Several of these raise the question of the responsibilities that are demanded from the architects in this situation. The programme, *Challenging Practice* offered by the International Chapter of Architectes San Frontières<sup>18</sup> suggests one key responsibility that is crucial for the architects that, 'architects have a role to facilitate and participate in meaningful public conversation, both to understand the requirements and aspirations of the local community and translate these into spatial and visual ideas.' This engagement is important to assist and allow voices from the affected community being heard and valued - technically and culturally.

Rapoport (1973) describes the purpose of design as to 'create environment that suits users, and therefore has to be user-oriented'. It has to be based on understanding of 'how people and environment interact. Thus, it needs to respond to the culture' (Rapoport, 1973). In the book *The interpretation of cultures* by Geertz (1973), culture is described as creating behavioural norms, thus understanding cultural context permits one to anticipate the actions of those people in culture. Rapoport

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<sup>18</sup> Architecture San Frontier aims to provide a critical approach to the surge in volunteer-based practice.

emphasized the need to understand culture in relation to the built environment and outlines three aspects - 'First, culture maintains the identity of groups. Second, culture acts as a control mechanism that carries information of how behaviour and artifacts are to be created. Third, a major role of culture is to act as a structure or framework that gives meaning to particulars' (Rapoport, 1973). In the literature indicating the relationship between the built environment and behaviour, this relationship is classified as an "active and continuous process of interacting and interrelated components" (Rahim and Hashim, 2012).

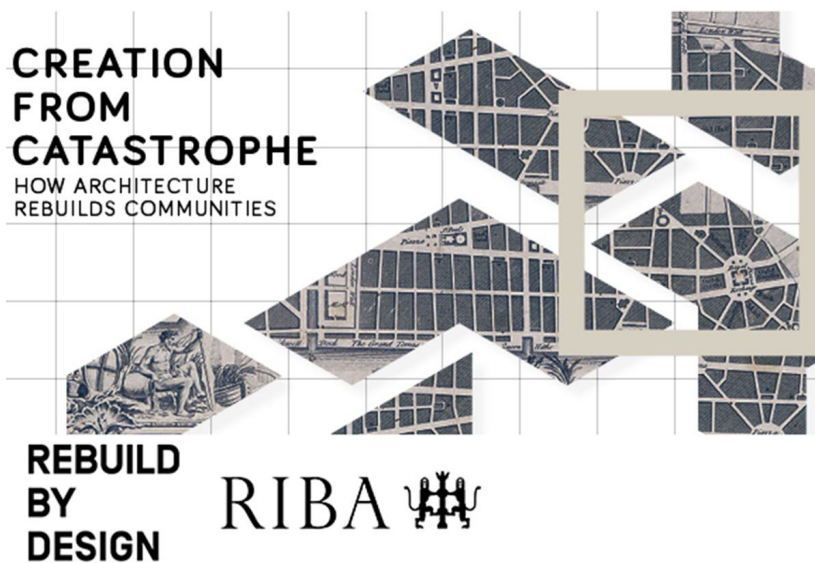


Figure 2.27 'Creation from Catastrophe' at London's Royal Institute of British Architects focuses on the way cities and architects have reimagined communities in the aftermath of natural and manmade disasters (Source: RIBA, 2016)

Listening to the communities that the architects are involved with in the design process is similarly important. Apart from the knowledge of materials and construction techniques, local communities often possess indigenous knowledge concerning cultural matters and future adaptation of building function and structure. Thorough understanding of the context of the project is essential, such as in terms of the users' needs to be met, the way they use the space, their cultural practices around the space and materials, and consequently how to reflect the information gathered to consider the type of building to be built for the community.

The 'Creation from Catastrophe'<sup>19</sup> exhibition (Figure 2.27) organised by The Royal Institute of British Architects in 2016, shared the question of how architects' role in society was changing and what

<sup>19</sup> Further reading: <https://www.ribaj.com/culture/creation-from-catasrophe>



architects can do in the context of catastrophic scenarios. The exhibition focused on the way architecture has reimagined communities after natural and manmade disasters. This included the idea of bottom-up approaches through community-led projects, as exemplified by Shigeru Ban and Alejandro Aravena. Similarly, in events such as the 2016 Biennale in Venice, entitled *'Reporting from the Front'*<sup>20</sup> architects were encouraged to navigate towards a human-centric practice, where the architects demonstrated attempts to find solutions for societal issues through design.

Although architects may have the capability needed in post-disaster situations, what challenges them further is to work within limited timeframes and in changing their approach to what needs to be tackled and focused on in more immediate terms. Wood (2018) points out that, 'as practising architects, many of us will be familiar with the art of balancing visions - those of the client, the user, our own artistic ambition. In the nonprofit sector, those power relations are shifted, and as an architect working in this field it is evermore crucial to also foreground the needs, wishes, and cultural heritage of the communities you work within, whose voices can become distant and quiet.' It is therefore important that a different kind of urgency and care is required in rebuilding post-disaster development, which requires Malaysian architects to address the issues of communities - one that architects were not usually trained for.

## 2.6 Conclusion

Climate change has serves a new purpose, taken on a new meaning and has 'travelled' (Hulme, 2011a) from natural science research to the world of religion, politics, economics, culture and trade. The latest report of WG1 contribution to IPCC AR5, has underlined that anthropogenic or human activities are the main cause of GHG emissions. Climate is defined as twofold, one formally through the use of sciences and statistics where the approach examines the physicality of the atmosphere, while the other responds to the tacit of human senses and imagination (ie approached through studying culture) (Hulme, 2017).

Understanding of future climate risks and uncertainties through imaginative framings, scenarios and narratives is a complex process. In the Western history for example, the thinking and interpretation about

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<sup>20</sup> Further reading: <https://www.labiennale.org/en/architecture/2016>

'risk' has undergone many transformations since it was brought into discussions during the pre-modern era (Hulme, 2011b). The transformation was taken further during the last few decades in the 20<sup>th</sup> century when risks become a calculable phenomenon, hence influencing factors of climate change that has turned from physical to social phenomena.

The study reveals that architect responses and involvement in post-flood disaster and transit time is essential. Nevertheless, architects have to consider more challenges especially in working within limited time. Listening to the community through engagement and collaborative practice is the key to improve responses to post-disaster permanent housing and resettlement.

This study proposes that engagement and actions undertaken with the affected communities could start from the transition period during post-disaster recovery time. The study emphasises that architectural thinking in post-disaster situations needs to have long-term solutions in mind, while at the same time meeting immediate needs. When flood disaster happens, severely damaging places and affecting lives, the process of recovery during the post-disaster is of critical importance. It needs further attention in developing appropriate responses to the situation by improvising and preparing for future scenarios that are unpredictable. Post-disaster projects require the approach of sensitive and careful thinking intended to benefit others. They can also reveal a wealth of lessons to be learnt from, not only on the methods and culture, but more importantly on the value of architectural practice, and how this may need to adapt along with a changing climate.

# Chapter Three

## Examining the Post-Flood Disaster Transitional Home in Malaysia

### 3.1 Introduction

The literature gathered in the previous chapter described a number of concerns. First, the research emphasized the locality of flood-related issues. Secondly, the 'temporary home in transit time' is the main subject of enquiry, while the flood-affected people in transition and associated places within Kota Tinggi and Kuala Krai are the 'context' of the research. A qualitative and empirical research approach is adopted to establish discussion on architectural responses to flood scenarios in Malaysia.

The global environmental issues are pressing architects to rethink about sustainability measures in technologies, materiality and constructions. Similarly, critical attention is required within architectural practice in response to flood scenarios and adaptation measures. This is because flood disasters around the world are predicted to become more erratic. Rosemenn (2001, p. 64) states, 'the process of design has become a process of exploration, a process of researching new spatial possibilities and exploring new methodological approaches.' Therefore, exploring the issues around flood scenarios and adaptation measures through the quality of architecture and design are an important approach addressed in this study.

In this chapter, I outline the research design adopted and the relevant methods used. Significantly, the study has adopted 'fieldwork' as an overarching term for the hybrid methodology deployed. This methodology includes conducting interviews and workshop with groups of participants and a focus on specific case studies. The study seeks to gather qualitative as well as anecdotal information in order to understand and explore the challenging post-disaster transitory situation in depth. Furthermore, the study contributes to the reinterpretation of the process of remaking new resettlements for flood-affected communities.

The following sections outline the research framework in order to explain the essential theme of study: 'temporary home in transit time'

by acknowledging its significance in architecture and identifying lessons that can be learnt. In addition, the framework describes the research process and methods used throughout the study. The whole thesis will be presented as chapters of a story while each storyline combines the different elements and appropriate methodologies adopted.

The study is also a reflection to my own position as a researcher within the research. Throughout the research process, I have experienced various modes of engagement ranging from an observer, to an interviewer, a practitioner, a workshop participant as well as a workshop initiator. This has in turn influenced the way in which the study has been directed. Part of this study is considered as a personal journey as it is conducted within my home country, Malaysia. All of these methods, as well as my personal acquaintances are capitalized to achieve higher understanding of the cases examined.

Due to the complex nature of post-flood recovery operations, the use of mapping, mainly in graphical diagrammatic representations, is a novel contribution to this thesis. Mappings simplify the comprehension in the procedures and the relationship between the stakeholders involved to uncover any insights relevant to the theme of enquiry. As architecture is considered a major part of this study, the use of mappings is common in architectural design methods. I have taken advantage of the design skillsets gained from my experience of architectural practice, that involves mapping, drawings, diagrammatic representation and conducting and participating in design-based participatory workshops.

In short, though the official scientific reports on climate change or flood-disaster provide rich information on environmental knowledge and how the system works, these documents do not take into account how the actual phenomena relate to people's culture and experiences on the ground. Both the scientific reports and the reality of everyday experience presented contrasting narratives. Therefore, this study attempts to critically examine and consolidate two distinct narratives; the technical (scientific reports) and the everyday stories (experiences).

### **3.2 Investigating Kota Tinggi and Kuala Krai**

This study reviews different flood situations between two states in Peninsular Malaysia. Initially, the study focused on the Kota Tinggi town with the emphasis on post-disaster resettlement. The flood that occurred

in Kota Tinggi between December 2006 and January 2007 was recorded as the worst in Malaysian history. It forced the government to relocate a number of families to a new settlement named Desa Sejahtera. Desa Sejahtera had accommodated 360 families that were selected and relocated from six *kampung* (Figure 3.1) in the aftermath of the flood. Though I am from Kota Tinggi myself, the area where my family lived was not affected directly, however it became island-like as it was surrounded by the floods. Indirectly, this meant I also became affected by the situation, which left me with an invaluable experience. Furthermore, it has inspired me to personally engage comprehensively with the Kota Tinggi case while optimistic that what I have chosen to concentrate on was carefully thought of and relevant to current research.

As described in Section 1.11, relocation is a consequence of major flooding, which struck during monsoon seasons and is also associated with the adverse impacts of climate change. Relocation due to flooding is an unfavourable solution for flood adaptation in Malaysia as it involves major changes to the flood-affected community, their social structure and economy. However, flood disasters are increasing exponentially, and it is foreseen that people living in the flood plain areas are likely to be relocated in the future. Unfortunately, less attention has been given to document and understand the extended consequences of the relocation process for flood-affected people, mainly through architectural thinking and practice. Understanding the outcomes of relocation programmes is vital since there are limited references on post-flood disaster relocation particularly in the diverse circumstances of the Malaysian context; racially and culturally. As a result, questions around the discourse of relocation exercises and previous issues to be learnt from have been an important part of this study. Information pertaining to the relocation is gathered through recalling personal and communal histories as well as people's experiences during the transition period emphasized as the 'transit time'.

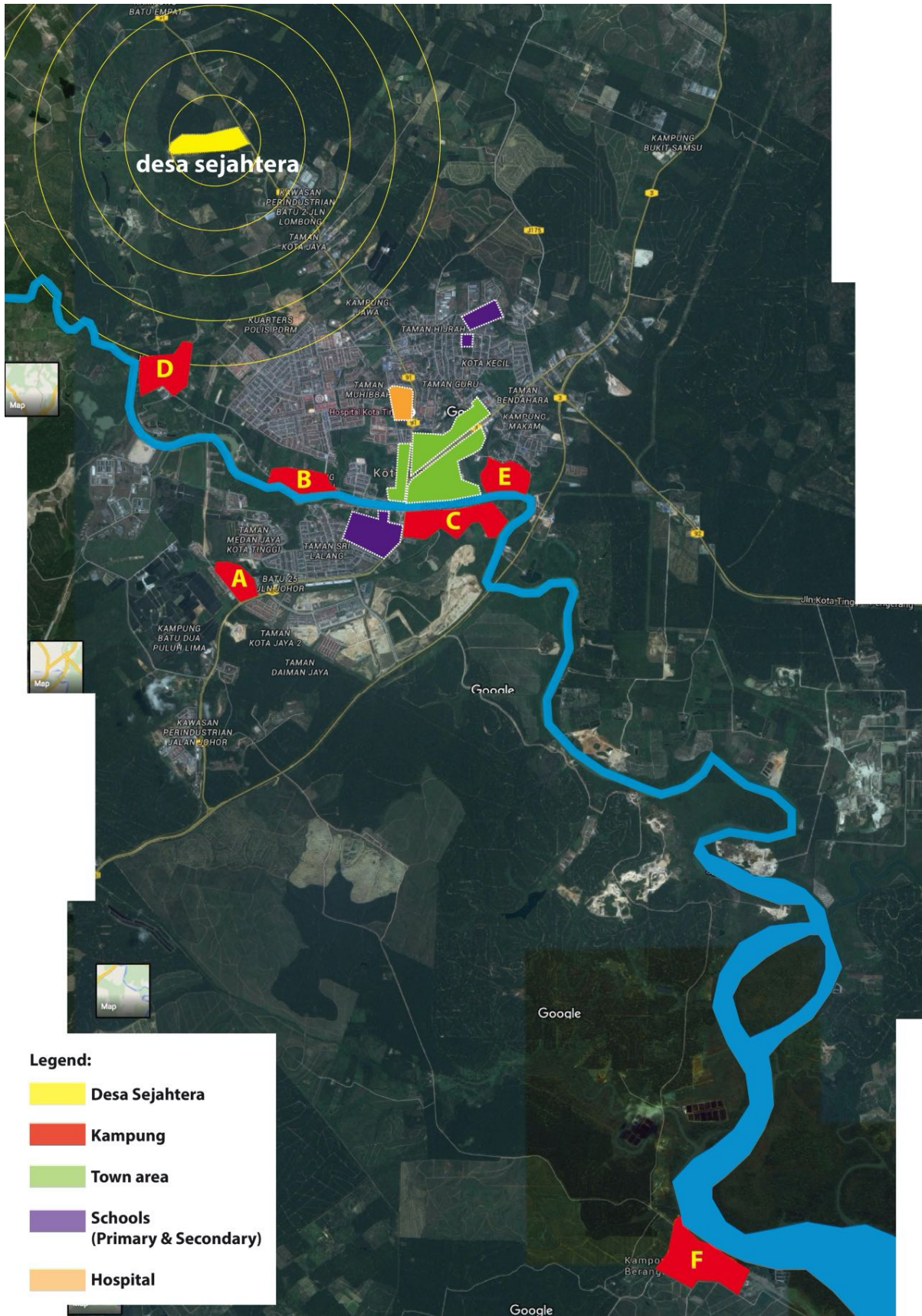


Figure 3.1 Map illustrating the location of existing *Kampung* (red), *Desa Sejahtera* (yellow) and town area (green). *Kampung(s)* that were affected: (A) Kg. Batu 25, (B) Kg. Kelantan, (C) Kg. Tembioh, (D) Kg. Panti, (E) Kg. Makam, (F) Kg. Sungai Berangan (Nor Izura T., 2015).

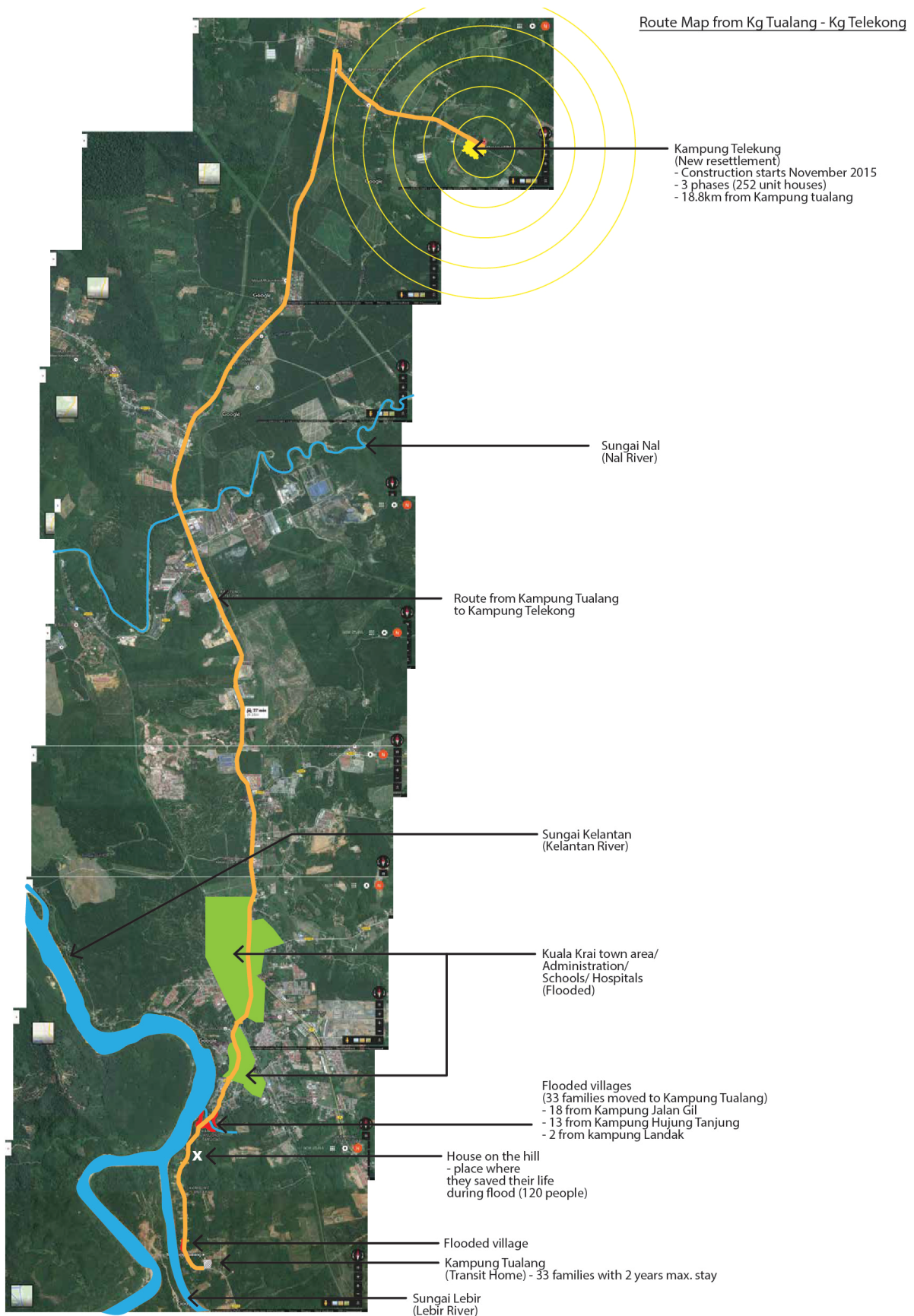


Figure 3.2 Map illustrating the location of Kuala Krai town (green), *Kampung* (red), PMT (orange) and the new resettlement housing – Kampung Telekung (yellow). It clearly shows that the flood victims were relocated away from their original kampung.

Although the Kuala Krai case study (Figure 3.2) was a unique incident, I had not initially planned to include this area as part of the research. However, during the first fieldwork conducted in December 2014, a major flood had stricken the East Coast of Peninsular Malaysia and Kuala Krai was one of the towns severely affected. The disaster shocked the nation and myself personally and this significantly changed my research direction. The flood disaster in Kuala Krai was considered to be an important opportunity to gather insights of post-flood disaster situation from first-hand experience during my presence in Malaysia at that particular time. Subsequently, the new case study has influenced the approach to the research methodology that is more inclusive of most of the stages within the post-flood recovery timeline.

In Kuala Krai, the focus of this case study is the narratives of the 'people in transition' and the actions taken during the post-flood transit time for their long-term requirements. The emphasis is on the process of rebuilding homes for people in transit in Perkampungan Mercy Tualang (PMT) by Mercy Malaysia (refer to 5.5.1c). The PMT caters for 33 families that have been relocated from three main *kampung* badly affected by the flood disaster in Kuala Krai. The PMT is one of the many examples of a displaced community within a transitional dwelling initiated by a humanitarian agency based in Malaysia. It was also as a result of the medium-term post-flood response, which was also developed by architects from a design standpoint - an initiative often neglected by other agencies.

### **3.3 Fieldwork as Research framework**

The fieldwork approach has been adopted as an ethical choice of methodology in search for issues and processes relevant to the topic. In general, fieldwork is understood as going out in the field and conducting exploration or observation in the real world (Massey, 2004). Nonetheless, understanding fieldwork in the context of architecture 'requires critical attention' (Ewing, 2011, p. 1). Acknowledging the establishment of fieldwork that is based on participant observation as 'anthropology's primary mode and method of enquiry' (p8), McGowan (2011) highlighted that the position of fieldwork in architecture, is far less defined. This has been emphasized particularly on, 'a range of problems and potentialities in architectural thought and practice' (McGowan, 2011, p. 8). Thus, McGowan expressed the possibilities of applying anthropological approach to fieldwork in architecture as a method of 'observation, data



acquisition and representation' as well as 'a way of interacting with, documenting and responding to a specific people, time, place and circumstances'.

The fieldwork in both Kota Tinggi and Kuala Krai was intended to observe the post-disaster situation in obtaining the locals' personal narratives concerning their experiences with flood disaster and its aftermath, especially insights on living in transition and relocation. The situations had unavoidably affected me personally as an architect. This genuine experience of post-disaster is also considered as a first-person account of fieldwork, and involved a profound and intense personal engagement. It reveals the value and importance of 'self-conscious' and reflective approach beyond being an architectural practitioner or objective researcher where conducting fieldwork is not only a 'profession' but also a personal quest for understanding.

Whilst the study attempts to create linkages between flood disaster as a climate change impact and the in-transit post-disaster situation, the fieldwork acts as 'reflective practice' (Schon, 1995) highlighting the mundane and often overlooked architectural thoughts and practices associated with flood-disasters. Perhaps, an appropriate term to describe this method is 'architectural fieldwork', which may counter the tendency for architectural practice to dominate, and with a generally narrow focus on problem solving or creating solutions. Schon (1995) relates fieldwork to practice, which varies from one discipline to another, and 'may contribute to the consolidating, deepening and extending of disciplinary knowledge'. This has also been highlighted by Ewing (2010) in her book titled, *'Architecture and Field/Work'*, as fieldwork is about experiencing the situation. Furthermore, the process requires awareness and consciousness, understanding the situation and then to be reflected while acting and on acting:

*'Thinking on our feet', looking to draw from experience and from what has gone before, to connect with feelings, to attend to theories in use and construct new understandings which inform actions in unfolding situations, may engender ways of thinking about what it might be to practice, within a disciplinary framework or as a professional: to reflect while acting, to reflect on acting.'*  
- Suzzane Ewing, 2010

On the other hand, the study inhabits the notion of fieldwork by situating myself as an academic researcher in the field. Here, the fieldwork takes on the 'umbrella' term for the hybrid methodology adopted which gathers various narratives to understand the context of the events in the context of flood disaster. Narratives allow for the combination of methods in obtaining the data, which in this study is through fieldworks and case studies. The need of different methods is vital and furthermore the narrative acts as a framing device that helps to bring these methods together. Narratives were based on the interviews, anecdotal evidences, workshops, and diagrams constructed. Each part is thoughtfully considered and is sequenced as an unfolding of the stories taking shape, hence the use of mappings as part of the methodology to conceptualise these findings appropriately.

As a researcher I have explored and analysed personal experiences from fieldwork, attempting to generate an original approach to 'architectural fieldwork'. The evidence gathered from flood-affected people went through a process of self-reflection, validation with respect to existing social theories, as well as confirmation from workshops with different groups conducted in order to connect to wider social meanings and cultural understandings. As a result, the research questions embracing the direction of the study involved multiple and constant iteration. The iterative nature of the study allows for new evidence and experience to be acknowledged in the process of research and become part of the wider discussion.

Eventually the individual and collaborative accounts of what Schon described as 'reflection-in-action' and 'reflection-on-action' position myself as an individual from a similar local background or culture, an academic researcher or architectural fieldworker, a participant-observer, and participant-navigator of architecture. These multifaceted characters allow for the study to be fluid and open and help with impartiality from any preconceived ideas. Therefore, the fieldwork is a crucial part of the study that seeks not only to understand the given situation but the repercussions and consequences of the actions that unfold from these findings.

### 3.3.1 Documentary Evidence

The research involves dual investigations of both primary and secondary data. Initial research requires the collection of secondary data or documentary evidence from literatures, covering multiple resources.

This includes published texts mostly from books, journals, handbooks and relevant government legislation and documents from other organisations, international scientific reports such as IPCC and UNFCCC, as well as national level scientific reports. Other resources include articles, annual reports and proceedings or conference papers that focus on the study of flooding, post-disaster and resettlement in Malaysia.

The concept of climate change is understood from the social sciences' perspectives referring to publications from Mike Hulme, Kathryn Yusoff and Jeniffer Gabrys, Sheila Jasanoff, Renata Tyszcuk, Joe Smith and many more. This heightens the interest to further understand the climate change impact from a variety of disciplines. As research of climate change knowledge has developed, it has changed the way climate is understood; especially in terms of the significant cultural relationship between humans and the weather conditions with which they dwell. Similarly, it has also examined the experience of climate and how it influences people's sense of space and time.

The insights gathered from both scientific and non-scientific sources have brought attention on climate change as a macro issue into a more intimate scale of research. To understand further the climate change situation within the local setting, the research reviews journal writings and articles from scholars such as Chan Ngai Weng, Joy Perreira, Syawani Shafiai and Al Amin et al. These researchers have been focusing on climate change impacts in Malaysia in different domains such as water resources, hydrology and flood hazard management.

This study takes into account the texts from Ian Davis, David Sanderson, Silva, Boano Garcia, Elizabeth Ferris and others that have written on post-disaster impacts within the context of architecture and housing reconstruction. The post-disaster reconstruction issues especially in response to displacement and relocation were only defined by the attributes of past cases concerning the durability, sustainability and, people's tradition and culture. The study also takes into account the works of Ruhizal Roosli on disaster management within the architectural context including his latest article on post-disaster permanent housing provision in Malaysia.

Studying the fundamental issues of climate change, displacement, relocation and resettlement serves as the foundation to re-establish and re-think the architect's role in post-disaster situation, especially during its transit time. Supporting evidence was gathered from

documents produced by the Malaysian authorities and development agencies, although such documents and texts are limited in publications as the contents were only prepared for a specific purpose.

As a result, additional data were acquired from direct resources from council offices during the fieldwork. Part of the analysis from the official report such as the *Local District Planning Reports* provides insights of existing and future town planning of the districts. The report is centred on the information of the town development that was affected within the flood area. This includes data related to (1) the location of the river and its character, (2) the location of the *kampung*, the town centre, and the new resettlement, and also (3) the infrastructure within its parameter. This is crucially important in order to understand the aspects that may influence the flood impact as well as the relocation strategies due to the flood disaster.

The research also reviews texts related to the history of floods in Malaysia, especially on the overview of the historical major floods documented within the period of 80 years that had hit the districts of Kota Tinggi and Kuala Krai. The timeline generated reveals the pattern of major flood frequency - which on average occurs every 35 to 40 years. Furthermore, the information from related newspapers, photos and videos of both cases from social media were gathered, specifically linked to the case of the Kuala Krai flood disaster in 2014. In comparison to the Kota Tinggi case study, there were large numbers of images and videos from the official news particularly from individuals shared on the Internet (ie. social medias) during and after the disaster. This live updated information was significant to the research as it rendered and revealed people's genuine situations in transition after the flood disaster while I was a thousand miles away from the site.

Although the desk-based research method provides rich information on the related topic, the data gathered is further benefited from going into the 'field'. The process such as reviewing texts, photos and videos does not provide specific information required from a specific site. Massey (2004) highlighted that both are 'two distinct moments in the overall process' of research with 'different manner of addressing the object of study'. Furthermore, some of the texts especially the official documents, were gathered during the fieldwork. Hence, the research demands an involvement of both processes of to-ing and fro-ing.

### 3.3.2 Observations

Part of the fieldwork involved initial surveying and observing of the place. The initial observation during the first fieldwork in Kota Tinggi was to observe the impact of 10 years since the flood disaster. The inquiry evolved around the question of 'what has changed since, and what has not?' with further testimony and verification from the interviews conducted. Meanwhile in the Kuala Krai case study, the question raised was, 'what is happening at that particular moment and what are the immediate actions occurring?' Both case studies were further interrogated with specificity on the situation observed.

In contrast to the initial observation, detailed inspection with respondents involved visiting the areas they were familiar with, in order to gain specific insights and genuine information. This is also conducted within the physicality of the context and in regards to the situation, issues, and problems. Here the observations were twofold, from the respondents in terms of their direct experiences, and also from my own experience and observations as a researcher and participant in the aftermath of flood disaster. Observations from my point of view relate to the practice of 'paying close attention to experiencing the encounter with otherness (of myself and the respondents). It involves the sensate observation of daily life, especially those mundane details we feel in our bones but which cannot be readily articulated (...) where the smallest hint of a reflex action, a slip of the tongue, a somatic experience are never unimportant' (Lundberg, 2008, p. 4).

Observation was inevitably limited as some of the occurrences could not be explained, and thus required me to make 'educated guess[es] about the things which go unspoken' and therefore the observations include 'making the most of the little,' suggestions from attending the fieldwork (Becker and Geer, 1957, p. 30). It is therefore important that the observations were paired together with verbal inquiries, such as interviews.

### 3.3.3 Interviews

As part of the fieldwork, interview methods were used to support observations and desk-based study. The study adopted the use of interviews, mainly with the flood-affected people in both Kota Tinggi and Kuala Krai, and other participants who were directly involved in the process of understanding post-flood disaster response. There are two

categories of flood-affected people defined in this research; (1) people who experienced the process of being in transit, and were now relocated and living in the new settlement (in Kota Tinggi) and, (2) still experiencing living and dwelling in transition (in Kuala Krai).

In this exercise, semi-structured and unstructured interview techniques were chosen to allow flexibility for the respondents (Table 3.1 & 3.2) to express their story and thoughts in regards to the subjective matter of the post-disaster transition and displacement. Furthermore, these were considered to be the most effective way of gaining detailed responses and understanding of the experience of flood disaster, as well as planned resettlement in Malaysia. This was considered to be more effective as it 'explore[s] many facets of the interviewee's concern,' (Becker and Geer, 1957, p. 28) than asking respondents detailed structured questions about specific issues.

For example, in the case study of Kota Tinggi, some respondents found it difficult to accurately recall information from before the floods of 2006-2007. Thus, the details information were gathered and analysed through the semi-structured interviews; that allowed respondents to connect their insights of the events through narratives. Thirteen respondents were involved in Kota Tinggi. Respondents were identified based on their *kampung* of origin and age. This helped to ensure that respondents represented a cross-section of the different *kampung* communities involved in the study. The way of approaching the respondents for interviews is important; as this will influence the way they react and tell their stories.

Although the respondents had experienced the flood disaster, it is observed that the majority of them felt 'disinclined' to start the conversation; often expressing that they were 'not well versed' in the related topic when they were approached for an 'interview'. This is due to the 'interview' situation that was imagined to be in a formal manner. It is also identified that the respondents were however feeling more comfortable when approached and asked to '*kongsi*' or 'share' their story and discuss it, rather than be 'interviewed'. Therefore, I decided to conduct the interview in groups of two as respondents reported feeling more comfortable and at ease during the presence of the interviewer or researcher.

No.	Respondents	Kampung (Figure 3.1)	Age	Occupations
1	P	A	66	House maker
2	K	A	43	House maker
3	R	B	58	Retired (Gov. worker)
4	Z	B	60	Retired (Gov. worker)
5	ID	C	41	Self-employed
6	Y	C	65	Self-employed
7	D1	C	63	House maker
8	S1	F	75	House maker
9	D2	F	76	Retired (Gov. worker)
10	S2	D	63	House maker
11	J	D	65	Retired (Gov. worker)
12	E	C	27	House maker
13	S	C	33	House maker

No.	Respondents	Kampung (Figure 3.2)	Age	Occupations
1	MY	Kg. Landak	70	House maker
2	KI	Hujung Tanjung	45	House maker
3	E	Landak	33	House maker
4	KN	Jalan Gaele	45	House maker
5	KD	Jalan Gaele	43	Self-employed

Table 3.1 (above) List of respondents from Desa Sejahtera  
Table 3.2 (below) List of respondents from Perkampungan Mercy Tualang

Respondents were interviewed and asked to supply basic information on their household characteristics, their views on the quality of life before, during and after the floods as well as the motive of changes in their lifestyle if any. The interviews conducted aimed to hear their authentic voices - listening to their stories, insights and experiences about this historical event. Limited by the numbers, the research was not representative of all the villagers and did not aim to provide general views concerning place attachment, but rather intended to provide a deeper understanding on various insights and experiences on the quality of life before and after their shift to Desa Sejahtera and how it might impact their everyday routine and socio-cultural environment.

In the attempt to obtain information during the fieldwork, I used a mediator to get to know the locals. Intermediaries are important especially during the fieldwork in Kuala Krai, as the locals were in displacement and it is difficult to find particular people at a specific place.

One of the ways to establish the connection was during the workshop seminar that I attended in Kuala Krai (refer to 4.6). I met Mr Norazam (the Mercy officer), who then suggested to me that I get in touch with the leader of Perkampungan Mercy Tualang - who was also one of the respondents for this research.

Here, in establishing relationships with respondents, the research fieldwork fundamentally begins with an exercise in building trust and friendship. Furthermore, the semi-structured and unstructured interview has the upper hand to 'pursue interesting leads' (Becker and Geer, 1957, p. 28) by introducing relevant questions that are spontaneous in order for respondents to articulate their stories fully. Asmahan Abd Razak pointed out two important aspects that should not be neglected when conducting an interview within fieldwork, which are the personal and cultural aspects. This is especially crucial when conducting the research within the researcher's own society and familiar environment<sup>21</sup>.

To offer a comfortable environment for the respondents during the interviews, Malay language was used throughout both case studies. Using their mother tongue is another way for respondents to express their personal narratives without having to feel shy or fear 'interviews'. Moreover, keeping sure that respondents felt at ease was to interview them at their available time and within the convenience of their own spaces, though this had to be arranged for an appointment first.

In contrast to the respondents from flood-affected communities, the interviews conducted with the local councils and professionals were conducted differently. The interviews were inclined towards the semi-structured interviews as the goal was to inquire on the specific subjects derived from the observations conducted earlier. The interviews with the councils were mostly related to procedural policies as well as the official measures from the local district and state. Meanwhile the interviews with the professionals were to challenge them for a response to the fieldwork findings and outcomes tabled out.

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<sup>21</sup> Abdul Razak reflected her own experience conducted a research locally - in Malaysia and described, "I took for granted the cultural aspects of my own society for it is 'at the back of my hand' and hence dismissed it on grounds of being insignificant as I would be in familiar setting – that is, 'I know my culture'". (Abd. Razak A. in Cross Cultural Perspectives On Educational Research, 2005).



### 3.3.4 Workshop as Design method

The design methods were taken into consideration in this research as a holistic approach in order to acknowledge the different observations and analyses in the process conducted. Whilst conducting interviews the aim was to gather information and experience from the people, the workshops were conducted with professionals with the aim to bring them to think through the research about this challenging environment, particularly on flood disasters. The workshop challenged the professionals to act and find solutions from the findings gathered through the observations and interviews. The workshops examine the questions such as the 'role of architects in post-flood situation?' And 'what can be learnt in current and previous post-flood recovery and timeframe.' Such questions are oriented towards the responsibility of architects as professionals as well as their role as catalysts for the rebuilding process.

The workshops described could be defined as follows: the workshops that I attended as a participant and the workshop where I acted as a moderator. In March 2015 during the first fieldwork and the aftermath of the Kuala Krai flood disaster, Mercy Malaysia conducted a workshop and a seminar to discuss on the Total Disaster Risk Management. Though the workshop focuses on the Kuala Krai flood disaster, it covers the general dialogue on post-flood recovery implementation and organization looking at previous and current practice. This workshop, which I participated in, was not only beneficial to the context of the study, it also became pivotal in the introduction of Kuala Krai fieldwork and case study. The workshop is explained thoroughly in section 4.5 in the fieldwork findings.

Subsequent to the fieldwork I conducted in Kuala Krai and Kota Tinggi, a workshop was organized on 19<sup>th</sup> December 2015. This workshop was intended to include architects who were involved indirectly or directly with post-disaster responses. The aim was to acquire insights on post-disaster recovery actions and responses from the architectural point of view. This also allowed a reflection on current architectural thinking particularly in review of architectural practice and in relation to a certain flood disaster situation that is uncertain in scale.

This section explains the methods used to elicit experiences and opinions from architects with regards to post-flood-disaster and architecture. Qualitative methods used in a workshop setting provide participants with 'an opportunity to exchange information, practice skills

and give or receive feedback, and when properly designed, is an effective method of actively involving participants in the research process' (Beatrice, 2015). Workshops also tap into subjective past experiences and are an 'efficient way to collect large amounts of data to describe, compare, or explain a social phenomenon' (Fink, 2006) as they permit interactions between the participants (architects) and build on one another's comments, at the same time allowing the facilitators to enquire for further explanation.

The workshop with the architects was held in December 2015 at Seksan's office, which lasted for 180 minutes. Interview questions were developed with the direction and input from the first fieldwork conducted between December 2014 and April 2015. The topics of the workshop were designed to cover a range of architectural post-flood disaster recovery and responses issues, mainly in connection with the transition period from the latest Kuala Krai flood that had occurred in December 2014.

The workshop was conducted in English; however, the participants were allowed to use both Malay and English languages in order to allow them to express their opinion clearly and in comfortable manner. Participants were given some materials such as A0 papers and marker pens for them to write or draw any information and ideas that they had in mind. Informed-consent procedures were read and explained at the beginning of the workshop, after distributing the consent forms. All discussions during the workshop were audio-recorded and image-recorded with the permission of participants.

The audio-recordings from the workshop were transcribed and analysed through several phases. A preliminary analysis was conducted in order to achieve a general sense of the data and to reflect on its meaning. A more detailed analysis was subsequently carried out and data was divided into sections or units that represented participants' specific thoughts, attitudes, and experiences. To conclude the process of analysis, a list of topics was generated and grouped into categories, marked as key findings.

Out of fifteen invited, four architects agreed to attend the workshop. At the same time, three had expressed their interest to participate in the discussion but were unable to attend during the scheduled workshop time and place. Therefore, three additional personal interviews were conducted in January 2016 in order to gain additional information that was not discussed during the workshop.

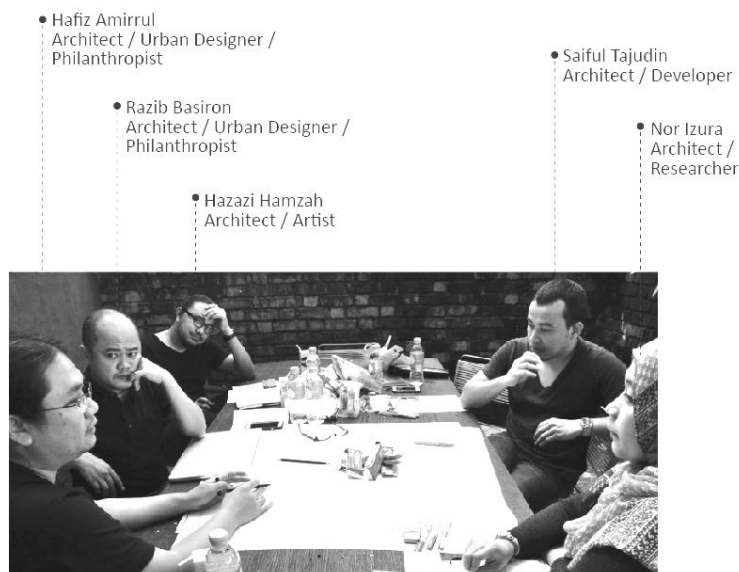


Figure 3.3 (Above) Participant (Architects) involves in the Workshop organised on 19th December 2015.

Table 3.3 (Below) List of architects who participated in the workshop and their background.

Name	Experience
<b>Hafiz Amirrol</b> - Architect and Urban Planner at Extra URBANDesign firm - Affiliated with Mercy Malaysia	Affiliated with Mercy Malaysia in humanitarian works. One of them was during tsunami in Aceh and earthquake in Sumatera. Also involved in PMT, Kuala Krai development. Attended Sendai Framework conference and numbers of DRR related conference.
<b>Saiful Tajuddin</b> - Architects at TA Global (Developer) Architecture and Conservation background	Never involved in any humanitarian or flood mitigation or flood rehabilitation project.
<b>Razib Basiron</b> Urban Planner at Extra URBANDesign Architect at KLSuperStudio	Affiliated with Mercy Malaysia in humanitarian works. One of them was in Pakistan. Involved a lot in technicality and construction design strategy. Also involved in PMT, Kuala Krai development.
<b>Hazazi Hamzah</b> - Architect at StudioKARYA	Involved in bungalow and housing design. One of the projects was a bungalow in Kota Bahru – under construction during the 2014 flood.

The workshop began with the introduction of participants and their association with either private architectural practice and/or with NGOs in humanitarian works. It provided the ground for a fruitful discussion among participants since everyone could relate and acknowledge each person's affiliation and their outward views within this topic. The list of architects participating in the workshop and their backgrounds is described in Figure 3.3 and Table 3.3.

In this workshop there were six key issues brought up during the discussion by the participants and myself. These issues are categorized into themes such as (1) Disaster and risk reduction, (2) Post-flood recovery

and responses with regards to reconstruction, (3) The definition in terminologies such as ad hoc, transit, permanent housing, (4) The architects relevance in post-flood reconstruction and recovery response, (5) Questions of 'how can the architects 'add value' to the post-flood projects?' and finally on the issues of (6) Post flood recovery timeframe. The detailed discussion is summarised in section 5.7.2 of 'Negotiating with the Architects'.

### 3.3.5 Mappings

The contribution of mappings within the study was to understand the complexity of the post-flood recovery issues and interrelationship of the stakeholder's role and actions involved. Mappings are an important way to identify the variation and knowledge gaps that are disregarded but actually play an important part in post-disaster recovery. To recognize the practicality and deployment of transit shelters, mappings highlight the significance of the shelter among the other types of reliefs. This is to examine the pattern of displacement and relocation that these people have experienced, the significance of transition shelters and how the distance may influence the outcome of the relocation.

## 3.4 Conclusion

The inquiry into 'temporary home in transit time' in the context of post-flood recovery in Malaysia necessitated the development of a hybrid research methodology, termed 'architectural fieldwork'. A mixed-methods approach was adopted including qualitative and empirical research to establish the discussion on architectural responses to flood scenarios in Malaysia. The research emphasized the locality of flood related issues. Its focus was the flood-affected people in transition within Kota Tinggi and Kuala Krai as the 'context' of the research.

The following sections of the thesis explore the research framework and the essential theme of study as 'temporary home in transit time' by acknowledging its significance in architecture and identifying lessons that can be learnt. The research framework describes the research process and methods used throughout the study. The whole thesis will be presented as chapters of a story while each storyline combines the different elements and appropriate methodologies adopted.

# Chapter Four

## The Story of Fieldwork: Kota Tinggi, Johor

### 4.1 Introduction

This chapter focuses on the story of fieldwork conducted in Kota Tinggi, Johor, between December 2014 and January 2016. It gives an account of the relocation of a community devastated by the floods of December 2006 and January 2007, to a newly constructed housing settlement, Desa Sejahtera. The relocation involved selected families from six *Kampung*<sup>22</sup> that was coordinated by the local district council in 2012, almost five years after the flood. The Desa Sejahtera housing development was revisited during the fieldwork to evaluate and obtain insights from the families' perspectives. The process of organising post-disaster resettlement is explained together with the execution and assessment of the new settlement nearly 4 years after its initial occupation. The history of floods in Kota Tinggi will be described briefly

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<sup>22</sup> Kampung is a Malay word that literally refers to the village(s) in Malaysia. However, the word 'kampung' is seen to be more appropriate to use in this research as it represents more specific meaning than the word 'village'. According to Maliki et al (2015, p.606), 'as a verb, kampung means *to bring together* or *to group*, carrying with it a collective a very social idea, and as an adjective, kampung means rural, homemade and countrified'. From the perspective of anthropological, geographical and social science, Yoshihiro (2001, p.98) described kampung as 'a series of overlapping neighbourhood circles'. Mahmud (2004, p.176) explains further that the scale of kampung is varies as it may consists of a 'set of residents within a family compound' or 'a collection of such compound'. Kampung is formed through the evolution, adjustment and adaptation of peoples' occupancy and routine practices. Their common social economic, interactions and interest become reasons for them to stay in the kampung'. Maliki et al (2015, p.606) elaborate on some important elements and spatial characters of a Malay kampung, which relate closely to the distance between houses within the compound that is 'not too close and not too far from one another', at the same time retaining adequate space for privacy, but within visibility and sufficient indirect surveillance within the space.

In addition, *halaman* or compound is another important spatial characteristic of a Malay kampung house. *Halaman* is an 'intermediate open space between the privacy of a house and the public area of a kampung. It is commonly a fenceless compound around a Malay kampung house serves as a multifunctional transitional space outside of the home'. The functions of the spaces in the compound are changeable according to needs and normally useful when organizing an event such as wedding. Hence, space sharing is easily encouraged, as most houses in the kampung are fenceless' (Maliki et al, 2015, p.606). Maliki et al (2015) also address that there is a 'respect for private and public use of space without needing clearly imposed physical boundaries [...] The minimal use of visually and physically obstructive barriers in kampung suggested that the communities have to recognize the 'invisible boundaries' and built up a 'mutual agreement' by confronting to cultural rules and norms' (Maliki et al, 2015, p.606).

in order to provide the context for understanding the flood events of 2006-2007 and also the post-flood recovery and responses in their aftermath. The flood history and resettlement process was studied through personal observations and experiences, narratives from the local people and professionals, as well as media accounts and documentary evidences.

This chapter is divided into 3 sections. The first focuses on the background of Kota Tinggi and its relation to flood history. The second part is about the flood events in December 2006 and January 2007. The case study covers both flood events as they happened within a short sequential timeframe and hence, resulted in continuous and correlated consequences. It also describes the impact of post-flood actions and implementations nearly a decade after the disaster happened. Lastly, the third part focuses on post-flood recovery and responses. Its main emphasis is on the relocation and resettlement process of selected families from the community; from their original *kampung* to a new settlement (housing development) set up by the government, named Desa Sejahtera.

Fieldwork has been conducted in order to gather narratives of the experience of the flood and resettlement process from the residents and then gain insights for the research through evaluating this information. Two fieldwork trips were made to Kota Tinggi. The first one lasted for 4 months from December 2014 until March 2015 and the second for 2 months from November 2015 until January 2016. During these trips, empirical information was gathered. Semi-structured interviews were conducted as the main method of data collection as it was considered to be the most effective way of gaining an understanding of the experience of flood disaster and planned relocation. This was deemed more effective than asking respondents detailed structured questions about specific issues as some found it difficult to accurately remember details from before the flood of 2006-07.

This chapter discusses what can be learnt from the resettlement process, which could be relevant to present-day flood disaster responses. It reviews the principles underlying the resettlement process established by the UN and local authorities as well as the growth and development of the new settlement after its initial occupation. It will assess the progress of resettlement since the establishment of the new settlement in 2012.

This chapter uses the first person narrative<sup>23</sup> to describe comprehensively the author/researcher's point of view, perspectives and analysis. The account of the respondents' narratives will be distinguished with their quotes highlighted in *Italic*.

## 4.2 Kota Tinggi, Johor: The Background

### 4.2.1 Geography and flood



Figure 4.1 Two states highlighted in green shows the location of case studies in this research. (Right) Shows the location of case study in Kota Tinggi town in Johor state.

Johor is a state located in the southern part of Peninsular Malaysia. It covers an area of 19,095kmsq, with a population of 3.49 million people (Department of Statistics Malaysia, 2011). Surrounded by the three most important seas in South East Asia (the Southern China Sea, the Straits of Malacca and the Straits of Tebrau), it encompasses 400km<sup>2</sup> coastal area that is the longest in Peninsular Malaysia (ICLARM, 1991). Johor consists of 14 river basins including the Johor River.

Johor is divided into 10 districts, which are in turn subdivided into *mukim* (sub-districts) and *Kampung*. Kota Tinggi, (Figure 4.1) is the largest district in Johor. This district covers 3,488.70 km<sup>2</sup> with a population of 192,220 people. The district of Kota Tinggi is renowned for its cultural heritage especially from 'the era of Malacca Malay, Johor-Riau, Singapore and Linggi' in the 15<sup>th</sup> century (J et al., 2012). This case study focuses on

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<sup>23</sup> The first-person narrative is also similar and repeated in Chapter 5.

the administrative centre of the district, the town that is also known as Kota Tinggi.

Kota Tinggi has its historical importance as it was once a centre for the government of Old Sultanate of Johor about 400 years ago (J et al., 2012). Among the major displays is the glorious history of *Sungai Johor* (Johor river). The river is very significant as it crosses the heart of the town. During that time, the river was used as a main route for traders and merchants. Small boats became the main transportation to cross the river from one part to the other, until the British colonies were established in 1930s when a wooden bridge was built to connect both parts of the town (Mardi, 2008). The bridge is well known as *Jambatan Kota* (Kota Bridge). The introduction of the bridge reduced the use of small boats and further influenced the development of the town. The bridge however, was destroyed and rebuilt several times due to war and the change of rule (Mardi, 2008). In 1962, the bridge was reconstructed using reinforced concrete. Shops, schools, religious buildings and houses were built near the river where development expanded. Seasonal events such as water festivals were organized and still take place along the river, which gives the district an especially strong and unique character in relation to the town. The bridge and the river are also commonly used as a reference point of direction within the town.

The Kota Tinggi town is located lower in altitude than the surrounding area, creating a valley and waterways. This makes the area more prone to frequent flooding especially during the North-East seasonal monsoon. This has both weakened and slowed-down the town's development (MDKT, 2011). Historically, since the year 1900, this town had been hit by a number of severe floods due to unusual monsoon phenomena including in January 1948, December 1967 & January 1968 (Figure 4.2), December 2006 and January 2007. Kota Tinggi was one of the worst affected areas during the 2006/2007 floods.

The district of Kota Tinggi is renowned for its cultural heritage alongside its distinctive geography (J et al., 2012). The main source of economy is from the agriculture sector as it covers about 61 per cent of the land of the district, especially the palm oil industry. (MDKT, 2011).



Figure 4.2 Malay newspaper article dated 17 December 1969 titled 'Banjir: Penduduk2 Kota Tinggi bimbang' (Flood: Kota Tinggi residents worried) - Residents hoped that the 1967/68 big flood will not happen again that year (Source: National Library Singapore, 1969)



### 4.2.3 Religion and culture

In Kota Tinggi, 58 per cent of the populations are Muslim, followed by Buddhist (29 per cent), Hindu (7 per cent), Christian and others. It is a multi-cultural society, where the primary ethnic groups are the native Malays, followed by Chinese and Indians. Religion and culture are important aspects closely related to the issues of risk and the question of how risk can be differently perceived and how people's perceptions, attitudes, and behaviour influence their vulnerability to hazards. The World Disaster Report 2014 (Cannon and International Federation of Red Cross and Red Crescent Societies, 2014) describes the links between culture and risk, in which 'culture consists of beliefs, attitudes, values and their associated behaviours that are shared by a significant number of people in hazard affected places'.

### 4.3 Flood disaster in December 2006 and January 2007

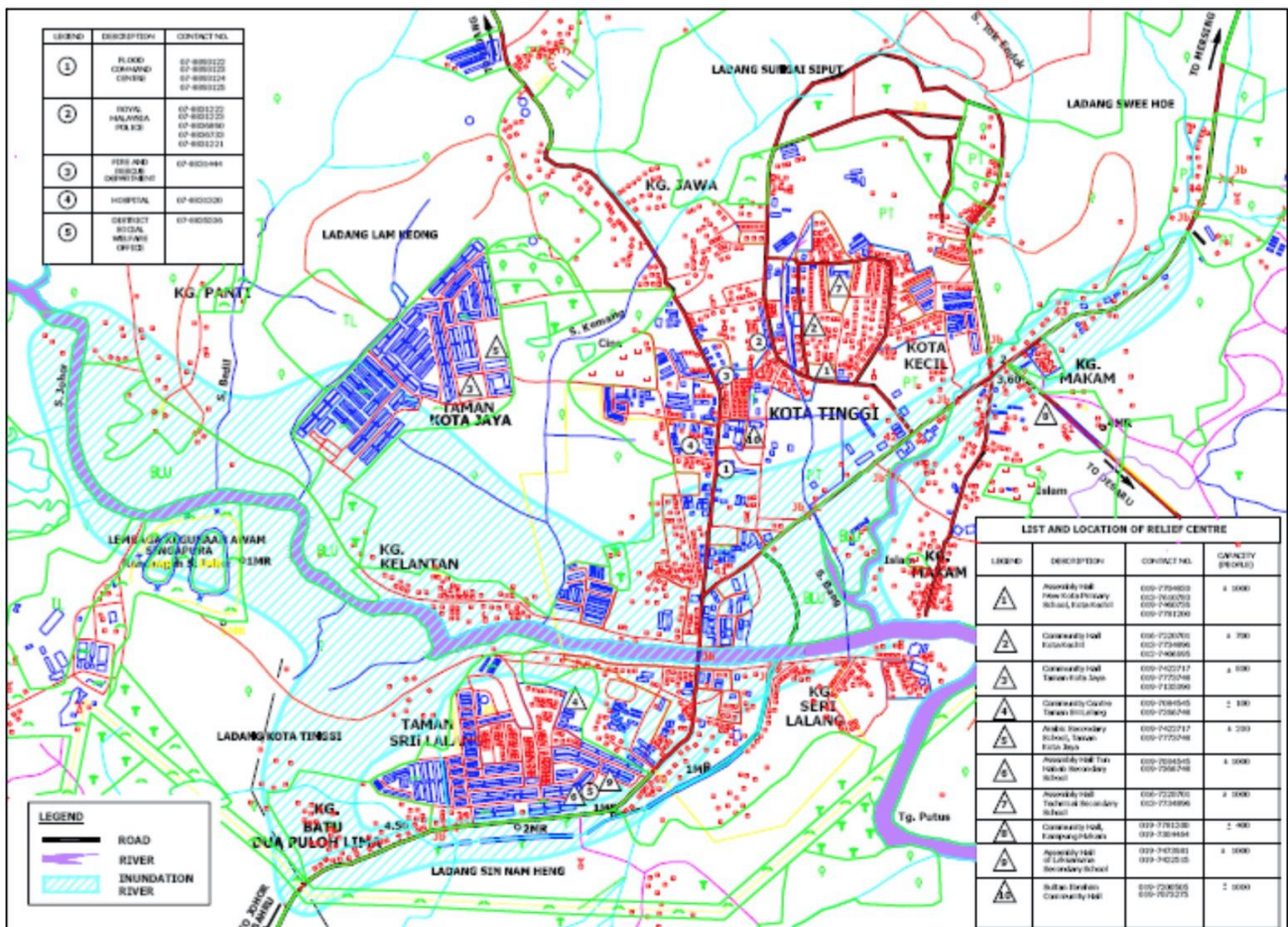


Figure 4.3 The flood affected areas in Kota Tinggi town due to flood in December 2006 and January 2007. (Source: ICHARM, 2007)

Kota Tinggi residents are accustomed to the possibility of flooding during the monsoon season and the resultant effect on their houses. However, in 2006-07, the floods were disastrous (Figure 4.3). The

flood struck in two consequential waves: in December 2006 and January 2007 in the southern part of Peninsular Malaysia. Johor, Melaka, Negeri Sembilan and Pahang were the four states that were affected during the floods. In Johor state, Johor Bahru, Batu Pahat, Kluang and Kota Tinggi districts were among the most affected areas.

The unusual floods of 2006-2007 resulted in substantial damage to people's lives and physical properties, and also to the economy. The 2006 rainfall return period was 50-years while the latter had more than 100-years of return period (J et al., 2012). The flood resulted in the evacuation of more than 100,000 people and a death toll of 17 people (MNRE, 2007b).

In the context of Kota Tinggi, this flood was associated with an unusual monsoon phenomenon that, according to the locals, happened once in 40 years. Earlier severe floods that had hit the town were those of 1948 and 1967-68. Nevertheless, the flood disasters in 2006-07 were proclaimed more extreme than before. This flood situation had a huge impact on the local society and has affected the local economy and socio-cultural life of the community. The floods were known as '*Banjir Termenung*' among the locals. '*Banjir*' is a Malay word meaning flood, and '*termenung*' is an act of daydreaming. This is because the floodwater was stagnant and took nearly 2 weeks to slowly recede.

The floodwaters came during the night and residents had not received any prior warning. The unusual 'first wave' of flood disaster hit Kota Tinggi for 13 days from the 19<sup>th</sup> until the 31<sup>st</sup> December 2006. The water rose by 2.3 metres above the riverbank level (ICHARM, 2007) and caused houses, commercial areas, clinics, schools, markets and banks to be swamped in the water. The affected people camped in the schools, community or multipurpose halls and mosques located at higher ground, which are normally used as relief centres during flooding.

Thousands of people had started to move back into their houses after the flood receded to start the process of cleaning and repair when the more severe 'second wave' flood struck for another 5 days from the 12<sup>th</sup> until the 17<sup>th</sup> January 2007 (Figure 4.4). The flood rose very quickly above the riverbank level by 2.75 metres (ICHARM, 2007) and with strong current the water level in the Johor River reached up to 5.45 metres. This resulted in overflowing water from the river and inundated the town again, including areas that had not been affected by the earlier flood.



Figure 4.4 Collections of flood scenes in Kota Tinggi town. (Credit: Yazidtim, 2007)

Residential areas and *kampung* along the river were badly affected, and at least 6 houses at Kampung Tembloh were swept away.

All districts administrative offices, schools, and factories were closed. Business activities were fully halted. Petrol stations were fully submerged so could not be operated. Lifeline services such as water and electricity, including telephone lines were damaged, hence shut down for safety and to avoid danger. This had forced more people to evacuate themselves back to the emergency relief centre. But due to the unprecedented scale of the flood, the relief centres were also flooded and shut down and the people had to move to the other relief centres. As a consequence, food shortages were reported because the centres had exceeded the maximum number of people they could cope with and furthermore there was restricted access for delivery of food supplies. The main bridge in the town that used to cross the Johor River was nearly inundated too. The sequence of unexpected flood events left the town 'paralysed' and people's daily activities were interrupted.

During flood events, all the allocated relief centres are under the responsibility of the Social Welfare Department to ensure that everything is under control; including (1) preparing and organizing evacuation centres, (2) food, clothing and other needs distributions, (3) carry out registration on the flood victim for the purpose of rehabilitation and (4) providing guidance, advice and counselling to the victims during and after the disaster.

### 4.3.2 Post-flood



Figure 4.5

(Upper left) One of the houses that was totally damaged during the flood.

(Upper right) House located near the river that is still standing after the flood – January 2007 (Credit: Yazidtim, 2007)

(Bottom left) The flood line shows the height of flood level in 1948.

(Bottom right) The 2006/07 floods were higher than the flood in 1948. (Credit: Yazidtim, 2007)

This flood disaster devastated the landscape of Kota Tinggi town (Figure 4.5). Rubbish was scattered everywhere, large numbers of cars and motorcycles were swept into the river during the flood. Roads were damaged. Shops and premises especially near the river had to close; banks moved their operation to a higher building level rather than having them on the ground level. The administration office buildings including the police station located beside the Johor River were relocated to a safer place. The flood line, which marked the highest level of the flood at that time serves to provide people, especially the locals with a reminder of the devastation a flood can bring. It imprints the most significant memory of local history into the physical fabric of the town, as a reminder that Kota Tinggi was once swamped and badly affected by the flood.

### 4.3.3 Relocation planning: Desa Sejahtera

Apart from these significant changes, the state government initiated a 'Relocation Program' to move badly affected people to a new

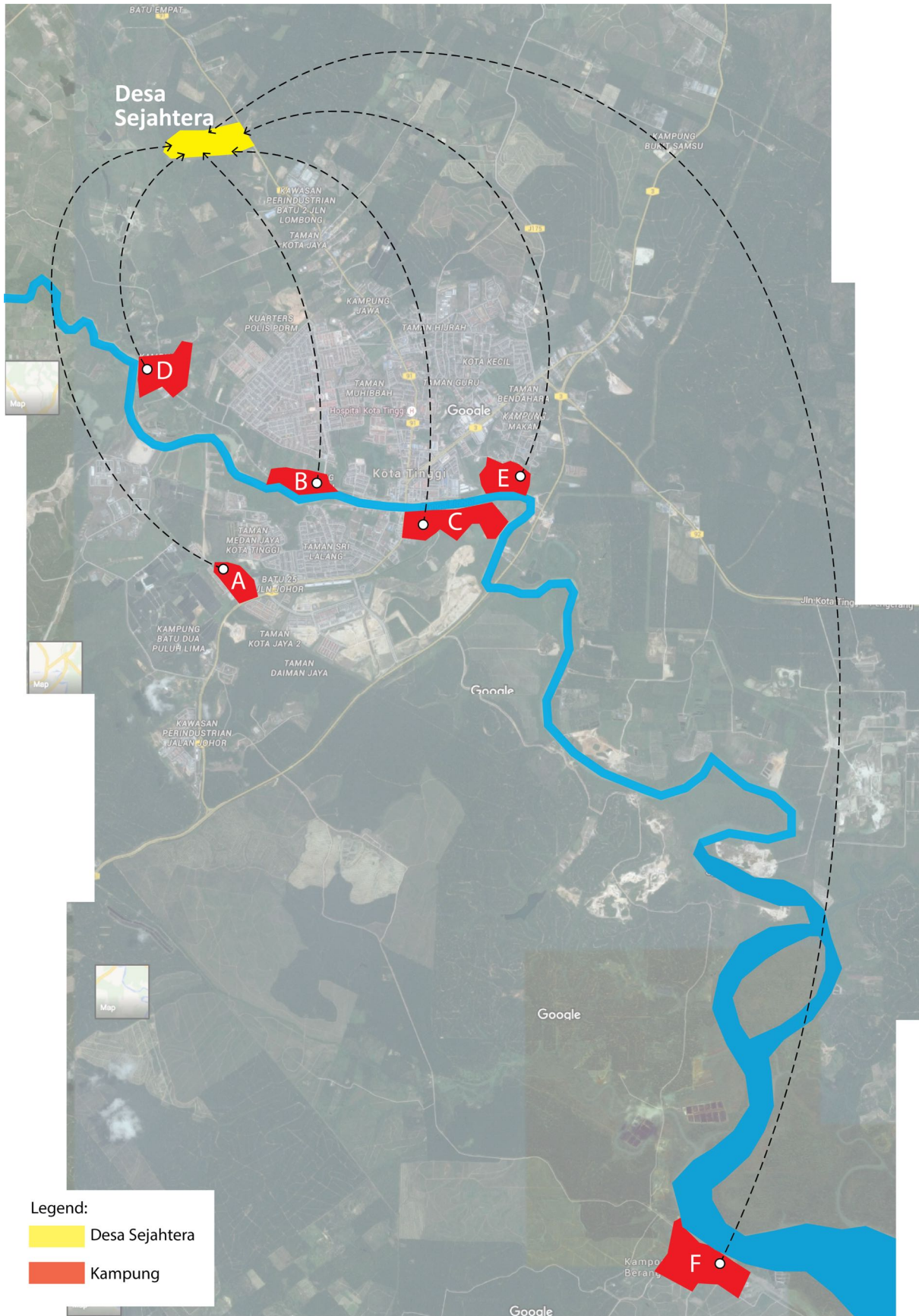


Figure 4.6 Map illustrating the location of existing of six *Kampung* (red) involved in the relocation program to Desa Sejahtera (yellow). *Kampung*(s) that were affected: (A) Kg. Batu 25, (B) Kg. Kelantan, (C) Kg. Tembioh, (D) Kg. Panti, (E) Kg. Makam, and (F) Kg. Sungai Berangan.

resettlement named Desa Sejahtera. This was a new resettlement area built to house flood victims who previously lived within the flood plain and areas vulnerable to flooding and also those who had lost their houses during the flood disaster. A total of 360 families from 6 *kampung* were identified and selected for this program. They were people from Kampung Tembiah, Kampung Kelantan, Kampung Panti, Kampung Batu 25, Kampung Sungai Berangan and Kampung Makam. These settlements, with the exception of Kampung Sungai Berangan, are unique as they are 'villages within the town', located by the Johor river but within reach or walking distance of the town centre.

The housing development of Desa Sejahtera (Figure 4.7) is located between 6 to 29 kilometres away from the existing locations of each *kampung* and Kota Tinggi town centre (Figure 4.6). In the year 2012, the government had appointed *Syarikat Perumahan Negara Berhad* (National Housing Council) to develop this project (MDKT, 2011). The development consists of 360 units of terrace houses and 10 units of shop lots (Table 4.1). Public facilities such as shop lots, a playground, a community hall and a prayer hall were provided too. The houses were priced at RM46,000 (£8,437)<sup>24</sup>, although the actual overall cost of each house was about RM120,000 (£22,011). The government had subsidized nearly 60 per cent from the cost of this project and the remaining cost was to be paid monthly by the residents for the duration of 25 years. At the end of the period, the residents would be awarded the house as well as the land of the plot.

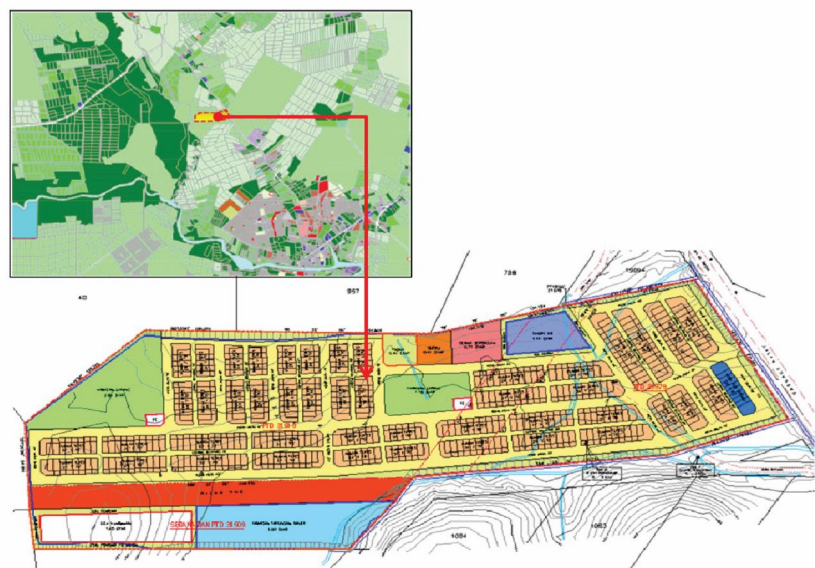


Figure 4.7 Desa Sejahtera, the new settlement due to Kota Tinggi floods in December 2006 and January 2007.

<sup>24</sup> £1 = RM5.45 (correct as of 16 September 2016)

<i>Kampung</i>	Family/houses selected
1. Kampung Tembioh	120
2. Kampung Kelantan	80
3. Kampung Panti	70
4. Kampung Batu 25	50
5. Kampung Sungai Berangan	20
6. Kampung Makam	20
Total	<b>360</b>

Table 4.1: Number of selected families from affected kampung being awarded a house in Desa Sejahtera.

The selection process for eligible families for relocation was conducted by the local Land and District Office in Kota Tinggi and was based on certain requirements and considerations. These included the condition of the houses in the aftermath of the floods- the houses were either destroyed or damaged. The land status issue was the most complex and important topic that needed to be solved. In this case, there were four circumstances of land status and the implications of ownership of the houses affected by the flood (Table 4.2).

Circumstances of land status	Implications of the ownership of houses affected by the flood
Houses built on the government's road and river reserved land	Houses were demolished. Each house owners were provided with a house at Desa Sejahtera
Houses built on the government's road and river reserved land and rented to others	Houses were demolished however the renters were not provided with a house at Desa Sejahtera
Houses built on their own private land	Houses remained, regardless if damaged or not. Fortunately, each house owners obtained a house at Desa Sejahtera.
Rented private land, where renters build their own house.	Houses remained however, renters were not provided with a house at Desa Sejahtera.

Table 4.2 The circumstances of land status and its implications of house ownership from all affected kampung in Kota Tinggi.

The relocation program started with gathering the names of flood-affected families and their eligibility by *Kampung* leaders and the Social Welfare Department of Kota Tinggi. The names listed were then forwarded to the Land and District Office Kota Tinggi for verifications and further actions. A few months after the selection process was completed, the government provided the affected residents with temporary stays or houses; this was especially the case for families whose houses were



destroyed or for those whose houses were built on the government's land. These houses were scattered within the town. Meanwhile, those who had their own land and whose houses had not been demolished were allowed to stay until the new houses were ready for them. This whole process of relocation took nearly 5 years to complete since the year 2007 and in the year 2012, the government finally handed over the house keys to the new residents of Desa Sejahtera.

Nevertheless, this **relocation program is hardly ever discussed or has been disregarded. There is also a lack of research with regard to the relocation programme and resettlement as post-flood recovery action, which was undocumented and lacks official records.** Therefore, the fieldwork was important to understand the condition in the settlement of Desa Sejahtera nearly a decade since the disaster. This was to observe and investigate the current situation after the community had lived there for 4 years. It was also to re-examine the thinking about resettlement issues due to natural disaster from the perspective of those affected, mainly those who are currently residing there.

#### **4.4 Revisiting Kota Tinggi in 2014 -2016**

I began my first fieldwork in Kota Tinggi in December 2014, observing the town especially within the affected areas (Figure 4.8). Infrastructures and developments such as commercial areas and housing are expanding outside the flood-prone areas bringing new character and quality to the local community. Nevertheless, the areas where commercial buildings were flooded especially near the Kota Bridge have +mostly remained closed. This has brought a new business of swiftlet farming<sup>25</sup> taking advance of the situation.

This was not my first time in Kota Tinggi as I was born, raised and lived there until 2007. It is therefore embedded in my own personal experience and memory, with a strong attachment to and sentimental value of this place, especially the town area. It is a small town that provides services and basic essentials not only to the people within the town, but the neighbouring districts as well as people from Kulai, and

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<sup>25</sup> Swiftlet is a type of bird (similar to house swifts, swallows or sparrows) and swiftlet farming in Malaysia, which started at around 1997-98 is a profitable business of selling its bird nests. The edible-swiftlet-nest is ranked amongst the world's most expensive animal products, usually due to its health purposes. The swiftlet farming requires a multi-storey house (typically 4 storey) made out of bricks and concrete.

Mersing, mainly during special celebrations or events<sup>26</sup>. The Johor River is a very significant feature of the town cutting across part of the Kota Tinggi that is mostly residential with the commercial shop houses. A significant ingress of the Kota Tinggi town that celebrate the visitors as they cross over the concrete bridge. Big shaded trees along the river create a calm and tranquil environment for the area. During that time, I used to stroll and cycle along and across the bridge to the town centre. Cycling across the bridge is always a fun experience for me, as I can feel the 'transition' between both parts of the river. People who approached the town from the southern part of the river were welcomed by rows of old shop houses at each side of the road that creates a vista. However, these scenes changed after the big floods occurred. The local authority had taken an action to improve the river edge by building up a retaining wall along the riverbank, which involved cutting down trees, flattening the land along the river.

My observations continued to the *kampung* associated with the relocation program that are situated near the Johor river including Kampung Tembioh, Kampung Kelantan, Kampung Makam, Kampung Batu 25 and Kampung Panti. It was quite emotional to see that these *kampung* that were established more than 100 years ago had lost their characteristics, appearance and environment. The *kampung* houses that were built and inherited from generation to generation were demolished due to the inappropriate location on the government reserve land. Some houses were left empty and covered with shrubs. Restaurants and shops were closed. Shop lots that were undergoing construction had stopped operations and were left abandoned. However, some people were still living there especially those who lived a distance away from the river, even though it had been designated as a flood-prone area (Figure 4.8 – Figure 4.21).

Thus, I started to question - what would be the main concern of residents that had experienced the floods as they were the ones with the closest connections with the place? How did they feel when they had to move from their houses during the flooding and then were relocated from their settlement and displaced to the new housing development? Did this change their culture, economy and lifestyle? I began to think about these

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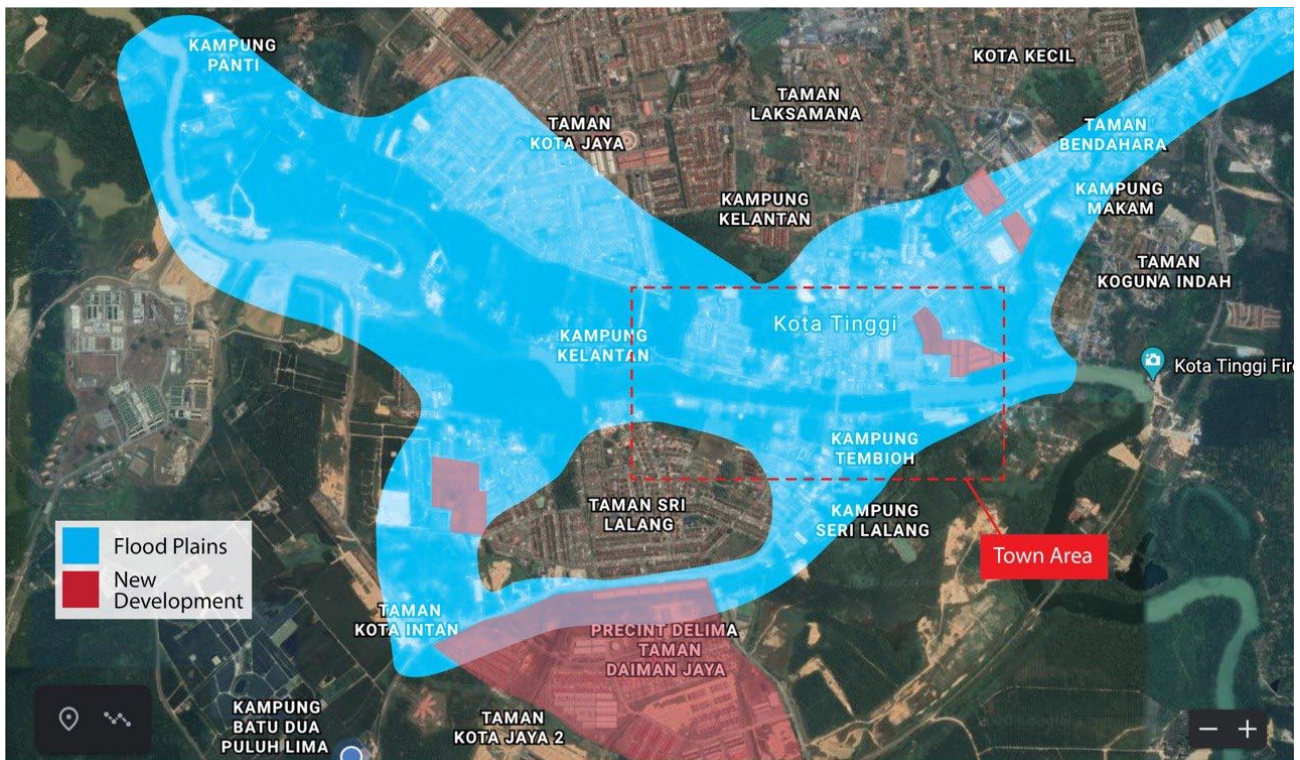
<sup>26</sup> Kota Tinggi serves as a place for shopping from nearby districts, as part of the city is well known for its local clothing and fabric shops called Kampung Kemboja. This is also due to the availability of some financial and services institutions that are absent in other places.

entwined relationships between space and time. This is a delicate and important aspect that needs to be understood by designers. At the same time, it raises questions of how to tackle the issues and what are the challenges that designers encounter when working in flood-prone areas or in post-disaster responses?

These fieldwork trips were especially important for many of the issues that I wanted to address. In order to gather the information and insights, I engaged with a number of people from the Desa Sejahtera community. The question of their experience living in both the new settlement and original *kampung* was addressed through the recorded interviews. These were distinct from my personal experiences and observations.

I re-visited the resettlement project at Desa Sejahtera twice between December 2014 and January 2016, nearly 4 years after the residents first moved in, in order to assess the present situation. As mentioned previously, interviews were conducted with fifteen respondents<sup>27</sup>. Limited by the number of respondents, this thesis will not be representative of all affected individuals or communities. The purpose

Figure 4.8  
Map of Kota Tinggi shows flood plain area (based on major flood in 2006/07) and new development (in red) after the major flood. There are only small number of post-flood developments within the Kota Tinggi town, including housing area (the biggest red patch shows in the map), and business development & shoplots (the small red patches)



<sup>27</sup> Refer to Section 3.3.3.



Figure 4.9 Location map for images references. Images shows the situation or development after the major flood in 2006/07.



Figure 4.10 (View 1) Historical location near the Sungai Johor river is still in good condition – the cemetery of Laksamana Bentan, who died in 1699, battled with Sultan Mahmud Shah II.



Figure 4.11 (View 2) Old shop lots built in 1928 are still empty since the major flood in 2006/2007. Buildings were inundated up to the second-floor level.



Figure 4.12 (View 3) Commercial shop houses – a significant ingress of Kota Tinggi town that ‘celebrate’ the visitors as they cross over the concrete bridge.



Figure 4.13 (View 4) Photos taken from the main bridge towards Kampung Kelantan and Kampung Pantii



Figure 4.14 (View 5) Panoramic view of Johor river. The town is on the left, while Kampung Tembioh on the left.



Figure 4.15 (View 6) View from Kampung Tembioh towards the bridge. The building on the left was a police station and now becomes Balai Kota, where they exhibit the building as a museum – experiencing prison environment, pop-up eating shops and playing areas for kids.

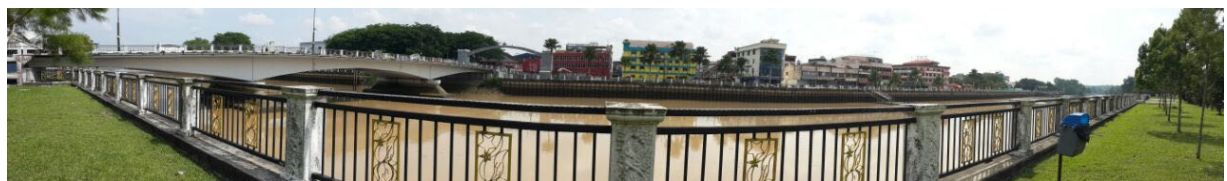


Figure 4.16 (View 7) Panoramic view of Johor river overlooking Kota Tinggi town.



Figure 4.17 (View 8) Panoramic view of Johor river from Kampung Tembioh overlooking Kota Tinggi town.



Figure 4.18 (View 9) Shop lots that were undergoing construction has stopped operations and were left abandoned.



Figure 4.19 (View 10) Public park along the Johor River



Figure 4.20 (View 11) Panoramic view of public park not far from Sungai Johor.



Figure 4.21 (View 12) Located besides Sungai Johor, the Buddhist temple in Kampung Tembloh is still operated.

of the interviews was to document genuine voices by listening to their stories, insights and experiences about this historical event and gather their perceptions on the relocation (Nor Izura T. and Tyszcuk, 2015). During the interviews, respondents were asked to provide information on the basic household features, their opinions on quality of life before and after relocation, and also the causes and effects of change on their daily lives.

My first visit to Desa Sejahtera was 'welcomed' by a row of empty shop houses facing the main road<sup>28</sup>. I found this quite surprising knowing that the housing development had been occupied since 2012<sup>29</sup>. The development was large and somewhat secluded from the other housing development nearby. There are public facilities provided at the centre of the settlement including a playground, *surau*<sup>30</sup>, nursery and a hall. There were five Malay wedding ceremonies held during my first visit - one was at the hall and the four others were organised at the front of their houses under rows of rented canopies that require road closures, which is common in Malaysia. The road is closed with permission from residents, for feasts and celebrations that last until the evening, which shows the extent of the cultural ceremonies and community cooperation continuing from the *kampung*.

Usually, family members and neighbours are invited for *rewang*<sup>31</sup> to help with the event preparations until the day of the ceremony. Various tasks are divided among the family and friends including cooking and preparing food, serving to the guests, washing dishes and cleaning. In

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<sup>28</sup> This is typical planning for housing developments in Malaysia, where shop houses have a visual appearance from the main roads in order to attract visitors from passing vehicles.

<sup>29</sup> It was told that a convenience shop had started operating but soon closed down. In my visits, they were rumours that a store will be opened soon, however, currently they were activities of night markets, which occasionally occurred. Often, the access road in front of this row of shophouses was used as parking for lorries or buses.

<sup>30</sup> Surau is a term widely used in Peninsular Malaysia for an Islamic religious building. It allows similar function to a mosque but on a smaller building scale and capacity. Comparable to the mosque, surau is mainly used as a place to perform individual or congregational five times daily prayer, Islamic classes and community activities, except for weekly Friday noon prayers usually conducted in a mosque and must be performed in congregation. Despite that prayer (individually or congregational) can take place anywhere as long as the place is clean, mosque and surau play a fundamental and pivotal role in the locality as a node; giving people opportunity to meet at regular intervals and thus come to know one another.

<sup>31</sup> Rewang is an adopted word from the Javanese language, used among the Malay community that represents the act of mutual assistance or community-based collaborative activity.

most cases, the family members or neighbours will give some contribution to the organizer, in order to ease their cost of organizing such event. The contributions vary from essential ingredients for the main dishes such as rice, meat and vegetables to money. In the area such as *kampung*, such an event usually takes place within their *halaman* or house compound. Nevertheless, over the years, the culture of 'rewang' has started to decline. Modern Malay society tends to prefer to organise such events in community halls and use catering services. This is due to limited communal space in new developments, as well as smaller roads<sup>32</sup> and limited parking space - and effectiveness in handling the events.

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<sup>32</sup> A two-carriage way of a typical street is about 5 metres width, hence it could fit two rows of 600-700mm width table arranged in parallel to the street. The arrangement should also take into consideration the length of the canopy structures, anticipating rain and direct sun in the afternoon.



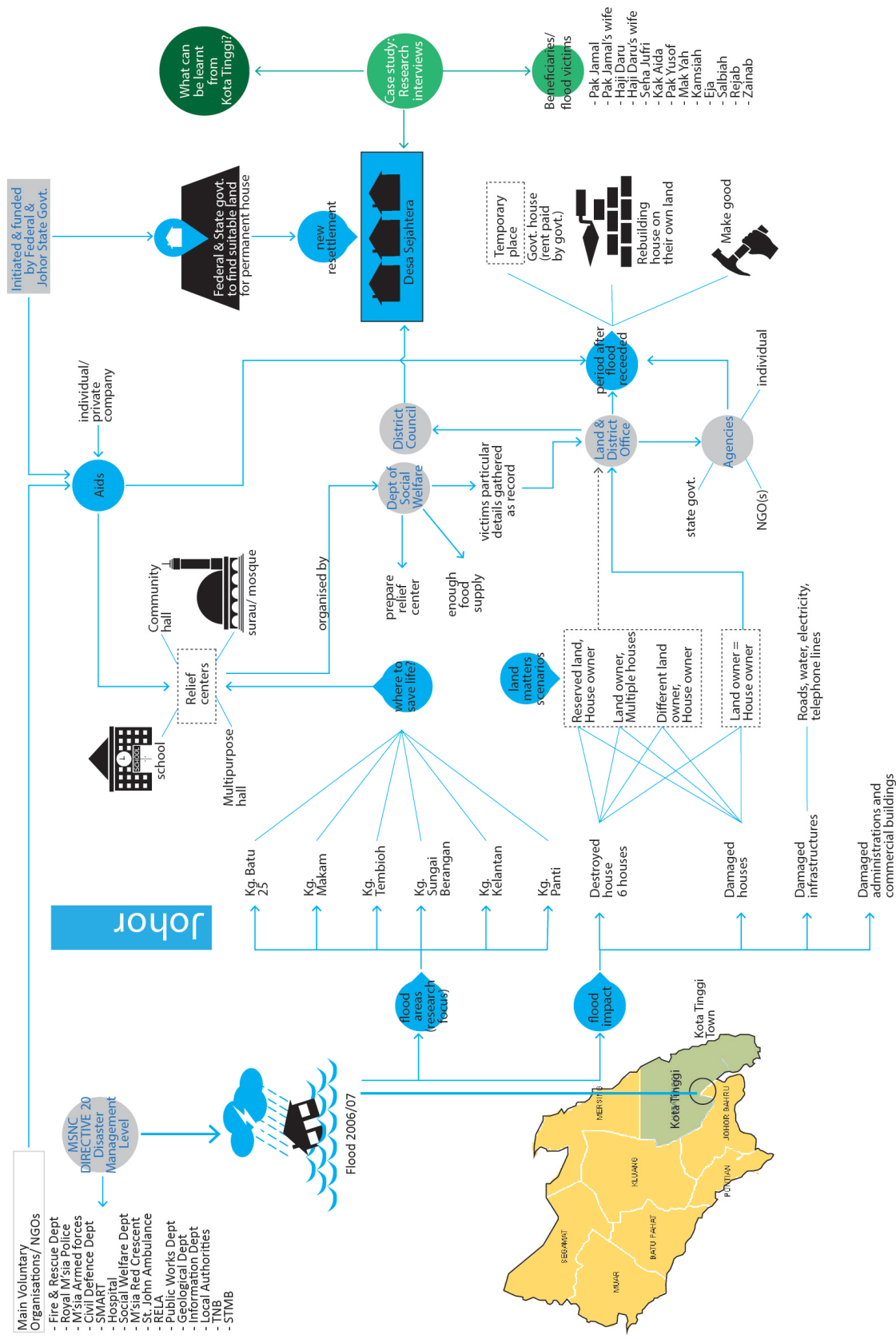


Figure 4.22 December 2006 and January 2007 post-flood in Kota Tinggi: Flow map Refer to Appendix 2 for larger scale format

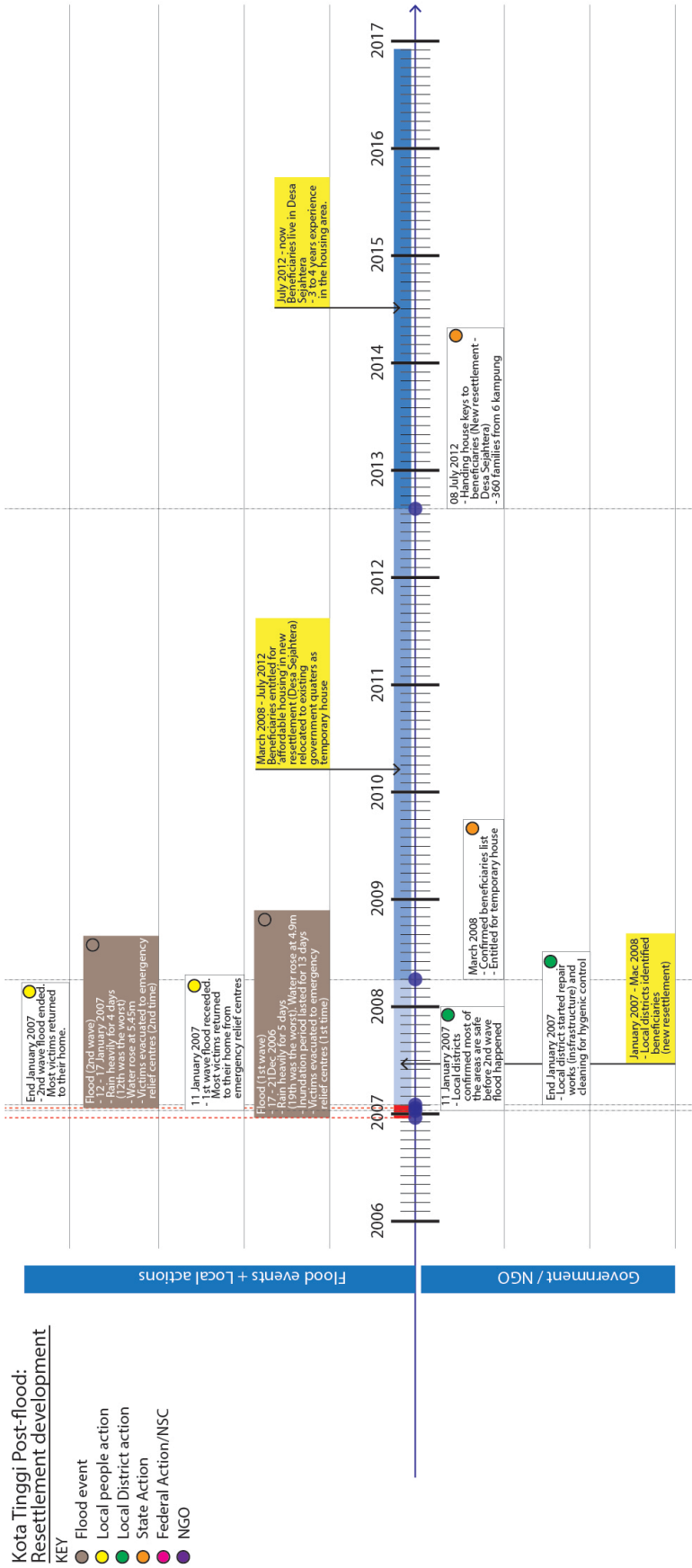


Figure 4.23 Post-flood recovery and responses timeline in Kota Tinggi from 2007 and beyond. Refer to Appendix 3 for larger scale format

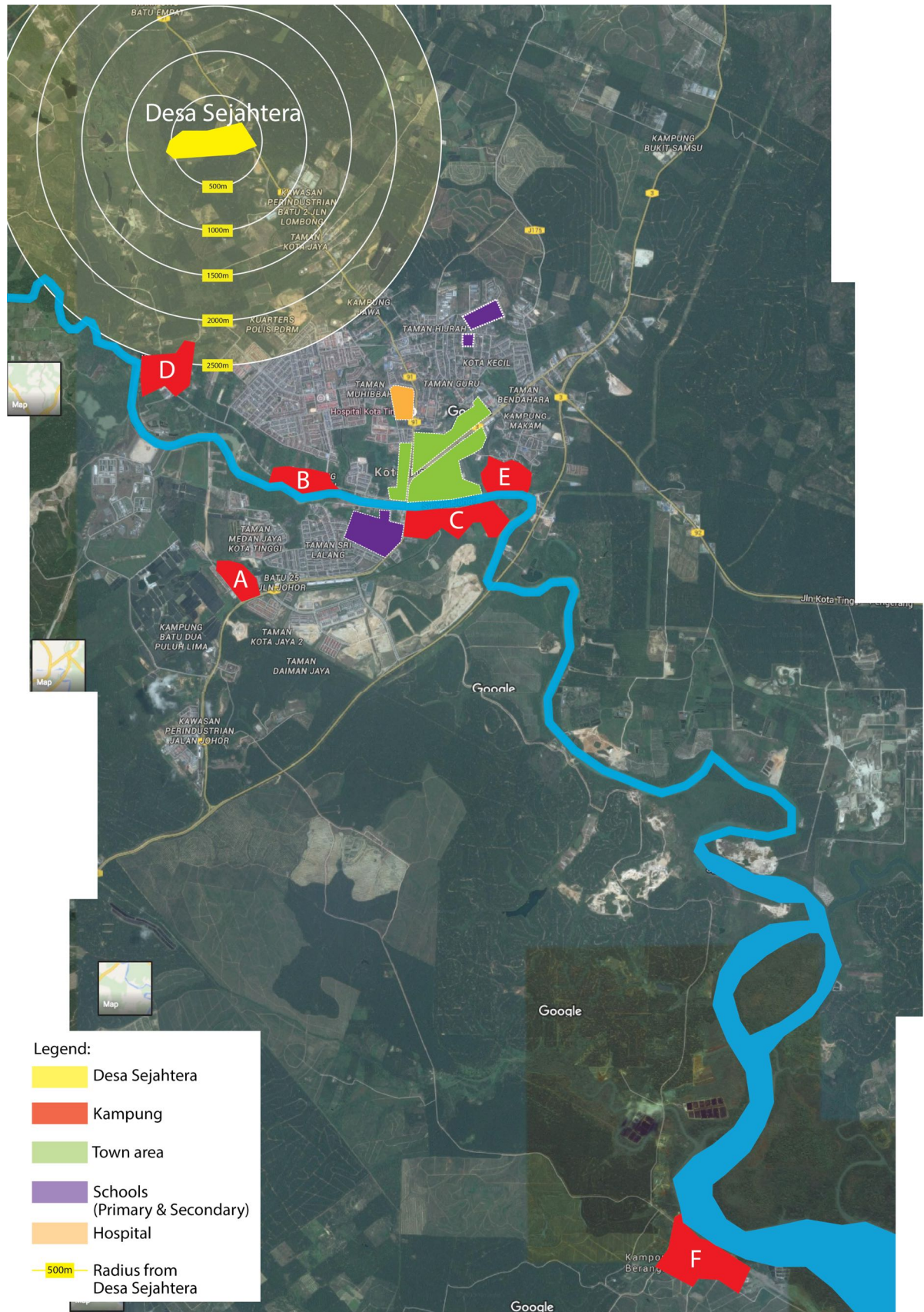


Figure 4.24 Map shows the distance from each Kampung to Desa Sejahtera, with 500m radius showing on the map as references. Kampung (A) Kg. Batu 25, (B) Kg. Kelantan, (C) Kg. Tembloh, (D) Kg. Panti, (E) Kg. Makam, (F) Kg. Sungai Berangan.

## 4.5 Fieldwork findings

The flood events of 2006-07 were among the most devastating disasters in Malaysia. The flow map (Figure 4.22) shows an overview of the process that the locals have to go through, throughout the phase of post-flood recovery and response. The flood resulted in the relocation of 360 badly affected families from 6 *kampung* to the new settlement - Desa Sejahtera that was approximately 6 kilometres away from their original settlement as per (Figure 4.24). Similarly, it shows the course of the resettlement before residents were finally moved in to their new houses. **The map also demonstrates the involvement of actors or agencies at different levels, starting from immediate to long-term response.**

The post-disaster actions took nearly 5.5 years from the flood event until the completion of the Desa Sejahtera in July 2012, as new permanent houses (Figure 4.23). Respondents informed that they were notified about the selection for the relocation program from March 2008, nearly four years before.

### 4.5.1 The flood experience

The respondents were chosen based on their experiences in facing several major floods. Seven of the respondents (P, R, Y, D1, S1, D2 and J) associated their experiences of two major floods in their lifetime, occurring in the year 1967/68 and 2006/07. All of them concur that such major floods rarely happened, albeit they have the impression that there is a possibility of a major flood to reoccur in the near future. Their opinion varies in terms of the flood strength and frequency and although the floods of 2006/07 had taken place nearly a decade ago, it was an unforgettable experience for the respondents (Nor Izura T. and Tyszczyk, 2015). Respondent KI from Kampung Tembiah described the flooding as unexpected and recalled how she had reacted to the flood events during the first wave flood in December 2006:

*“During the first day of flooding, my family and I decided not to go to the evacuation centre. We switched off the lights and stayed in the dark, so that the RELA<sup>33</sup> didn’t find us. But then, when the flood was getting worst, I personally felt regret with the*

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<sup>33</sup> RELA is an abbreviation for the *Jabatan Sukarelawan Malaysia* (The People's Volunteer Corps) a paramilitary civil volunteer division formed by the Malaysian government. They are normally tasked with law enforcement duty, security, and rescue

*decision we made. I thought that it was just a normal flood. It is unexpected and we never experience such big flood. Then, I swam to the [Kota Tinggi] bridge and asked for help. (...) The first wave flood, it was about 8 feet high. I can still see my house from far. Meanwhile, the second wave was about 14 feet high and everything cannot be saved. The current was too strong and it was too dangerous for us. I was glad that we went to the evacuation centre that time. (...) After the flood receded, we were not sure where should we start cleaning the house. My kitchen was washed away during the flood, parts of the main timber house were damaged..."*

Respondent PS and K, a mother and daughter, remembered the date and day of the flood as one of their family members had passed away the day before it happened. They were instructed to evacuate to a school during the 1<sup>st</sup> flood and moved to a community hall during the 2<sup>nd</sup> flood since the school was flooded too. Note that the house occupied by PS and K is a two-storey house out of concrete structures and timber wall panels.

*"It was a coincidence that my husband passed away on Manday, the day before flood and we were thankful that Allah ease everything for us. Everything was settled before the flood. The next day, the firemen came on a boat to our house and asked us to evacuate to the relief centre. There were 6-8 people in the boat. (...) My husband passed away on the 18<sup>th</sup> December. Flood was on the 19<sup>th</sup> December. The rain poured heavily for 2 hours and then flood struck. We stayed at the relief centre for a week. (...) I still remember Kota Tinggi was flooding in 1968. The town swamped up to 12 feet high. Our house was affected only at ground level, but we didn't go to the relief centre. So, we stayed at the upper level of the house until the water receded. (...) If compared to 2007 flood, the latest was the biggest. Flood event in 1968 was not as bad as in 2007 (...) In 1969; the main space in our house was saved. But this time was not. If you look at the kitchen, the water was just about one feet below the roof."*

Meanwhile, Respondent IJ from Kampung Panti who had resided there for 30 years explained that since she moved to Kampung Panti in the 1970s, the normal flood that happened earlier than the 2006-2007 floods did not affect her house. This is because the house was located on higher ground than other houses. However, the extreme flood of 2006-2007 had given her another experience that changed her views about

flooding as she was emotionally affected by the difficulty. In contrast to other respondents, she described:

*“...When the first wave flood struck, I chuckled and was overwhelmed when the flood entered our house compound (...) because I’ve never experience it before. At that night, the water rose higher, up to our knees in the house. And a group of armies instructed us to move out. (...) When the second wave flood struck, I was speechless and cried. There’s nothing left [of the house]. All [furniture and items] washed away. At least during the earlier flood, our stuff in the house and at the verandah were still there (...) The situation after the second flood receded looks like a tsunami. Numbers of cars were drifted away and stacked upon each other and were drifted in the Johor River. Houses were destroyed. (...) We didn’t manage to save our belongings except our important documents. We left our cat; I think she is already dead during the flood. Laptop, clothes and all the things inside our house were damaged. It was a total loss for us. (...) After a week the flood receded, the house still smells [of] strong musty smells. It took us around two months to clean the house until the smell disappeared. Since the incidents, whenever it rains, we felt scared and worried. Because our house was submerged up to the roof level and muddy.”*

After these flood events, the level of awareness among the respondents about flooding had increased. Whenever the rainy or monsoon season arrived, they often had difficulty sleeping as they felt the need to monitor the water level from time to time. This was to make sure that they were safe from flooding, as Respondent Z and D described:

*“When the rainy season comes, especially heavy rain at night, we did not sleep well. We always have an eye to the river.”*  
– Respondent Z

*“Every time flood happened, we felt worried. (...) We seldom have a good night sleep during the rainy (monsoon) season. The house needs to be monitored every now and then.”* – Respondent D

Based on the narratives from the respondents, I was aware that questions about their experiences with flooding gave a range of interesting responses. Recalling the flood situations, all of them expressed

their feelings of being alert but worried, and simultaneously their consciousness was animated when the heavy rains started to pour down for days as they could sense (primarily visual, but also based on experiences) that there would be flooding but were uncertain of how bad it would be. As the flood struck, they felt fearful and panicked but at the same time contemplated leaving their homes because they were concerned about the security of their houses as in the past, there were cases where issues of thieves were rampant during and after flooding. As described by respondent R, D and Y:

*“...Stubborn, we (the villagers) are all stubborn. We should act when the flood came, but we didn’t. We have not seen flood like this before, hence the slow actions. It was 18<sup>th</sup> December and rained heavily. Within few hours, the water level from Johor River had increased. We thought that the water will recede, but we were wrong. The water rose too fast and makes us panicked. Electric supply was cut-off. We were worried that animals from the river and riverbank such as crocodile, snake, centipede, and mouse will get into our house, as they want to save their lives too. We tied our car at the house structures, to avoid being drifted by the flood. The neighbours then saved us. During that time, the policemen and firemen were unable to help us due to the torrent of flood water...” – Respondent R*

*“I just built an attic for my house; therefore felt that it was safe enough to stay during flood. Furthermore, to make sure there’s no thief to my house. (...) At times, I refused to evacuate when the army asked me to go to the relief centre. An hour later the policemen came and one of them shouldered me and forced me out from the house...” – Respondent D*

*“I asked my wife and children to go to the evacuation centre on the day the flood happened. While I stayed at home and took care of the belongings and to make sure that everything is safe. However, when the flood was getting worst, a group of armies came and forced me to evacuate for my safety.” - Respondent Y*

One of them intentionally switched off the lights and opted to stay in the dark to avoid staying in the relief centre in the first place. However, they later regretted their actions as the flood rose higher than expected:

*“During the first day flooding, my family and I decided not to go to the evacuation centre. We switched off the lights and stayed in the dark, so that the army didn’t find us. But then, when the flood was getting worst, I personally regret with the decision we made. I thought that was just a usual scale flood. It is unexpected and we never experience big flood like that. So, I swam to the Kota bridge (main bridge to across the Johor River) and asked for help.” – Respondent KI*

They were then displaced to the emergency relief centres and highlighted that it was uncomfortable staying there due to limited privacy during the evacuation. Soon after the flood receded and people were allowed to return back to their houses, they felt emotionally sad and stressful knowing that it was not the same as before and thus anticipated that substantial work was needed to be done to get everything back to ‘normal’ again. This was expressed by Respondent KI and J:

*“After the flood receded, we were not sure where should we start to clean the house. My kitchen was washed away during the flood. Parts of the main timber walls were damaged...” – Respondent KI*

*“Often after a flood, if we went back to our house, we did not know what to do and where to start. Say if there are 10 items, only 3 or 4 items that can still be used.” – Respondent J.*

These kinds of mixed feelings that people went through reveal something of a more intangible process of adjusting and adapting to an uncertain situation. It is a complex situation, as they have to both rehabilitate from the catastrophe and continue to have concerns about further disaster in the future. However, the cycle of recovery makes them more adaptable and resilient through adjusting their lives to the new situation, although this may affect their financial circumstances and lifestyles.

#### 4.5.2 Indigenous/Local knowledge

While there are actions taken to notify residents within the flood-plain area by the local Department of Irrigation and Drainage, some respondents find that the indigenous or local knowledge is more useful to help them escape from flooding. Respondent Y reflected the traditional



environmental knowledge in the past that is still relevant. He described: *“The old folks said, if you could hear a loud sound like something exploded from the headwaters, then it is a sign of the flood coming”*. In addition to that, the respondents are highly dependent on their observation and awareness towards their surroundings, owing to the fact that this is used as a sign for them to prepare for unforeseen consequences of the flooding. Respondent Y elaborated that, *“When the rains fall continuously for 3 or 4 days, we have to start to prepare all our things and get ready to evacuate (...) this happened during the flood in 1969 and 2006/07. The ‘roaring’ sound that brought the water with strong current is scary.”*

Equally important, he explained that water tides might contribute to flooding and described: *“There are two types of water tides, one is normal water tide and the other one is big water tide,”* that is according to him the big water tide is also known as, *“air pasang keling”*<sup>34</sup>. He believed that the big flood in 2006/07 happened during the *air pasang keling* phenomenon, thus contributing to the unusual monsoon flood.

As mentioned in Chapter 2, the flood wisdom among the locals varies and depends on passing of knowledge through oral means, which may have been the same for the Kota Tinggi situation. The stories are specific to the local circumstances and are based on experiences of past flood occurrences. Nonetheless, while some respondents may have local knowledge on flood, it is merely to identify the nature of flood and as a warning signs for steps to be taken. However, most of the responses suggests that awareness of risks and the aspect of risk management contribute to the decisions made during the flood, in regards to their possessions (house, furniture, household goods) and the choice for the comfort of the house rather than relief centres. At the time, their personal safety is always compromised.

#### 4.5.3 Climate change and environment

As opposed to the scientific approach of understanding the climate change through modeling, the respondents demonstrated their understanding about climatic and environmental changes through their observations of and experience in their surroundings. Respondent R, who was a geography and history teacher, highlighted that the post-flood

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<sup>34</sup> *‘Air pasang keling’* refers to the biggest water tide (Dewan Bahasa dan Pustaka, 2005). During the *air pasang keling*, the water level of high tide and low tide is at its maximum difference of height.

impact was due to global warming. As he explained further the consequences after the major flood receded, *“the swamps within the flooded area started to dry, drought happened and most of the trees were dead due to drought.”* Additionally, Respondent R commented on some groups of people who take the opportunity from the post-flood environmental impact and initiated another development within the area. He stated that, *“...dried swamp areas were then bought as private properties, being reclaimed and they develop new buildings”*. He also elaborated on the action taken by the Kota Tinggi District Council to excavate and deepen the river as part of their mitigation strategies. This is due to heavy rains that brought both *“sand and soil from the nearest mountain and made stagnant in Johor River during the flood. Hence, resulted a shallow river (...) to the extent that people can [simply] walk across the river.”*

Respondent R believed that the flood was due to global warming and as a result of uncontrolled land management and exploitation of land resources. He added that the tree cutting activities done by the local council might contribute to flood impact too. He criticised: *“...When I told them to maintain the trees, they failed to see the consequences. But they told me that I know nothing about this”*. During the conversation, he was informed that, *“The water resources is decreasing from time to time. This is based on the research done by a university here. The population is increasing, in the year 2040s and 2050s, we will be fighting each other on the water...”* He then suggested, *“the Johor state government to produce a report every 4 to 5 years and distribute to the community living along the river, especially within the flood plain area”*, so that they will be more aware about the local environment, development and the way they manage the river.

This was agreed by Respondent KI, who believed that the flood catastrophe that happened was due to anthropogenic impacts on the environment. However, she pointed out that, people *“cannot rely solely on human scientific predictions,”* as she claimed that the prediction *“is still uncertain”*. An interesting aspect of the responses is that respondents agreed on scientific-backed argument but indicated the incalculable risks of climate change, that are beyond human control.

#### 4.5.4 Flood and the belief system.

Respondent KI associated the disaster with her religious beliefs and elaborated that, *“Only Allah (the Muslim God) knows what will happen in the future. (...) If you think back, the bigger destructions human made on earth, the greater Allah’s allegation towards us. You can’t make destruction to Allah’s creations and not to disturb our environment too much. In fact, we have to take care and appreciate them (environment). This is what I think; I am not sure about others. For example, at Desa Sejahtera, He didn’t send us flood, but He may send us strong wind. Sometimes, I prayed to Him not to send us any trial. We are only human, and Allah had given us more than we need. You can build as tall as you desire, or construct as many riverbanks as you want to prevent water, but if Allah willed it, it will happen”*. A significant aspect of the life of residents such as respondent KI are dependent on the Will of God or known as *Qada’* and *Qadar*<sup>35</sup>.

#### 4.5.5 Dwelling in temporary homes

Although the transit period lasted for years, only one respondent shared her experienced dwelling in a temporary house located within the Kota Tinggi town, while the other respondents mentioned that they stayed at their existing houses and those of relatives. According to E, the local authority provided the houses a few months after the flood struck.

*“After the flood receded, we moved back to our house in Kampung Tembiah because we have nowhere to go. We stayed there for about 3 to 4 months. Then, they [the local authority] provided us the JKR [Department of Works] houses opposite the hospital. It is single unit houses at the side of the road. Some of us stayed there, and some stayed at Taman Melati Putih. There few families rented a house at their own cost. [This is] because the houses were useless and not in good condition, some were washed away during the flood [...] For example, my mother in law’s house was drifted away, so she received a JKR temporary house too [...] The JKR houses are limited. Only 7 families including*

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<sup>35</sup> *Qada’* and *Qadar* is a known term used by a Malay person, derived from the Arabic term *al-Qada’ wal’ Qadar*. It literally means the ‘Divine Will and Divine Decree’ that the God Allah has bestowed upon the universe. As Allah is said to be the creator of all things, people’s actions are also included. Hence, it is believed that nothing happens in this universe without his will.

*my mother-in-law and my family lived there. The government paid the rent for us. We only paid for the water and electrical bills.”*

However, E pointed out that they were living in a state of uncertainty until they received a notification from the state government that they would be moved to Desa Sejahtera, a year before its completion.

*“I still remember after the flood, they [local authority] gave a form to apply for a permanent house. I didn’t fill in the form, but my mother-in-law did it for me. And then we wait. We lived there for quite a long period [...] around 4-5 years. [...] Until about a year before we get this [Desa Sejahtera] house, we just knew our name was in the list.”*

Living in temporary housing had been a big impact on E and her family, as her husband had to find a new job to suit the provisional situation.

*“Before the flood, my husband was self-employed. He took small contract jobs. The, when we moved to the JKR house, he worked with his father [...] as a lorry driver. Sometimes he had to travel to Cameron Highlands. After we moved here [Desa Sejahtera], he managed to find a job near the [Kota Tinggi] Waterfall, driving an excavator.”*

The interview conducted in Kota Tinggi discovered 3 different actions taken by the respondents during the transition in terms of dwelling. Most of the affected families stayed in their existing houses. Some of them stayed at their family or relatives’ houses. While, the remaining group stayed at temporary houses rented by the government.

#### 4.5.6 Desa Sejahtera

##### a) The planned relocation

*“Those who lived in the reserved river area do not have any choice but to live in Desa Sejahtera. Their houses are supposed to be demolished by the local council to deepen the river. However, some of them have return back to their original settlement, rebuilt the house and stayed there.” – respondent R*

b) Location: Distance from amenities

Although Desa Sejahtera (Figure 4.7) is about 6 kilometres away from Kota Tinggi town, the respondents agreed that the location of this new housing development is far from their original homes, livelihoods and work. This has initially caused difficulties with distance to bus stops and thus affecting the transport to schools, markets and job opportunities. Respondent Z mentioned that they could not rely on public buses, as they are only available every 2 hours - a route that connects Kota Tinggi with the Kluang District. Meanwhile, Respondent IY, ID, PS and S highlighted that it is far for them to buy groceries since the shop houses provided within the housing development are still empty.

c) Housing design and planning: House comfort

A number of respondents has expressed their concerns on the quality of the housing design and planning in Desa Sejahtera. They were unsatisfied with the lack of design considerations responding to basic necessities. This includes the spatial arrangements of spaces in the terraced houses, the type of material used and the level of privacy with the neighbours. Respondent R, a retired teacher, had high level of interest in design and architecture. He argued that the house unit of Desa Sejahtera was not fit for human inhabitants and described the design of the house as outdated. Spatial arrangements in their terrace house were very poor with insufficient openings or windows for natural cross-ventilation as well as natural lighting, especially in the bedrooms. Hence, the spaces designed had failed to provide appropriate comfort levels, thus making them impractical and unsuitable for daily use.

*“The house plan is outdated. But they (the authority) responded that I know nothing about this because I am not an architect. They can always ask other authorities or developer to share their design. They can even search from the Internet for a good design of a house. (...) The layout of this house is comparable to the 1960s house. There is no cross-ventilation, hence during hot days all of the rooms cannot be used. There are 3 rooms arranged next to each other. The first room has only one window. The second in the middle has no opening at all except the door. (...) Although I am now retired, I spent some of my time to study the layout of a few houses including this. I studied a low-cost housing layout in Singapore. It is 40ft x 40ft. The length for opening is bigger. That is why the ventilation is good. Our government is*

*busy giving houses to people, but they didn't really study the plan. I wonder who gave the design approval."*

Respondent D agreed on the issue of ventilation in houses of Desa Sejahtera. He added that the design and comfort is incomparable with his previous timber house that he built with other villagers and relatives in Kampung Sungai Berangan, which was cooler and more comfortable, as it was built on stilts. He explained: *"This house consists of 4 rooms including 1 for storage, 2 toilets - one in the master bedroom and another one is shared toilet. The size of the house is about the same as our previous house, but it is made of timber. We built ourselves with the help of our relatives; the house is cooler than this and more comfortable. It is on stilts and still in good condition until today".*

Similarly, Respondent R expressed his concerns about the distance provided within the house and between the neighbour that he considered as too near and narrow. As a result, it has interfered with their comfort level and privacy. As he explained: *"Another aspect that they didn't consider is the kitchen. It is too near with other spaces in the house and the back lane. When there is poor ventilation, the house becomes so hot and uncomfortable. Furthermore, the back lane is quite narrow; making the distance to neighbour's kitchen short. They are supposed to spare at least 6 to 7ft at the back of the house (...) they are very careless with this simple problem..."*

In response to these issues, Respondent R suggested that the future residents should be given a chance to be involved during the initial design stage to advise and propose their needs and requirements, as he expressed: *"It is good to provide houses for us, however I would suggest for the government and the local council to make a workshop or exhibition before they proceed with their spatial planning and design. So, we can give feedback on what we need and what to be improved."* He added, *"... avoid designing the rooms like this, kitchen to be designed properly with wider back lane and of course wider road at the front as we always have".* Concerning with the health issues, he added that the planning of this housing development has to consider and should pay attention to the demography of the residents, as most of them are from low-income groups with occupations such as lorry or bus drivers. He suggested that, *"there should be a specific place for them to park their lorry, so that we are not being polluted with the smoke from the lorry every day."*

#### d) Neighbourhood organisation

In spite of the fact that the respondents had agreed on the importance of having a committee to manage the community in Desa Sejahtera, such organization had still failed to be set up on the day the interview was conducted. Respondent R commented, *"We don't have any proper organisation here, to organize Desa Sejahtera properly."* He equated the Desa Sejahtera housing situation, *"like a cowboy town,"* and further stated that, *"they do have like a small organisation that focus on certain activities but not the overall management"*, administrating the whole Desa Sejahtera. This was concurred by Respondent D, who was once a *Kampung* Leader of Kampung Sungai Berangan. He responded that, *"I've asked other residents to form a committee, however there was no positive response from them. I am quite concern with this matter. For me, it is important, to make it (the community) more organize and easier to arrange any activities or events."*

From observations and feedback from some of the residents, the committee has yet to set up due to some issues. Aside from failing to reach a consensus on a 'leader', some residents with leadership posts from their original *kampung*, would not let go of their 'status'. That being said, my enquiry into the matter, anecdotally points to the relationship between these circumstances with the posts that they hold from political parties within the constituencies of their own previous *kampung*.

#### e) Waste management

A private company manages the waste management system in Desa Sejahtera. Respondent Y addresses that it is good that they manage the solid waste carefully as they come and collect rubbish every 2 days. He then compared the way he managed the waste when he was in the *kampung*, that was less controlled and regulated, *"One of the good things here is about the residential solid waste management. They come and collect the rubbish every 2 days. As compared to the kampung, I just dump the garbage in the backyard. Meaning they are more concern about the cleanliness and health. Sometimes, there is also a service to prevent mosquitoes..."*<sup>36</sup>. Agreed by Respondent K she shared her experiences dealing with waste when she was in the *kampung* as she had to dig the

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<sup>36</sup> Dengue related fever derived from mosquitoes is pandemic in tropical countries including Malaysia. In an event of such issues within a certain residential development, the areas will be 'smoked' with chemicals intended to kill mosquitoes.

soil and dump the rubbish there herself. However, Respondent S who was from the same *kampung* with Respondent Y, mentioned that garbage collection services within the *kampung* were only provided for those who had land ownership - a privilege for landowners possibly due to their tax payment.

Although the solid wastes are treated differently in their *kampung*, it can be seen that the system introduced for solid waste management in Desa Sejahtera is accepted and adapted by the residents since the state government had announced Desa Sejahtera as 'The Cleanest Housing Estate 2015' at Johor state level. This shows a positive collective responsibility of the residents and the local council towards the housing development.

f) Security and safety

Most of the respondents highlighted their preferences to stay at the *kampung* for many reasons; particularly their established relationship with neighbours, economy and being comfortable living in the *kampung* environment. Nevertheless, in contrast to the other respondents, Respondent J and IJ preferred to stay in Desa Sejahtera than their original settlement due to safety and security issues. As Respondent J reported that his previous house was in isolation from other neighbours, he claimed that Desa Sejahtera is more secure because they are close to their neighbours. He described:

*"...My house is still there. It was made of brick, but we don't have any plan to go back to Kampung Panti. It is a bit secluded from others but very near to the river. Today, someone has started swiftlets businesses around our house. So, we are quite worried of our safety. Because of these activities, we made our decision to move out from our house soon after we received the keys. We were the second family to move here. The other mostly moved in December 2012 during the rainy season." - respondent J*

Unlike Respondent J and IJ who felt more comfortable about the security level in Desa Sejahtera, Respondent S shared a different experience. She expressed her concern and linked the incidents with the absence of committee to help in managing the settlement. She expressed that:



*“Since we moved here, there are few theft incidents. There is no official committee being set up, hence it is difficult to form a ‘rukun tetangga’<sup>37</sup> to observe the area within”. - Respondent S*

#### g) Neighbourhood qualities

In terms of neighbourhood qualities in Desa Sejahtera, Respondent IJ expressed that different family backgrounds and environment reflected their attitude, responsibility and actions. She referred to the playground and described further that, *“When we moved in, the playground was in good condition. However, since more people started to move in from time to time, the condition is getting worse. In my opinion, some teenagers have less responsibility to take care of public facilities. They purposely took out the bolts and nuts from the slides and swings, and broke it down. It is dangerous for the kids”*. She pointed out that the incident was due to culture shock as she claimed that there are people that *“never experience living in a housing community”*, and therefore have less sense of shared responsibility. However, during my second visit between December 2015 and January 2016, the playground is in the process of being installed with the construction of new playground equipment.

Meanwhile, Respondent Z and KI shared their views on the cultural sensitivity of their neighbour, where they compared the situation in their *kampung* as more tolerant. Respondent Z was critical that her current neighbour, *“loves karaoke”* and as a result, she turned on loud music, therefore having less respect for others, as she quoted:

*“Our neighbour loves karaoke. The music is too loud and she didn’t respect others. No one dares to complain. She’s from other kampung”*.

Similar to Respondent Z, this situation was expressed by Respondent KI as uncomfortable and unfair. She informed me that she had to be cautious and careful with others, in order to maintain a good relationship with them. Respondent KI explained:

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<sup>37</sup> *Rukun tetangga* is a neighbourhood watch activity that involves patrolling the residential area throughout the night and until the morning. The residents themselves undertake the activity upon schedules agreed.

*“My neighbour has lost weight since she lives here. She once said to me that she is not happy staying here. The activity is too limited and passive. She felt unhealthy, because she just stayed at home doing nothing. There is a difference between living in housing area and kampung. In kampung, we were busy taking care of our compound, planting, and such. (...) I am lucky that I am working as a traditional masseur. So, I meet people. It is quite stressful staying here. Most of them are just staying in the house and not socializing. Furthermore, I think housing area is not as safe as kampung. You need to lock your house all the time.”*

Respondent D raised another issue about social interaction and attitude within the community in the development, but at the same time admitted that adaptation is crucial in living with the society, particularly in a modern residential development such as Desa Sejahtera. He claimed that in the *kampung*, people are always greeting each other. He classified the *kampung* as a “special place”.

*‘...To us, village is a special place. For example, if you are organizing a wedding ceremony, you can save a lot of money. Most of your neighbours and friends will come and help, and they even sponsor important things that will be used. But here, you may have to pay for everything. That will cost a lot. (...) We don't have any problem with others here. We try to adapt with other residents here as much as we can. We live in a society. 6 villages now become 1 big community; there are about 360 families here. If possible, we should not be divided.’ - Respondent D*

#### h) Employment and economy

According to respondent KI, *“Most of the residents in the kampung are self-employed such as hom-based business, selling food at the food stall, as well as a contractor. As for me, besides my job as a traditional masseur, I made Malay traditional cakes and foods, and send them to a few school canteens.”*

Having ground plots or allotments beside their houses in the *kampung* affects the way they sustain their daily life with low living cost and expenses. This is a marked difference to living in Desa Sejahtera, which restricts this possibility. The limited land has required higher living costs and prevented residents from developing modes of being self-sustained. The shop lots provided that are still empty during my visits have



Figure 4.25 Photos shows some of the home-based businesses in Desa Sejahtera including food stalls, mobile top-up, soap, groceries and tailoring.

affected the community. Thus, according to Respondent KI, the residents especially the elderly have to rely on the 'mobile grocery shop'<sup>38</sup> for groceries and other things. Respondent D and R highlighted:

*"We have our own allotments, and my wife sells homemade broom made from palm oil fronds for RM3.00 (£0.55) each. At least she has few activities back home. But now, she is not doing anything. There is not enough space for us to do planting and sell homemade broom sticks anymore." - Respondent D*

*"... most of the residents are poor people. I hope that at least there is one grocery shop open here. So that it is easy for us to buy groceries and stuff. When we were in Kampung Kelantan, it was easier and nearer. We can just walk to the town and buy all the things we wanted." - Respondent R*

*"Since the shop lots are not open, we always bought our groceries from a 'mobile shop'. The guy will come every day in the afternoon. However, the price for groceries that he sells is quite expensive. But we have no choice." - Respondent D*

Apparently, this has become an opportunity to the residents within this new settlement to start setting up small businesses from home (Figure 4.25). They sell food, mobile top up, sewing services, soaps, frozen foods, basic groceries such as sugar, salt, flour, eggs etc. Some even took the opportunity to open an eating-place within their house area. This according to Respondent IY, is one of the ways to help each other and for some of them to revive their business from before they were relocated.

#### i) Place attachment

*Kampung* is often described as a special place that has unique characteristics. It creates a sense of place and a sense of belonging that establishes a strong relationship between the villagers and their environment. Meanwhile, the new settlement of Desa Sejahtera did not convey the same sense to them. Nine out of thirteen of the respondents

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<sup>38</sup> The 'mobile grocery shop' is a common method of selling usually available in the housing area or *kampung* in Malaysia. It is a self-initiative from the seller with the intention to make groceries available for those who have limited access to market and grocer shops, the elderly and housewives. Thus, instead of going to the shop, it is vice versa. This mobile shop usually operates with a light goods vehicle including a van.

(P, K, R, Z, ID, Y, D1, S1, and D2) stressed that they would have preferred to stay in their village rather than be relocated to their current housing area. This is because their houses had been built by their ancestors, passed down and used for generations; hence, the houses were precious assets to them - emotionally and physically.

Respondent Y expressed that it is difficult to talk about the *kampung* as it has a sentimental value for him. He recalled the atmosphere of the *kampung* that is unique and incomparable to Desa Sejahtera. He recounted his experiences during childhood that related to the river, a common element within a *kampung*:

*“It was a beautiful kampung long time ago. We lived very near to the river. There were 13 families. Our ancestors built the houses for generations to stay. But that is not our land. It is own by the government. It’s a reserved area for the river. Those who lived farther than us, built their houses on their own land. (...) I used to bathe and consume water directly from there (the river) for daily use until 1984, before the Department of Irrigation and Drainage established a proper source of clean water. (...) There are few fortresses built within the kampung during the World War II in 1942. It is still there and has been conserved for tourism purposes. I like kampung because of its pleasant atmosphere. Every day, around 4pm, people from other kampung or housing area would come to play soccer and badminton. But since we moved here, the atmosphere is no longer the same. Now the place is full of shrubbery and it’s really sad.”*

As a consequence, the respondents reported that there were quite a number of families that had returned to the site of the original village, although they were aware that they would be vulnerable to flood events and uncertainty. This is also related to their individual ‘community attachment’ (Cross, 2001) that influences their experience in a new setting, as well as their feelings about the place. In contrast, the remaining two respondents (S2 and J) expressed that they preferred to stay in Desa Sejahtera due to their secluded house location from other residents at their *kampung* and thus felt unsafe to return.

Many people preferred to stay in the *kampung* and planned to move back there in two years time, due to three main reasons: (1) People in the *kampung* respect each other culturally and religiously, (2) The land size of the *kampung* residence is bigger than a house lot in Desa Sejahtera.

This encourages their interest in planting and farming, Respondent R and Z were sellers of fish, fruit and vegetables at the road side near their house where there were lots of customers, (3) The location of the *kampung* is nearer to the town and therefore accessible for them to buy daily needs and groceries.

*'...but we still love to stay in the kampung as we can do planting. We can walk to the town to buy groceries and other things.'*

#### 4.6 Discussions

This study discovered several issues with the relocation process to Desa Sejahtera in 2012. The interviews conducted during fieldworks in Kota Tinggi revealed that there are 4 types of situations that have occurred within the planned resettlement. (1) Some of the people planned to return back to their villages and keep their house in Desa Sejahtera as a retreat for the monsoon season (2) Others stay in the resettlement housing and rent the house in their village or vice versa, (3) Some have sold the house and returned back to the village (4) The house in the village had been demolished by the local council due to it being illegally built on the river reserved area, thus the inhabitants had no other option except to stay in the resettlement area (Nor Izura T. and Tyszczyk, 2015). The study shows that respondents were informed of the risks that flooding caused but nevertheless planned to return to the *kampung* in the main because they were **unable to establish a feasible livelihood in Desa Sejahtera**.

The research fieldwork and observation shows that housing solutions given reflect as what Silva (2011) expressed as the ideal of the 'providers' (state government, donors and designers), rather than true needs or functions of the relocated community and their culture. Thus, providing for many, an unwanted outcome that underprivileged this specific community due to inaccurate understanding of their needs and desires. Nevertheless, it does not mean that the designers can simply 'evoke their original settlement settings and visual appearance' (Silva, 2012), as to re-create a familiar place for the community. As Silva (2012, p.117) elaborates, such misconception 'indicates the fact that the designers do not possess the type of knowledge required for handling resettlement planning and a framework of guiding principles'. Hence,

**requiring a critical thinking of the way design and planning of resettlement is conducted and produced.**

Throughout the fieldwork the research has discovered key issues that need to be explored. In regards to neighbourhood qualities in Desa Sejahtera, the residents highlighted that various levels of acceptance and tolerance of people from each *kampung* (their original settlements) need to be acknowledged by referring to their primary locality. This is due to the merging of six *kampung* to form a large and uniting community in Desa Sejahtera. The respondents expressed that the level of acceptance and tolerance within a single *kampung* had been developed and adapted; and for that reason, they understand their neighbours very well. This established connection or mutual understanding is therefore claimed to be incomparable by the respondents.

One of the respondents suggested a community-led design approach or a participatory design strategy, which is more suitable to understanding the users' needs and desires. There are three essential components that contributed to the success in resettlement; community building, community empowerment and incremental development, which concerns the meaning attached to housing provision.

The availability of social and private living spaces in the new settlement is one of the most critical concerns highlighted from the respondents' narratives, which compared unfavourably with their previous *kampung* living. Their views on adaptability within the new environment are strongly related and compared with their earlier experiences of living in their original settlement - demonstrated by their constant reference to past living experiences prior to Desa Sejahtera. The limitation of a transitional or an intermediate space such as a house compound or *halaman* in their current homes, in Desa Sejahtera is recounted to have affected and changed their quality of life. Maliki et al (2015, p. 608) highlighted that the '*halaman* is seen as a connection for users or dwelling of a house to the earth, as such it represents a rich and culturally essential aspect of the life of the respondents'.

In the *kampung*, people had more control in personalizing their space, where they have available ground plots for gardening vegetables and fruit, and keeping animals such as goats, cows and chickens beside their houses but, at the same time maintaining closeness with their neighbours – mostly free from any disputes. Illustrating the direct and personal authority in the decision made upon their livelihoods and of

others. The characteristic of a *kampung* house that is normally fenceless makes it flexible in the functions of space and creates a collective ownership within the neighbourhood. Hence, it increases direct and intimate interactions among *kampung* residents, which is driven by the informal agreements and tacit understandings created between them.

Desa Sejahtera, however, has limited areas for green spaces. Although residents are able to personalize their spaces it does not afford them room to allow for gardening vegetables and fruit or even attending a livestock. Planting spaces are confined within the separating barrier in between these terraced houses, barely covering half of the available spaces compared to concrete flooring. Furthermore, fences built at the front and back of the houses have created physical and psychological boundaries that distance them from their neighbours. These rigid and inflexible physical environments show a strong statement of ownership and significantly impact their way of life<sup>39</sup>. My conversations with the respondents show that it was quite stressful to live in this kind of housing area since it has limited their daily activities and interactions. As a result, it has transformed the community into a passive neighbourhood. They have started to set their own personal space, eventually ignoring their surroundings. Many felt disconnected and isolated and this has resulted in feelings of insecurity and distrust.

In the interview with Abu Samah in January 2016, he pointed out that *kampung* house was an expression of pride and had significant meaning for the *kampung* resident, since the house was resided in by generations of families. Thus, the inhabitants build a strong attachment to their houses and refer to them nostalgically in comparison with their new settlement in many aspects. In addition, the inadequate design<sup>40</sup> of the new settlement has resulted in poor ventilation and natural lighting that is not suitable for inhabitants in this region and has further disappointed the residents.

Resettlement is a complex process and in the case of Desa Sejahtera, is particularly difficult since the people were accustomed to living in the *kampung* for a long period of time, some throughout their

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<sup>39</sup> A narrative within terraced housing in Malaysia had always been related to the culture of individualistic lifestyles rather than a societal or communal living as in *kampung*. For more of these arguments see Tajuddin Rasdi, (2006) Housing Crisis: Back to Humanising Agenda.

<sup>40</sup> This is according to the respondent's general opinion and as per the author's judgments and anecdotal evidences from the site visits held.



whole life span. **Some of the families' association with the *kampung* has stretched over many generations and consequently they felt deeply rooted in their locations.** In many ways, **living with the occurrence of regular flooding had influenced their standpoint in the historical patterns of intervention and architecture.** They also have a set pattern of life which they cherished and were reluctant to change (Chan, 1995). Some have established themselves with particular self-employed jobs or land-based occupations that make them unwilling to relocate to other places. **Such 'involuntary' resettlement to an 'alien' environment in the middle of nowhere, involving the upheaval of people and their livelihoods, may thus also provoke social disruption.** Many attitudes and values of the Malaysian people and their *kampung* way of life have been acquired over a long period of time. *Kampung* has a broader meaning, which encompasses home, familiar surroundings, relatives and neighbours and is the focus of life and activities, ranging from farming practices, to communal rites, social functions and religious rituals (Nor Izura T. and Tyszczyk, 2015). Resettlement schemes need to take into account the social values and attitudes of *kampung* residents and the extent to which they can be reoriented towards living in a new place - similarly in the contemporary context.

It is important to note the differences between existing *kampung* and Desa Sejahtera, in order to provide a holistic view of the respondents' experiences of living in both their previous *kampung* and currently occupied planned resettlement (Table 4.3). The findings suggest that there is a need to pay greater attention to these issues when planning resettlements of large numbers of people within a post-disaster area in Peninsular Malaysia. In considering the number of families relocated to the new settlements such as Desa Sejahtera, this research highlights that comprehensive **planning and design - in accordance to its content and context, plays an important role in gathering communities together.** There should be a **consideration towards the continuation in the sense of place, a sense of belonging and a sense of values.** The research also suggests that **re-housing and resettlement design is compelled to respond not only to the people's need but also the inherent resourcefulness, upon which is distinctive to their own cultural background. In addition, discussion** or negotiation between the agencies; local council, policymakers and architects with the 'end-user' is necessary before proceeding with projects for planned resettlement. It is important

	Kampung	Desa Sejahtera
Management	Each of the villages have their own organisation to manage the village and were happy to accept them as a representative.	Lack of proper organisation as 6 villages had become 1 big community. Residents could not make a resolution among themselves, while some previous representative of <i>kampung</i> were reluctant to surrender their former posts.
Location	Five out of six villages were within the vicinity of Kota Tinggi town. Easy access to public transport and walking distance.	Location is further from the town, school and market. Lack of public transport (buses are available every 2 hours). Thus, limited access.
Economy	Self-sustained and low living costs. Have their own allotments for fruit, vegetables and live stocks on land owned by them.	High living cost. Limited piece of land preventing them from being self-sustained. Shops have not yet opened and therefore have to rely on 'mobile shop' for groceries although it is quite expensive.
Socio-cultural	Active social interactions since everybody knows each other. It is easy to greet others.	Passive social interactions - the terraced houses creates physical and psychological barrier.
Safety	Most of the respondents claimed that their village is safe and they have control over it.	Few of the respondents claimed that the new settlement is safer than the village. However, improvements were needed before they could move in, such as adding door and window grills.
Architecture and planning	Timber-house layout is much preferred and comfortable. Trees were an important element that they missed. The houses were built according to specific spatial needs and identity.	Small and limited space. House renovated to fit their spatial needs and identity- although restricted. Ventilation and natural lighting are crucial issues.

Table 4.3 Respondents' experiences of living in both their previous kampung and currently occupied planned resettlement.

that the 'end-user' presides over the decision-making and responsibilities within the resettlement project from its initial conception to post-inhabitation. It is similar to a community-led participatory design approach where people felt they are part of the solutions rather than what was imposed upon them.

Moreover, the results of the research acknowledge Bankoff's (2001) argument that different belief systems view disasters in different ways and furthermore find many different ways of coping with extreme events - ways that make sense to one culture may be at odds with the plans of policymakers and governments.

Silva (2012, p.117)) argues that it is 'the understanding of the attributes of vernacular processes of housing' that 'truly facilitate the creation of successful resettlement', rather than 'the formal attributes of local houses'. This research emphasises the importance of ensuring that resettlement communities are both socially and economically stable as well as physically functional in an infrastructure sense. Hence, the **research suggests that it is important to consider ways of reflecting the values of the *kampung* spatial environment.** This would see the new resettlement projects to potentially accommodate various cultural activities in gathering areas, provision of allotments for growing crops to reduce living costs and enable the possibility of self-sustainable lifestyles, as well as the creation of smaller resettlement communities for easy organisation of the new village, as well as to encourage active social interactions such as the mutual assistance (*gotong-royong*). Thoughtful design consideration of spatial arrangement of the house is mandatory to provide comfortable living space such as the adaptation of passive design strategies: use of sustainable and functional materials, day lighting, shading and natural ventilation.

This research has argued that a more holistic perspective is required to understand the causes and consequences of flooding, displacement and planned resettlement in Malaysia. While projects for resettlement of communities out of floodplains meets both the objectives of development and adaptation measures of governments, there are many ways in which resettlement does not take account of residents' views and experiences.

This study also warns against the way in which a 'dominating construction of climate change as an overly physical phenomenon readily allows climate change to be appropriated uncritically in support of an expanding range of ideologies' (Hulme, 2008, p. 9). Technical responses that view resettlement as an issue of simply providing adequate housing and infrastructure are often tied to political ideas of 'development'. At the same time, they obscure the important indigenous knowledge of adaptation to climate change.

This research calls for a thorough investigation in the adaptation measures while providing more attention to the aspect of political and the discursive dimensions. Full awareness of the various impacts of resettlement in Malaysia in the context of climate change is important for architects to understand how it might be possible to both continue 'living with floods' and encourage 'living with resettlement'.

During the fieldwork conducted between December 2014 and April 2015 in Kota Tinggi, an unprecedented flood disaster struck in some parts of Peninsular Malaysia, particularly in Kuala Krai at the East-Coast state of Kelantan. This recent flood event became an opportunity for me to discover and understand the scenarios of relocation from the immediate responses while also reflecting upon the question of what are the architects' roles in post-disaster recovery? How can architecture contribute in rebuilding the community in the new resettlement? Seeking answers to questions of how architects might respond to these challenges in a changing landscape led me to participate in a seminar and workshop organized by Mercy Malaysia in March 2015, in Kuala Krai. This is the first related workshop I attended, three months after the 2014 flood disaster occurred.

#### 4.7 Building community & settlement resilience workshop

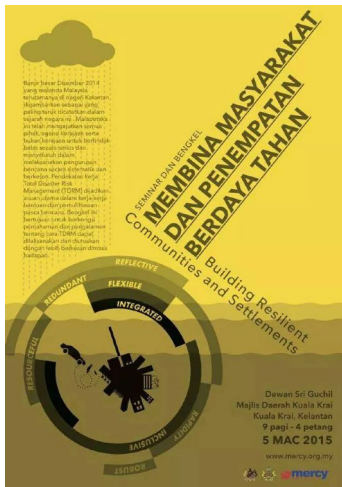


Figure 4.26 Seminar and workshop organised by Mercy Malaysia on 5th March 2015

The Mercy Malaysia workshop (Figure 4.26) was aimed at exchanging the experience and understanding of the Total Disaster Risk Management (TDRM), making sure its implementation and organization remains effective in the future. The seminar and workshop were divided into 4 agendas including Governance and Coordination, Resilience Settlement and Resilient Community presented by representatives from different backgrounds, which were mostly architects, local authority, National Security Council (NSC), NGOs, and academicians.

Interesting topics focusing on the Kuala Krai flood disaster were discussed such as the model and mechanisms of managing the post-flood rebuilding, lessons learnt from the flood disaster, preparedness, theoretical approach towards resilience architecture and society, as well as a case study of rebuilding after the earthquake in Yogyakarta, Indonesia.

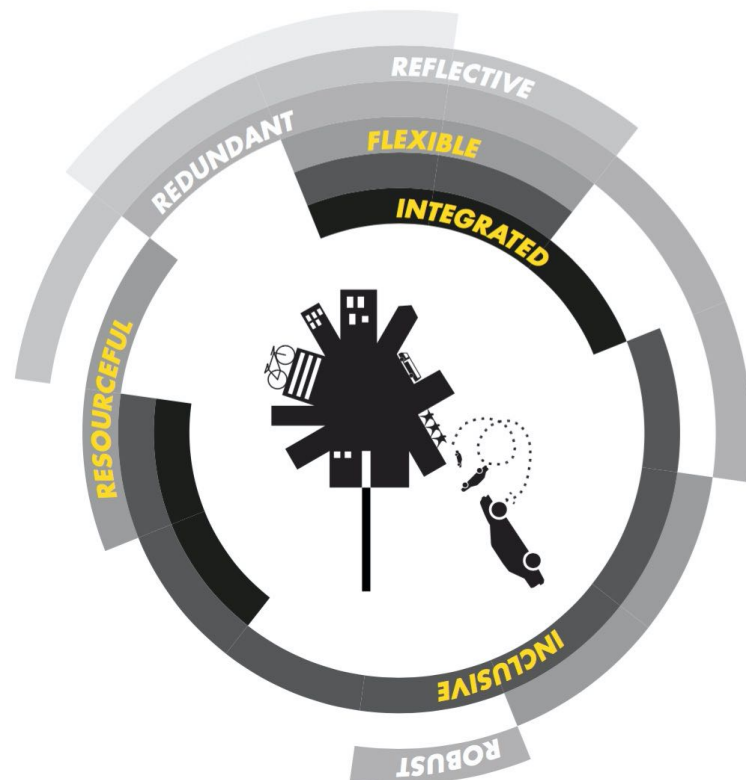


Figure 4.27 Seven global targets in achieving city resilience. (Source: Hafiz Amirrol & EXTRAURBAN Design).

Norazam Abu Samah from Mercy Malaysia highlighted that “*locals are the first responders*” of a disaster, where he presented a topic on resilient communities and explained its connection with the ability of communities to cope with disasters (indicating the level of vulnerability) and the time taken to bounce back (recover) after the disaster occurred.

Moreover, their ability relies on two important aspects: the physical components such as buildings and infrastructures, and their preparedness. Meanwhile, resilience within a city scale as presented by Hafiz Amirrol, an architect from EXTRAURBAN Design, highlighted seven factors that are correlated (Figure 4.27). These are described as reflective, flexible, inclusive, robustness, integrated, redundant and resourcefulness.

In another instance, Eko Prawoto, an Indonesian architect, presented a case study of the Kampung Ngibikan reconstruction in Yogyakarta after the earthquake in 2006 that had been shortlisted for the 2010 Aga Khan Award<sup>41</sup>. He put forward his views on the local people's essential qualities that still persist even after the disaster, which I found to be interesting and worth mentioning;

*"Kita sebagai orang luar melihat konstruksinya hancur, kita rasakan semuanya hilang. Tetapi ini tidak betul. Sekalipun bangunan fiziknya hancur, tetapi sebenarnya bangunan sosialnya still very much intact and you have to respect it."*

*Translation:*

*(We, the outsiders, see the constructions were severely damaged and we felt that everything is gone. But it is not true. Even though their physical buildings were destroyed, but their social structure is still very much intact and you have to respect it).*

Eko's principle of seeing the locals "as subjects, rather than objects," underlines three aspects that every architect should consider in order to rebuild the community after the disaster successfully. This includes (i) their social structure, (ii) their cultural value which according to Eko; architects should avoid altering people's lifestyle during difficulties and, (iii) maintaining the spirit of togetherness with regards to their traditional custom and culture. This is akin to Hafiz's view that, "people in such difficulties should have the same rights in receiving a good, delightful and high value aid such as houses." Moreover, Hafiz justified that providing transitional shelter throughout the post-disaster recovery

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<sup>41</sup> The Aga Khan Award for Architecture (AKAA) is a prestigious architectural prize to identify and reward architectural concept that addresses the development of local Islamic communities. Established in 1977 by Aga Khan IV, this three-year cycle award not only recognises architectural structures but the people involved. See more: <http://www.akdn.org/architecture>.

and responses, such as the Perkampungan Mercy Tualang (PMT) by Mercy Malaysia is as relevant.

Eko's suggestions emphasise the importance of working closely with the locals, as resonated by Mustapha Kamal, who is also an architect and a representative of PAM<sup>42</sup>. Although Mustapha considers design as rather "*personal*", he suggests design to be developed by local architects, as they may have better understanding of the needs, aspirations and geographical situation of that particular place.

Recognising the post-disaster situation as an opportunity, Fairuz Reza Razali, an academician and an architect, expressed his views that architects or built environment professionals, "*have to make the design more practical and [be] brave enough to try it out (explore).*" He raised the issue of the potential of improvisations that could possibly be done and highlighted the importance of documentation or actual records in the form of a, "*data bank [that] is essential for future references and [in turn, the] design with local specific will be easier as we have [supported] references and documentations.*" He further suggests that discussions with locals are important throughout the initial planning process up to the building construction period in order to provide the flexibility to accommodate design improvisations while adapting within a specific context. Syed Zainal Abidin, one of the representatives from NGO, also expressed a similar argument that a good coordination between government agencies and NGOs is necessary and therefore concurred to Fairuz's suggestion to set up a data bank for references in future disasters.

In regards to the rebuilding of permanent houses in existing land plots and resettlements, Tengku Azmi Jaafar, a government district officer of Kuala Krai highlighted that the Ministry of Works Malaysia has directed a guideline for permanent house construction, which Syed Zainal Abidin justified as, "*adequate, to avoid local sentiment where some may envy others,*" due to differences in house design and size provided by funders; - either from the government or NGOs. In addition to this, he addresses that the aid should be in both physical (shelter, food, daily necessities) and spiritual forms (emotional or moral support).

The unprecedented 2014 flood in Kuala Krai has led PAM to propose the formation of MDPC (Figure 4.28), a one-stop coordination

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<sup>42</sup> Pertubuhan Arkitek Malaysia (PAM) or Malaysian Institute of Architects is the national professional institute representing architects in Malaysia.

service in the event of disasters. Various stakeholders will be involved, including NSC, government agencies, NGOs, professionals, academicians and researchers. PAM also put forward a proposed timeline strategy for relief efforts divided into four sections: immediate-term, short-term, medium-term and long-term. The timeline was designed to accommodate a 5-year planning strategy to tie in with the cycle of the *Malaysia Five Year Plan*<sup>43</sup> approved by the Malaysian Parliament (Figure 4.29).



Figure 4.28 Proposal on Malaysia Disaster Preparedness Centre (MDPC) by Malaysian Institute of Architects as one-stop coordination service in the event of disaster. (Source: PAM, February 2015)

Figure 4.29 Proposed recovery timeline by PAM in MDPC, presented during the workshop. (Source: PAM, February 2015).

<sup>43</sup> Malaysia Five Year Plan is a planning document for Malaysia economic development exercised every 5 years- to maximize efforts.



The Workshop was productive as the topics discussed were very much relevant to this research that questions the architects' role in post-disaster recovery. I concluded four main key points gathered from the workshop pertinent to the focus of this study:

- 1) The rebuilding process to a large degree was about the collective efforts where community engagements are an essential requirement in the aspect architectural responses. As a result, the outcome is to provide local resilient specificities.
- 2) To acknowledge the distinctions between social or community perspectives with the architects' capacity as the technical team in designing spaces, rebuilding post-disaster communities and increasing their resilience. Architects have to understand and respect the aspirations of the affected communities.
- 3) The affected community should be treated fairly and as a 'subject' rather than 'object' as rebuilding the community is in fact a thoughtful process rather than focusing on the end product per se.
- 4) Detailed and explicit data bank (ideally architectural) and documentation are imperative for reference of future disasters in Malaysia.

As a researcher, I am aware that flood disasters may often recur, although the scale and impacts are uncertain. The 2014 flood disaster affected thousands of people involving the relocation process into new permanent houses. The case study Desa Sejahtera in Kota Tinggi is appropriate in addressing the issues of resettlement through architectural contribution although contextually distinct. Nonetheless, the insights from Desa Sejahtera could potentially be introduced into the discussion and address some of the issues within the unprecedented flood in Kuala Krai 2014. The next chapter will review and reflect on the post-flood situation on the ground and evaluate its recovery and responses as necessary.

The research continues to follow up with two of the speakers introduced earlier - Norazam and Hafiz - in an open-ended interview session and within a series of workshops conducted for further discussion.

*“Flood in Kelantan is not called ‘Disaster’ because it happens every year and people are ready for it”*

*- Professor Dr Mafauzy Mohammad, 2015*

#### 4.7 Conclusion

It has been brought to the attention of this research that the post-disaster relocation and resettlement programme in the Malaysian context is hardly discussed and offers limited references. Though the relocation programme by the government aimed to help in mitigating the effects of the flood on communities, the fieldwork conducted suggests otherwise. The development and inhabitation in the new settlement of Desa Sejahtera in Kota Tinggi indicated some critical issues within the new community that had to be addressed. This study was done through the respondents’ narratives as well as through my research fieldwork, observations and reflections.

Based on the story of Kota Tinggi, the study concluded four key points. Firstly, the relocation programme is a complex process as it involves both physical and psychological interventions. The involuntary relocation from a familiar place (which people felt attached to but had lost as a result of disaster), and the move to foreign environment and surroundings, leads to disrupted livelihoods and social interference. As a result of the involuntary displacement, the relocation strategy requires careful interpretations in the design and planning of resettlement for future post-disaster victims. Apart from providing them with physical habitat, careful considerations have to be made in the aspects of culture, environment, and their original livelihoods. These aspects are key to them feeling at home in their new settlements.

Secondly, as anticipated, it is identified that the respondents in Desa Sejahtera had distinct views and expectations on the outcome of the permanent housing provision provided by the local authority. Inadequate preliminary studies of multiple *kampung* in order to understand specific community needs, desires and culture has led to an inefficient housing solution and unnecessary design outcomes, eventually depriving them of their physical and psychological needs. As a result, the new settlements according to the respondents are impractical to their livelihood prompting some to return to their *kampung*, in spite of the risks that future flooding may pose.

Thirdly, in the process of rebuilding the community, the flood-affected community should be treated as subjects, rather than objects with passive voice. Their opinion and voices in relation to the resettlement should be weighted fairly, as they are the first persons to experience the disaster. The process should be treated with respect taking into account their local and cultural essential qualities that still remain even after the disaster.

Finally, the long period of rebuilding the community throughout the transit time is identified to be an opportunity for a suitable platform in providing a testbed for the exploration of possibilities in the aspect of design and strategies, socially and more notably in the aspect architectural advancements.



# Chapter Five

## Fieldwork Two: Stories of Kuala Krai, Kelantan & Negotiation with Architects

### 5.1 Introduction

During the first period of fieldwork conducted between December 2014 and April 2015, Malaysia was struck by a flood disaster on the east coast of Peninsular Malaysia. This unexpected disaster was a personal shock to Malaysians, including me and it influenced the subsequent trajectory of this study. It was important to include my own experience of this disaster in order to understand the situation and its consequences as they unfolded post-disaster. I therefore decided to visit Kuala Krai, located on the east coast of Malaysia in the state of Kelantan, a settlement affected by the flood disaster.

This chapter documents and illustrates the fundamental issues and questions of temporary homes in transit time; through the story of fieldwork conducted between March 2015 and January 2016 in Kuala Krai. Similar to the Kota Tinggi case study in Chapter 4, it will briefly outline the history of flooding in Kuala Krai and post-flood recovery and responses following the flood events in December 2014. This information was gathered from websites and official reports from the government and NGOs, journals, and media coverage. The chapter gives an account of the flood by drawing on a range of narratives and experiences from the local inhabitants affected by the disaster. It draws attention to insights on intangible, social and cultural aspects of people's lives during and after the flood that have, up to now, not been well presented in the literature of flood response and resettlement. The chapter discusses the challenges to the provision of post-disaster relief within the transit period, as well as the architects' role and relevance in this transit time.

I visited Kuala Krai twice - the first time was in March 2015; 3 months after the flood event and the second was in December 2015, exactly a year after the disaster. During these periods I was able to experience and observe the post-flood situation and interview the locals who had experienced the flood first-hand in December 2014. Many of the

insights presented in this chapter are drawn from conversations and accounts gathered during my visits.

This chapter is divided into 3 sections. The first part provides a background to Kuala Krai, describing the geography, demography, population, economy, infrastructure, culture and religion, the generally history of floods in Kelantan and in Kuala Krai town specifically. The second part is regarding the flood event in December 2014. Scientific data, journals, official documents, media coverage as well as first person narratives of experiences of the flood, will be the main source for what had happened during the flood period. The third part focuses on post-flood disaster recovery and responses. It explores how people develop resilience and the ways in which an architectural strategy can contribute to rebuilding communities after the disaster. In this section, data was collected mainly through observations, first person narratives and also interviews from experts involved in recovery in the aftermath of floods.

The chapter concludes with a review of the current discourse and the insights discovered and acknowledged through the research on the unprecedented flood event from locals and built environment professionals - architects and designers. The cases of Kota Tinggi and Kuala Krai and their relevance for thinking about approaches to transit home and transit time are discussed further in Chapter 6.

## 5.2 Kuala Krai, Kelatan: The background

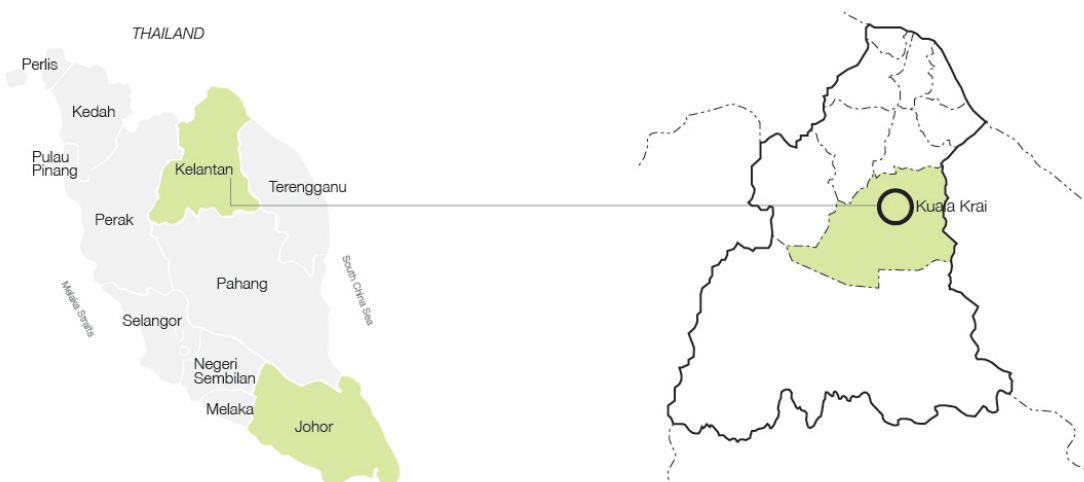


Figure 5.1 Location of case study in Kuala Krai highlighted in Kelantan State map (right) and Peninsular Malaysia (left)

### 5.2.1 Geography and flood

#### **GREAT LOSSES IN KELANTAN. A 1,000 LIVES LOST.**

From the meagre news that leaks out from Kelantan says a correspondent of the Pinang Gazette it would appear that the flood which swept down the Kelantan river and overwhelmed the villages in the valley was of a most devastating kind. The water rose to a height of 40 feet over the banks, some say 60, and more than a thousand lives were lost. The death roll may sound incredible, but considering that the total area of the State is almost unexplored forest while the population confine themselves to the banks of the river and the adjacent low-lying areas, the wonder is that more lives were not lost.

**Enormous Loss of Cattle.**

Figure 5.2 Great Losses in Kelantan. Newspaper article highlighted the lives lost due to the flood in 1926 (*The Singapore Free Press, 1927*)

Kelantan is a state located in the northeast of Peninsular Malaysia (Figure 5.1). It is internationally neighboured by Thailand in the north while locally bordered by the state of Terengganu in the east and Pahang in the south (DoSM, 2016). Kelantan is divided into 11 territories that covers the area of 15,105 km<sup>2</sup>, with a population of 1.68 million in 2013 (Kelantan State Government Official Portal, 2016). Kelantan is geographically separated from other states within Peninsular Malaysia due to the mountainous Banjaran Titiwangsa<sup>44</sup> that crosses its borders. Kelantan has two important rivers, which are the Sungai Galas (Galas River) and Sungai Lebir (Lebir River) - that merges with the main Sungai Kelantan (Kelantan river), which then flows to the South China Sea.

A majority of the population in Kelantan are vulnerable to floods, especially during the northeast monsoon season that occurs annually between November to March (Yahaya et al., 2015). The geographical location of Kelantan, adjacent to the coast of the South China Sea, and its exposure to the winds of the Northeast Monsoon are considered the main factors causing the flooding.

Flooding, also known as '*bah*' is a common phenomenon in Kelantan, as it happens nearly every year. Since the year 1900, Kelantan has been severely hit by three major floods; the first was in 1926, known as '*Bah Merah*' or '*Red Flood*' (Figure 5.2), a second in 1967 and the latest in 2014. These three flood events had become a milestone in Kelantan's history. Local residents who live in the low lying areas or flood prone areas tend to be aware of the possibilities of flooding especially during the monsoon season (Chan, 1995). However, the scale of the flood events varies and remains uncertain.

Kuala Krai is the second largest territory in Kelantan (Figure 5.3). This territory is governed by 2 district councils, which are Kuala Krai District Council and Dabong District Council. Kuala Krai territory has its historical importance as one of the earliest districts formed during the

<sup>44</sup> Banjaran Titiwangsa (Titiwangsa Mountain Range), also known as Banjaran Besar (Main Range) by the locals. Starting from the southern part of Thailand, the range is extending about 480km length towards Johor, the southern state of Peninsular Malaysia. It forms as the 'backbone' of Peninsular Malaysia and acts as a natural divider between the east and west region of Peninsular Malaysia.

reign of the British in 1909. This research focuses on the area of Kuala Krai town that is governed by the Kuala Krai District Council.

According to the Kuala Krai Regional report (2012), the hilly geographical characteristics of the region, has limited the capacity for large scale development which has become one of the constraints for the development of its town, especially in providing good facilities and infrastructure. Kuala Krai is a unique town which has developed in an area where two rivers, Sungai Lebir (Lebir River) and Sungai Galas (Galas River), flow towards the main Kelantan river. Hence, this area is especially prone to flooding during the rainy season or monsoon season when the rivers will overflow. Therefore, the Kuala Krai District Council report, has identified the town as an area prone to annual flooding. Although this is the case, large scale flood disasters have been a rare occurrence.



Figure 5.3 Kuala Krai territory is divided into 3 districts - Batu Mengkebang, Olak Jeram and Dabong. Kuala Krai town is located in Batu Mengkebang District. (Source: MDKK, 2015)

### 5.2.2 Culture and heritage

The economy of Kelantan is predominantly based on agriculture especially rice, rubber and tobacco (Kelantan State Government Official Portal, 2016). The state however, is better known for Malay handicrafts including '*batik*' and '*kain songket*'. Batik is a 'silky garment woven with intricate patterns', while '*kain songket*' is 'a cloth made from gold and silver weave thread, mats, silverware and paintings' (Kelantan State Government Official Portal, 2016). Besides, woodcrafts, kite making, and



many traditional arts made from '*mengkuang*'<sup>45</sup> leaves and rattans is widely produced in Kelantan. Subsequently, tourism becomes a growing industry as more people flock to see and experience the rich Malay culture that is still being made, preserved and inherent in the lifestyles of Kelantan people.

Kelantan, known as the 'The Cradle of Malay Culture' (Kelantan State Government Official Portal, 2016), or the Malay enclave, is 'generally regarded as the most conservative and traditional among Malaysia's states' (Raybeck, 1992, p.326). It is famed as a 'repository of Malay cultural beliefs and practices that are indigenous to the state itself or which once existed elsewhere in Peninsular Malaysia but have since died out' (Raybeck, 1992, p. 326). Kelantan has a unique culture, cuisine, dialect and lifestyle that are quite unlike any other in Malaysia. Ninety-five per cent of Kelantan's population are Malay and the remaining are Chinese, Indian and others. People of Kelantan or Kelantanese presents a 'high level of assimilation between races' (Daud et al., 2016, p. 112) to the extent that not just the Malay culture being accepted but being adapted by other groups of races such as the Chinese and Indian. For example, the Chinese may be known by a Malay name within their community, like 'Awang (Malay name) for Ah Yuan (Chinese name), Hussein for Chong Seng' (Daud et al., 2016).

In Kuala Krai territories, Kuala Krai town mainly functions as an administration and business centre. It is the most developed district in the Kuala Krai territories. Nevertheless, the majority of people in Kuala Krai still live in *kampung*. There are 227 *kampung* recorded scattered across the Kuala Krai district (MDKK, 2012).

### 5.2.3 Religion in Kelantan

Kelantan is known as '*Serambi Mekah*' or Corridor of Makkah for its large number of Muslim learning centres from the early 1900s. Today, 95 per cent of the population in Kelantan are Muslims (all Malays are Muslims) and therefore, Islam is the most influential religion in the state. On that account, apart from the Islamic practice, this has also influenced their political and daily social interaction. This usually can be seen in the conception of time that refers to the Islamic daily prayers - that differs from the clock-oriented time.

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<sup>45</sup> Any of various large South-East Asia screw pines, which yield leaves that can be woven into matting (Oxford Dictionary) or craftworks.

According to Raybeck (1992, p. 328), traditionally, the Kelantanese who live in the village divide the day in a 'formally ordered by the cycle of five Islamic daily prayers'<sup>46</sup> rather than the mechanical clock. The prayer<sup>47</sup> periods used as 'a common daily markers for time, are structured in a loose style' that promotes flexibility rather than a precise approach of mechanical clock to appointments. Alatas (1977, p. 91) pointed out that though the time arrangement is rather flexible, they 'observed the time scrupulously'. For example, a person may agree to visit his neighbour, promising to come before Zuhr, which the timeframe referring to early or mid-morning or even mid-day (Daud et al., 2016; Raybeck, 1992). This is quite common in daily conversation not only within the Malay Muslims in Kelantan, but also within the non-Muslim community. In fact, this is also a common scene in the conversation for most of the present Malay society. The Islamic practice by the Muslim people therefore influenced their views on and acceptance of flood disaster.

### 5.3 Flood Disaster in December 2014

The December 2014 flood that struck four states in Malaysia was unprecedented in both its scale and its outcomes. It was defined as a level III disaster that was the worst flood event in Kelantan state (Azlee, 2015; Wan Ahmad and Abdurahman, 2015) and Malaysian history (Yahaya et al., 2015). Kelantan experienced the 'most severe and suffered the greatest damage'. Eight of its territories were badly affected including Kuala Krai (Wan Ahmad and Abdurahman, 2015, p. 341). The flood forced as many as 160,000 residents in Kelantan to relocate, which was recorded as the highest number of registered evacuees. 1251 families lost their houses, and the death toll was 10 as recorded on 29 December 2014 (eBanjir, 2014; MERCY Malaysia, 2015).

A 5-day long intense period of heavy rains from 14<sup>th</sup> to 19<sup>th</sup> December 2014 resulted in a massive water surge into the tributaries of Sungai Galas and Sungai Lebir rivers, forming a bottleneck at Sungai Kelantan (Figure 5.4), worsened by the tidal impact from the coast. As a result, rivers overspilled beyond the riverbank and inundated some areas such as Gua Musang, Dabong, Manik Urai, Kota Bahru and Kuala Krai (Yahaya et al., 2015). The flood was known as '*Bah Kuning*' or 'Yellow

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<sup>46</sup> Islamic prayer:

<sup>47</sup> Obligatory prayers such as Fajr, Zuhur, Asr, Maghrib and Isya' are observed by Muslims throughout the world, where it coincides with the cycle of the sun within that particular locality throughout the day.

Flood' due to the muddy colour of the floodwater that carried laterite soils from the hills.

The water level in the river rose up to 35 metres high - that superseded the floods in 1967 (Wan Ahmad and Abdurahman, 2015), submerging large numbers of buildings including schools, administration offices, hotels, mosques and houses. Access to damaged areas was heavily restricted. Public transportation such as trains could not operate for months due to damaged and bent railway tracks. Numbers of evacuation centres were highly affected thus, forcing them to be displaced to another evacuation centres that were already beyond the maximum designated capacity.

In addition to the adverse weather effects of the Northeast monsoonal climate that bring heavy rainfall (Figure 5.4) (Abdul Wahab, 2015), four factors were asserted to have worsened the catastrophe. The unusual weather condition that led to an extreme and very intensive rainfall had caused an overspill of nearby rivers (Azlee, 2015). It was also due to the expansion of settlements on the plain topography (Yahaya et al., 2015), exploitation of land resources (Abdul Wahab, 2015) and an uncontrolled land management and logging in the upstream areas (Azlee, 2015). Consequently, the latter factors had caused unexpected damages to the settlements on the flood plain area as the floods streams had brought timber waste and scraps downstream.

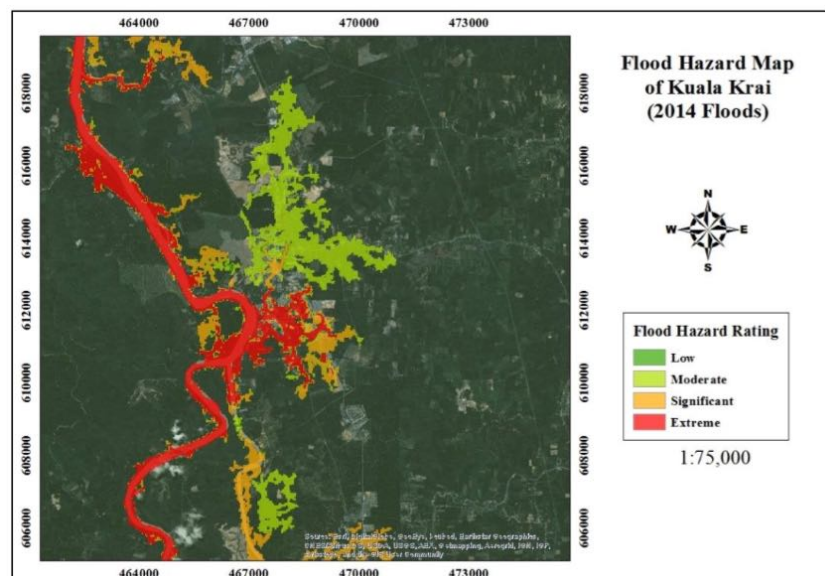


Figure 5.4 Flood hazard map of Kuala Krai in December 2014 (Source: Abdul Rahman et al., 2017)

This tremendous flood situation (Figure 5.5 - 5.7) leading to the destruction of livelihood of local communities has been described in the book 'The Eternal Storm: *Sekali Air Bah, Selamanya Pasir Berubah*'<sup>48</sup> by Chan and Hamzah (2015) as 'almost beyond the capacity of our limited minds to comprehend the massive extent of its terrifying impact'. They continue, 'Entire villages have been wiped out overnight. Rescued villagers tearfully reported being trapped on their rooftops cold and starving for days before help came. Evacuees temporarily housed in schools or flood relief centres had wept as they had seen houses and everything they owned float away in a mad slurry of dead animals, clothing, vehicles, electrical items, trees and everything imaginable'.

In other circumstances, the fast-flowing flood stream had caused hundreds of people residing in the low flood plain and neighbouring the river to flee to the nearby hills or higher grounds in order to save their lives and families. They were trapped for several days without food, clean water and electricity before receiving any assistance. This was due to the severity of the floods that prevented and restricted the delivery of aid.

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<sup>48</sup> This book is published specifically for the Kuala Krai flood in 2014. Where the Malaysian poets were called for contribution.

Figure 5.5 Aerial view shows houses and plantation submerged in floodwater in Pengkalan Chepa, near Kota Bahru, Kelantan in 28 December 2014 (Source: AFP, 2014)



Figure 5.6 The overspill water from the Sungai Kelantan (upper part of the image) inundated the town during the flood in December 2014 (Source: Astroawani, 2014)



Figure 5.7 Houses were inundated in the flood in Kelantan (Source: Astroawani, 2014)



#### 5.4 Kuala Krai town aftermath / The aftermath of the flood

<i>Pascabanjir 2014</i>	After the floods of 2014
<i>Dalam lebatnya hujan</i>	With the pouring rain
<i>Hadirnya banjir di negeriku</i>	Came the floods to my home state
<i>Rumah hancur musnah</i>	Houses destroyed, demolished
<i>Dilanda sang banjir yang menggila</i>	Inundated by the raging floods
<i>Pascabanjir harta rosak binasa</i>	Flood aftermath causes property
<i>Debu merah berterbangan</i>	damaged,
<i>Selut membanjiri rumah</i>	Red dust hangs in the air
<i>Namun rakyat marhaen negeriku</i>	Sludge engulfs the houses
<i>Tetap tabah menghadapi musibah</i>	But the ordinary folk of my home
<i>Kerana bagi mereka</i>	state
<i>Ini hanya secebis ujian dari Tuhan</i>	remain steadfast throughout this
<i>Untuk menguji hamba-Nya</i>	disaster
<i>Kematian usah ditangisi</i>	Because for them
<i>Mereka sudah syahid menghadap Illahi</i>	This is just an iota of God's trials
<i>Hidup mesti terus</i>	To test His servants
<i>Walau gelombang derita</i>	Death need not to be mourned
<i>Pasti menusuk jantung hati</i>	The dead are witnesses before God
<i>Setiap anak Kelantan.</i>	Life must go on
	Even if waves of suffering
<i>Original poem in Bahasa Malaysia by</i>	must pierce the very hearts
<i>Marzihan Mohd Ali (2015)</i>	of all Kelantanese.

This poem written by Mohd Ali M. (2015) describes the situation after the flood struck in December 2014 and how the Kelantanese remain steadfast and faithful in facing the disaster. Their faithfulness has in turn encouraged them to develop resiliency and cope with future challenges in their life <sup>49</sup>. This poem was part of a collection of poetry by five Malaysian poets in a book titled 'The Eternal Flood: *Sekali Air Bah, Selamanya Pasir Berubah*'<sup>50</sup> (2015). The book documented the scenes of the flood aftermath and expressed sympathy to the flood victims

<sup>49</sup> It is mentioned in the Quran about Allah's (Muslim God) warning of human actions and their consequences. Muslims believe that they will get better 'rewards' in return for their faithfulness and patience in facing the 'test'. (1) "Corruption has appeared throughout the land and sea by [reason of] what the hands of people have earned so He may let them taste part of [the consequence of] what they have done that perhaps they will return [to righteousness]." - [Ar-Rum 30:41], (2) "And cause not corruption upon the earth after its reformation. And invoke Him in fear and aspiration. Indeed, the mercy of Allah is near to the doers of good."- [Al-A'raf 7:56]

<sup>50</sup> 'Sekali air bah, selamanya pasir berubah' (translated literally as - once flooding, the sand changed forever) is a Malay proverb.

especially the Kelantanese in describing the situations and consequences of the deluge (Figure 5.8). Interestingly, there is a common strand in this collection of poems. The poets hold the belief that the tragedy was a warning or test sent to his people from God the Almighty, as a result of human actions and alterations towards nature.

There are four aspects of social impacts that emerged in the analysis of the post-flood situation by Tehrani (2015). These are 'psychosocial, socio-demographic, socio-economic and socio-political'. The flood resulted in numerous challenges for communities, organisations, businesses, households and individual residents at the local level. Many people were unprepared for the severe impact to their homes and assets. This situation resulted in distress, anxiety, depression and post-traumatic stress disorder (Wan Ahmad and Abdurahman, 2015). In particular, the flood has resulted in both tangible and intangible losses that are crucially important to consider when helping to rebuild the affected community after the flood.

The Kelantan state economic losses from the flood were estimated to reach RM560 million. In terms of socio-demographic, Karim et al (2016) and Wan Ahmad and Abdurahman (2015) highlighted that people who lived along the river experienced the hardship of losing their homes, food, clean drinking water and transport for immediate displacement. Those who were farming also had to endure difficulty as most had lost their crops and animals during the flood (Karim et al., 2016).

Figure 5.8 View after the flood disaster. Houses were damaged severely, and covered with thick mud (Source: Mercy, 2016)



Meanwhile, the major flood that happened had forced the government to review the function of MKN Directive 20<sup>51</sup> by improving the mechanism in order to be better prepared to face similar disaster issues in the future, especially at federal level. The Malaysian government immediately set up the National Disaster Management Agency (NADMA) to efficiently coordinate with the government agencies in tackling disasters.

During the flood, three different levels of government divisions (districts, state and federal) were responsible in handling the emergency responses and reliefs. Unfortunately, their actions were failing due to the unforeseen scale of the extreme flood situation. This was further worsened by the interrupted electricity supply and lack of communication between the people and the actors (Abdul Rahman et al., 2016). In addition to the disruption that occurred, Abdul Rahman et al. (2016) highlighted issues in reaching the evacuation centres as well as transporting the evacuees due to fast-moving flood waters and the lack of suitable landing areas for helicopters. This further complicated the process of flood aid distribution and evacuation.

Although it is reported that the affected people received assistance from the government agencies, NGOs and individuals, a number of issues occurred throughout the post-flood recovery and response. Among these were the lack of coordination and communication resulting in people affected by the disaster to take their own recovery actions, while waiting for the relief to arrive, as Wan Ahmad and Abdurahman (2015, p. 341) emphasized that the affected people have to 'walk[ing] their own way and develop[ing] their own means to distribute money and others'. Consequently, this resulted in the uneven distribution of aid and essential goods among the flood-affected community (Abdul Rahman et al., 2016; Karim et al., 2016; Wan Ahmad and Abdurahman, 2015).

Due to the physical losses and destruction of homes (Figure 5.8 – Figure 5.21), most of the people were given temporary makeshift accommodation while waiting for further assistance. This occurred both during the process of reconstructing permanent houses on their existing house plot, and in certain cases, during the process of relocating them to new permanent houses to other places. Nevertheless, the extensive damages from the flood had forced them to remain in transit for a long

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<sup>51</sup> Refer to section 2.3.2



period of time. In the study about users perception on temporary relief shelters conducted by Abd Rahim et al (2016) there are four aspects of temporary shelter identified that concerned the users. These are especially related to thermal, visual comfort, privacy and safety. The design and materials used were unsuitable to the local climate, hence resulted in the tents being 'too hot to stay in during the day' (Abdul Rahim et al., 2016, p. 341).<sup>52</sup> Privacy and safety also become their main concerns, since most of the shelters provided were reported to have less consideration about privacy of women and safety.

Among all the makeshift shelters built for the affected people in Kuala Krai, Abd Rahim et al (2016) pointed out that *Perkampungan Mercy Tualang* (PMT) by Mercy Malaysia was 'the ideal temporary house (Abdul Rahim et al., 2016, p. 341). This is due to its well-equipped basic facilities and necessities (Abdul Rahim et al., 2016). Though it seems desirable to stay in PMT during transit time, the kitchen area located outside its individual shelter was marked as a weakness that needs to be improved. Accordingly, the design and issues related to the PMT were further analysed in this research through fieldwork discussed in section 5.5.1 (c) and section 5.6.1.

While topics on post disaster recovery and response particularly on the emergency coordination and temporary relief shelter were widely discussed among architects and charitable bodies, the flood-affected community had different opinions. Many were critical of the provision of post-flood permanent houses and its rebuilding works as the process had taken longer than expected, forcing them to stay longer in temporary tents and transit houses while the permanent houses were built (Rahim et al., 2016). They also argued that the new houses were constructed not according to building standards and quality. This is understandable, as these houses were constructed at great speed due to the pressures to accommodate the affected communities as well as aiming to construct liveable houses within budget and time constraints.

Typically, the post-flood permanent housing is put up after the flood by governmental and/or private institutions. Similarly, following the disaster, the Malaysian Cabinet had agreed to build permanent houses on their own land worth. RM48,000 is used to construct a house for residents whose property was destroyed while an aid of a maximum RM10,000 for

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<sup>52</sup> Interestingly, the providers of these tents claimed that the tents were designed for extreme climates, however on ground, as reported by residents, to be otherwise.

residents whose houses only sustained partial damages (Roosli et al., 2016; Roosli and Collins, 2016). Those who had previously lived in squatter homes affected by the flood, or those who identified that their location of the land was highly vulnerable to flood would be relocated and would be provided with permanent houses in a new settlement from the state government.

However, there are issues of ownership that need to be resolved before the houses can be granted to flood affected people in Kelantan. Similar to the case in Kota Tinggi, the four circumstances of land status issues mentioned in section 4.3.3<sup>53</sup> occurred in Kelantan too. This is mainly due to the absence of standard operation procedures at national level. As a result, the task of providing houses for new owners has several drawbacks. Prior to this, Kelantan had established their particular standard procedure of eligibility in housing provision. This is referred to in Section 5.5.1(a). Additionally, the state government is also responsible to search for land that is suitable to develop the new settlement for the relocation programme.

It was also observed that the authorities had encountered a number of difficulties in providing these new houses. To date, Roosli et al (2016) highlighted that there are no comprehensive guidelines made for building new housing after a disaster, especially in disaster-prone areas. The study on the existing standard operations procedure established in Malaysia will be discussed in subsequent sections.

I am of the opinion that in order to resolve the relocation issues, either in providing guidelines in ownership or designing blueprints it is important to consider the aspect of community not only relying on the government's agency policies. The actions and anticipation of flood-affected communities provides exemplary cases in understanding the reality on the ground impacting decision-making in these areas. Having said this, to explore the conception of post-flood recovery and response is to examine the different phases of post-flood disasters. In this study, the author explores the context of temporary homes of Kelantan as well as the permanent settlement in Kota Tinggi as an indication to what and how architects and agencies should react.

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<sup>53</sup> The land status issues: 1) Houses built on the government's road and river reserved land, 2) Houses built on the government's road and river reserved land and rented to others, 3) Houses built on their own private land, 4) Private land rented. The renters built their own house.

Figure 5.9 View of one of the kampung in Kuala Krai after flood scenario. Most of the houses were totally destroyed  
(Source: M Zakaria, February 2015)



Figure 5.10 One of the houses destroyed in Kuala Krai (Source: M Zakaria, February)



Figure 5.11 The flood survivors were displaced immediately to safer place such as school hall or community hall  
(Source: Bernama, 2014)





Figure 5.12 A house (on the left) was washed away by the flood and stuck on top of another house (Source: bharian, 2014)



Figure 5.13 After flood disaster clearing and cleaning process (Source: Bharian, 2014)



Figure 5.14 An overview of after flood disaster in one of the kampung in Kuala Krai. Roads and houses were severely covered with thick mud. (Source: bharian, 2014)

Figure 5.15 Flood rose up to 3 metres height and affected the shoplots and houses at Kuala Krai town.  
(Source: mstar, 2014)



Figure 5.16 Scene after a few days of flood receded (Source: Ummuawisyi, 2014).



Figure 5.17 A lady sitting at the front of her shop. Items were damaged due to muddy flood water.  
(Source: fotowarung, 2014)



Figure 5.18 The excavator used to remove thick mud on the road (Source: bharian, 2015)





Figure 5.19 Man covered with mud while cleaning his house. (Source: mstar, 2014)



Figure 5.20 The house washed away during flooding (Source: Ibnuhasyim, 2015)



Figure 5.21 The couple sitting on the steps of their house, which had been damaged totally during the flood (Source: bernama, 2015)

## 5.5 Fieldwork findings

### 5.5.1 Post-flood visit



Figure 5.22 View of buildings in Kuala Krai town approximately 3 months after the flood happened, 4 March 2015 (Nor Izura, 2015)

During the period in which the fieldwork was first conducted in Kuala Krai in March 2015, Kuala Krai town had not fully ‘recovered’ from the flood event. Three months after the flood event, I could see that much of the debris had been cleared away but the physical impact on Kuala Krai town was still visible. The main roads were cleared and accessible, but dusty in the dry weather. Evidence of the flood levels especially on the fabric facades of buildings and road signage could be seen covered with muddy yellow watermarks. Shops, which had been operating for decades remained closed, as a result of massive losses. Some people were busy cleaning their properties before they could re-open their shops. Some of the shops had clearance sales to clear their stocks. Soon and Indramalar also described this distressing situation in The Star Online newspaper dated 27<sup>th</sup> March 2015:

*‘...Even after three months of furious cleaning has not scrubbed away the mud. Kuala Krai is stained yellow, with watermarks on buildings and mud residue on treetops clearly marking how high the flood rose’*

My first experience upon arrival in Kuala Krai town was to check into a 3-storey local hotel with a muddy smell and dusty hotel room due to the flood. I could see a devastated scene through the hotel window: most of the buildings, roads, trees and landscapes had turned a brownish-red muddy colour. I found myself puzzled by the impact of the flood and

wondered how it had felt when the flood occurred. The hotel manager nonchalantly told me that most hotels within this town area were closed and there were very limited hotels operating. However, the hotels were full of volunteers working within the district and also local residents seeking shelter from the deluge.

My observations continued to the *kampung* area along the Kelantan River near the town centre. According to Ahmad Asymuni, the Kuala Krai District Officer, this settlement had existed since more than 100 years ago. There were a number of emergency tents assembled along the road and within the *kampung* area. Crooked and damaged houses with watermarks had become the main background throughout the journey. The flood had left houses roofless and with their structures exposed and damaged. There were piles of timber everywhere due to the destruction of houses during the flood. This made it difficult to identify where the houses had originally been located.

The *kampung* houses are usually designed in two parts. The '*Rumah Ibu*' or 'Main House' is the main entrance of the house, the verandah, living area and bedrooms are located and built proportionately on stilts or elevated. This part is mainly built using timber. The elevated design is meant for various functions including safety from weather or flood and wild animals. Apart from that, it is designed to respond to the local climate that is hot and humid by allowing better ventilation flows from under the house. A space underneath the main house is also used as multi-purpose area. The *kampung* house uses a modular system where each of its timber walls and structures can be replaced individually if damaged. The second part is where the kitchen, dining area, and bathroom are located on the ground level. This space is usually built using bricks up to 1.2metres high and the remaining walls are built using timber.

In the past, dwellers residing in the flood plains or low-lying areas in Kelantan were 'generally accustomed to recurrent floods and have traditionally adapted to phenomena through appropriate dwelling architecture and practice' (Yahaya et al., 2015). As development rate increased, settlements stretched in the floodplains. During the normal recurrent flood, the dwellers would usually stay at *Rumah Ibu* until the floodwaters receded. But when the devastating flood struck the town and settlements areas in December 2014, it carried away the *kampung* houses. Some houses were stacked on top of others or dragged into the middle of the road or riverside. The house elements left were only the foundation of *Rumah Ibu* and the brick walls of the kitchen area.

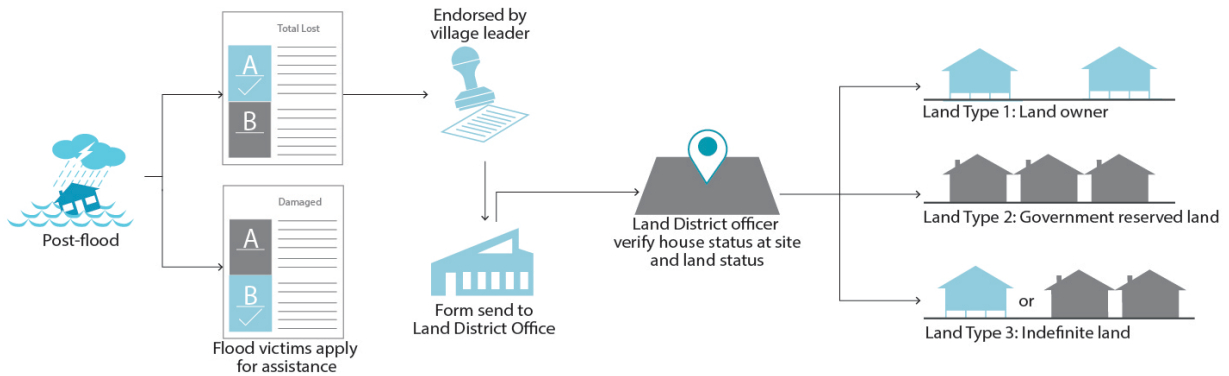


Furthermore, the change of building materials and methods had an effect on changing flood adaptation practices over time. Recent developments had discontinued the traditional practice of having houses on stilts or elevated, which had made them more adaptable to flooding. This cessation was addressed by Yahaya et al (2015) as one of the factors that contributed to the severe impacts of the flood among the current community.

The representation of information in the Kuala Krai workshop, which I attended during the March 2015 fieldwork (refer to section 4.6) is important for this fieldwork as it helps to establish the foundation of understanding the post-flood scenario within Kuala Krai. It presents this complex scene from the perspectives of various professionals, which intertwine with one another. The issues raised are summarised in the subsequent sections with additional emphasis on the sub-topic of government re-housing actions, The Makeshift Shelter or Tent, and the Transit Homes or Temporary Shelter programme.

#### 5.5.1.1 Government re-housing actions

As a result of the flood disaster and the impact it causes, the Federal government had pledged a certain amount of costs per household for rebuilding and repairing works. However, the process of 'disbursement is restricted' by strict rules and regulations (Soon and Indramalar, 2015). Interestingly, in my email correspondence with one of the Committee members of the Malaysian Islamic Party on the 8<sup>th</sup> August 2016, Che Ibrahim highlighted that there was no specific guideline and procedure prepared by the Malaysian government on the rebuilding process in the flood aftermath. In the flood situation in Kelantan, Muhammad (2015) elaborates in his article, '*Mana rumah kami? Memahami proses pembinaan* (Where is our house? Understanding the construction process)', that the Kelantan state government had established a five-steps standard procedure of eligibility of permanent housing construction process for flood victims. This standard procedure is illustrated in Figure 5.23.



After the flood receded, victims had to fill in a form to declare the conditions of their properties. There were two types of forms; (1) Form A for destroyed or total lost house and (2) Form B for a damaged house. The form was submitted to the *Ketua Kampung* (*Kampung Leader*) for endorsement before being sent to the Land and District Office. Once the office received the form, site visits were made to evaluate and validate the information given by the applicants, and to investigate the land status. The decisions were based on three land status categories as per Table 5.1.

Figure 5.23 Process of award and construction of the house after the flood in Kelantan state.

Land status	Actions
Land Ownership Property	<ul style="list-style-type: none"> <li>Permanent houses will be built on their original locations.</li> <li>The constructions are done either by the Federal government, State government or NGOs.</li> <li>The applicants were given an option either to build the house on-stilts (20ft x 30ft) or on the ground (24ft x 34ft).</li> </ul>
Government land (River reserved land, KTMB reserved land, etc)	<ul style="list-style-type: none"> <li>Applicants will be given a cluster housing.</li> <li>The state government is responsible to identify any suitable government land for the project(s).</li> <li>The construction will be done either by the Federal government, State government or NGOs.</li> <li>Successful applicant will be awarded land grant for their new permanent house in this housing development.</li> </ul>
Indefinite land	<ul style="list-style-type: none"> <li>Applicants have to deal with the Land and District Officer to get the official land grant for the land they mentioned.</li> <li>If it is not successful, the applicants will be located in the cluster housing.</li> </ul>

Table 5.1 Three categories of land status applied due to rebuilding permanent houses for the flood victims in Kelantan

However, it is apparent that this bureaucracy has prolonged the recovery process at this pressing period, especially in providing permanent housing for those who had lost their homes. Muhamad (2015) highlighted that the process had to take place in order to avoid future issues, as it was related to the construction and costs for permanent houses and permanent ownership of land and property. At the end of January 2015, the Federal government had launched a rebuilding permanent house program targeting those who owned a land by providing two optional house types, either on-stilts or on-ground (Figure 5.24).



Figure 5.24 Two types of houses launched by the Federal government for those who have lost their houses during the flood disaster in December 2014 (Source: Jabatan Penerangan Malaysia, 2015)

In this permanent house-rebuilding scheme, local contractors were given only 75 days to complete each house. Until June 2016, it is recorded that there were 1,827 applications for new houses out of which, the Federal government was responsible for the construction of 966 houses, the State government was in charge of building 528 houses, 135 houses to be built by NGOs, while the remaining 198 applications were not eligible (Lee, 2016).

#### 5.5.1.2 The Makeshift Shelter or Tent

In spite of all the planned government's post-flood responses and actions, the lengthy process has forced some of the flood victims to stay in temporary shelters or tents. This was also attributed to the fact that they had to move out from schools or halls that were initially used as relief centres during the flood. However, these places were required for repairs and given access for the coming school session. The temporary shelters were funded by various agencies, NGOs, and private donors either company or individual. Large numbers of people were located in school fields in individual tents with communal kitchens and toilets. A larger tent was erected to serve as a communal hall. Some of the people were scattered within their own settlements since there was limited space to

gather a large group of affected people in one place. There were also those who preferred to set up tents within their own compound. Those who had a large number of family members had made use of their remaining house structures and components or from their surrounding areas to form additional private spaces as an extension of their tent. Extra layers of canvas for roofing were added to avoid direct sunlight penetrating the tent and to cool down the temperature in the hot and humid weather during the day (Figure 5.25 & Figure 5.26).

The uncomfortable conditions of temporary shelter meant that there were pressing needs for new homes. Recognising that the tent and makeshift shelters were unsuitable for a long period of time, Mercy Malaysia (Medical Relief Society Malaysia) - the NGO, had begun building transit homes in order to provide better conditions for families, especially those with children, the elderly and disabled (Abu Samah N., 2016). There were large numbers of NGOs and agencies involved throughout the relief period (refer to Table 5.2), however this research focuses only on actions taken by Mercy Malaysia in rebuilding the transit homes.

Mercy Malaysia is a 'non-profit organization that provides medical relief, sustainable health-related development and risk reduction activities for vulnerable communities in both crisis and non-crisis situations' (Abdul Majid, 2015). Founded in 1999, the organization has been involved in a number of domestic and international relief programs including the tsunami in Aceh and earthquake in Nias, Indonesia (Abu Samah, 2016). As part of its humanitarian and recovery activities for flood victims in Kelantan, Mercy Malaysia constructed a 'transit home' called Perkampungan Mercy Tualang (PMT) in Kg Tualang, Kuala Krai as part of the Temporary Shelter Program (Abdul Majid, 2015).

There were a number of issues I wanted to explore in relation to post-disaster reconstruction and rebuilding. The questions include: What is the role of transit home? What are the elements or features that can assist people in becoming more resilient post-disaster and at the same time respond to their priority needs? What can be learnt in this phase? What can be improved in future transit homes or post-disaster - particularly in terms of architecture and housing?

NGOs involved in post-flood relief 2014/2015	
1.	<b>Ikram health (linked to Pertubuhan IKRAM Malaysia)</b>
2.	Pertubuhan Amal Perubatan Ibnu Sina Malaysia (PAPISMA)
3.	Pertubuhan R Kelantan (Royalti)
4.	Ibantu
5.	Organization of Graduates of Educational Institutions Malaysian (HALUAN)
6.	<b>Malaysian Medical Relief Society (Mercy)</b>
7.	Persatuan Ummah Sejahtera Malaysia (PasMa)
8.	Dewan Perniagaan Malayu Malaysia (DPMM) Kelantan
9.	Kelab Doktor Pakar Kelantan
10.	Kelab Ekspedisi Kelantan
11.	Gabungan Bantuan Banjir NGO Kelantan (BBNGO)
12.	USM BJIM
13.	Imam Response and Relief Team (IMARET)
14.	Malaysian Chinese Muslim Association (MACMA)
15.	Institusi Jurutera Malaysia Kelantan
16.	Yayasan Orang Kurang Upaya Kelantan (YOKUK)
17.	Muslim Care Malaysia Society
18.	World Vision Malaysia
19.	Crisis Relief Services and Training (CREST)
20.	International Federation of Red Cross & Red Crescent Societies (IFRC)
21.	Malaysian Red Crescent Society (MRCS)
22.	St John's Ambulance Society
23.	Pertubuhan Muafakat Sejahtera Masyarakat Malaysia (MUFAKAT)
24.	Angkatan Belia Islam Malaysia (ABIM)
25.	Persatuan Isteri-isteri Polis IPK Kelantan (PERKEP)
26.	LION CLUB Kota Bahru
27.	Yayasan Darul Hijrah (DARUL HIJRAH)
28.	Task Force Kuala Krai
30.	Islamic Aid Malaysia (IAM)
31.	Islamic Relief Malaysia
32.	Persatuan Kebajikan Prihatin Bangi (BANGI CARE)
33.	Pertubuhan Kembara Amal (PEKA)
34.	Bridget Bakti Malaysia (BBM)
35.	Khazanah Yayasan (Linked to Khazanah Nasional)
36.	MyCARE
37.	iM4U
38.	Epic Homes
39.	The 3 <sup>rd</sup> Force
40.	Gabungan Impian Kelantan (GAMITAN)

Table 5.2 List of NGOs involved in the flood relief during and after the flood disaster in December 2014



Figure 5.25 & 5.26  
Temporary shelters  
donated by  
ShelterBOX for flood  
victims in Kuala Krai.  
Victims have stayed  
in the tent for more  
than a month. A  
layer of canvas on  
top of the tent  
functions as a  
double-layered roof  
due to the hot and  
humid weather  
especially during the  
day. (Nor Izura  
T.,2015)

## a) Transit Homes or Temporary Shelter program

I visited Perkampungan Mercy Tualang (PMT) in March 2015 (Figure 5.27). It is located 5km away or about 10 minutes drive away from Kuala Krai town centre, which had just been completed. PMT is a cluster of transit homes initiated by Mercy Malaysia for 33 selected families that were severely affected during the flood. PMT was built on private land with a conditional agreement of two years maximum 'length of stay' before the PMT dwellers would need to move to their new permanent houses (Abu Samah, 2016).

The elevated transit home design is based on a typical Malay *kampung* house (Figure 5.28). Basic spaces such as the verandah, a living area, a bedroom and an outdoor kitchen at the back of the house were provided. It uses timber as the structure and plywood as the main material for the walls. These are common materials that are easy to find locally and enable swift construction at an affordable price. The transit homes were built by local builders and carpenters as part of the programme initiated to help them rebuild their lives and community. The construction for each unit took 5 to 6 days to complete (Hafiz Amirrol, 2015, Abd Majid, 2015) and was coordinated and supervised by volunteers. The PMT is completed with basic facilities such as shared praying area or *surau*, multi-purpose area and common toilets with a washing machine (Figure 5.29).

Figure 5.27  
Perkampungan  
Mercy Tualang:  
Proposed  
Masterplan (Mercy  
Malaysia, 2015)





Figure 5.28 Transit house initiated by Mercy Malaysia for 30 families. This development includes common toilets, common kitchen and a multi-purpose space (Nor Izura T., 2015).



Figure 5.29: In progress: A multi-purpose space for the people to utilise as a prayer area, for discussions and meetings (Nor Izura T., 2015)

### 5.5.2 Kuala Krai Post-Flood Disaster Re-visited

I revisited Kuala Krai town in December 2015. During my travel preparations to Kuala Krai, I was reminded by friends and family to be aware of any signs of flooding as it was still within the monsoon season.

*“If it’s raining heavily more than 24 hours, it is good to travel out from the place as soon as possible. There is a high possibility of flooding. You don’t want yourself to get stuck in that situation..” – Izawati T., 2015*



I was thrilled to visit Kuala Krai again after my earlier visit in March 2015. It was exactly a year after the major flood had struck. The town had gone through a lot of improvements since my first visit, though the flood effects were still visible here and there. Repairs, especially on the town's infrastructure were still in progress. Throughout the journey, I observed that there were many new individual permanent houses built within the settlements that stood out from their post-flood surroundings. Due to a change in political state government, these new houses were painted in two colours that differentiated the various source of subsidies they received - blue coloured houses showed that the Federal government had funded them and yellow coloured houses were funded by the state government. There were also new permanent houses built by the NGOs, however the numbers were very small.

This fieldwork trip was significantly important for many of the issues that I wanted to address in relation to the people's ability to recover from the flood event, their everyday concerns and practices and their imagination or expectations from their new relocation spaces. In order to understand the implications and effects of the flood and the flood-responses on the ground, I had engaged with a number of local people from the PMT community. The question of resiliency was addressed in the open-ended interviews as personal narratives and stories. They are supported by my 5-day on-site observations and experiences of the living condition of PMT community. The length of stay during this field trip was short as I was concerned about the possibility of a recurrent flood during the rainy and monsoon season. Nonetheless, the respondents were in contact even after my departure from site.

Most of the male respondents were unavailable due to work; hence the interviews were conducted with five female respondents. This was reasonable as the female respondents were mostly housewives whose life was attached to and revolved around the activities within the PMT. The interviewees were asked to reflect on their experiences during the flood and their insights on living temporarily in the PMT. It was important to understand the flood event from their perspective; to ascertain their needs and priorities throughout the recovery time, as well as their expectations of a new temporary settlement.

### 5.5.3 The flood experience

A female resident from Kampung Jalan Geale, Respondent KD, described this unforgettable experience during the interview in January 2016. She recounted how she had saved her own life and that of her family. She also gave a depiction of the atmosphere on that particular day, the 24<sup>th</sup> December 2014, when about 125 people including babies, fled to a nearby house located on a higher ground when the water level started to rise. They were stuck for three days without electricity, clean water and sufficient food supplies, without rescue or assistance from government or disaster agencies:

*“The first flooding on the 17<sup>th</sup> December did not [occurred] here (Kuala Krai) but in Mukim Mengkebang (Sub-district Mengkebang) - including Kuala Kertam and Bukit Sireh. It did not happen in Kuala Krai. We thought that maybe there would be no flood that year because Mukim Mengkebang had been affected badly with drifted houses, divided houses, lost baby. [...] Then, after 5 -7 days later, the rain started pouring here on the 23<sup>rd</sup> December. At that time, I was at the market, selling food with my aunty. And I told my aunty, “People from Gua Musang informed me that it is raining heavily there. We need to be prepared to move out.” But my aunty said, “I think, it’s not possible”. Then, we continue our work and we bought some fish and other groceries as an emergency for the next day. But, it didn’t happen. When I returned home, the water started to rise...I expected there will be flooding tomorrow. So, my family and I didn’t sleep that night. We were in standby mode and monitored the water level. The next morning on the 24<sup>th</sup> December, it was still acceptable. But, the road you (The author) used to come here just now was already inaccessible. The flood rose up to the level of my thighs. Afterwards, I went to the town, which at that time it was still safe. However, on night of the 24<sup>th</sup> December, during Maghrib<sup>54</sup>, we moved out from the house and*

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<sup>54</sup> Muslims perform prayers (*salah*) five times daily. Prayer times are standard for Muslim in the world, which it is determined by the position/orientation of the sun in the sky. Hence, *salah* times vary at different location on the Earth. Malaysia is located in the tropic where the sun orientation, and therefore the *salah* times are consistent throughout the year. For that reason, *salah* times often used as time-based references within the Muslim community especially in their daily conversations. This is important in this research as the interviewees mostly used the terms in their narratives. The five times *salah* are: (1) *Fajr* - dawn or before sunset, (2) *Zuhur* - midday, after the sun passes its highest, (3) *Asar* - the late part of the afternoon, (4) *Maghrib* - just after sunset, (5) *Isyak* - between sunset and midnight

*stayed (in the car) at the main road. After Isyak, the water rose and overflow up to the bridge level. Usually, the water never rose up that high. We decided that it was time for us to move out. We were surprised, because the situation had never happened before. So, my husband and I brought along my mother-in-law into the car to get out from that place. Unfortunately, the roads were closed and covered with water overspilled from the riverbanks. So, instead we went up to the nearest hill and seek shelter from the only two-storey bungalow house there. We arrived at about 9pm, the night of 24<sup>th</sup> December where there weren't many people there. However, by 3am in the morning, the house was crowded with people trying to save their life and the only place that was safe at that time was the bungalow.*

She described further the situation during the flooding:

*"It (the hilltop) was like an island. There was no other place to go. At 3am in the morning, everybody was wet due to heavy rain. I can see some of them pushing their motorcycles and boats to safer places. [...] The rain did not stop. When I woke up the next day, all the houses were gone - all submerged under the flood. I asked myself, "Is this for real?" You can only see the upper half part of the lamppost on the bridge. At that time, I felt like I was dreaming. We had no food and clothes [...] I did took the quilt and pillows before but my husband said, "We don't have to bring these, usually flood will recede in 2 days", but the situation like this never happened before. So, I put them back on the bed [...] but now, everything is gone."*

With regards to the emergency response received during the flood, Respondent KD points out the following:

*"The helicopter was not able to land, so they threw food in the water near us. [Unfortunately] some of the food had damaged and were drifted by the water. I could see children run and scramble for the food".* She described that the situation after the flood was comparable to the tsunami in Aceh, Indonesia and said, *"This was what they had gone through [...] and now we are experiencing it. [...] On the 30<sup>th</sup> (6 days after), my house remains inaccessible. I said to myself that, "I'm going back home and will clean up my house since the flood has receded." But, when I*

*reached there, I spontaneously said, "Oh Allah<sup>55</sup>, where is my house?" The house was there when the water rose but then drifted along with the flood. However, when the flood started to recede, the house did not land on the site but on the road. All the houses near the area collided with each other - back to back. There was no way to reach there. It was full of mud, the smell was really bad where woods, timber, and rubber trees were everywhere."*

In an interview conducted with another respondent, in January 2016, KI shared her flood experience. According to KI, the Kampung Hujung Tanjung, a *kampung* located at the tip of the 'muara'<sup>56</sup>, and which is home to 5 families was completely destroyed. Although all of the houses were washed away into the river, they were grateful that everyone was safe.

Another flood experience was shared by a 70-year-old lady who had lived in Kampung Jalan Gil for over 50 years since her marriage, and had lost her house which was located near the valley. This unprecedented flood was her third experience dealing with large-scale flood events since living there:

*"There was no warning or hint observed. My guideline was the water level from the main river. If the water flows in, then there will be flood. Normally, if this occurs, it will quickly flow out. But at the time, it didn't. The water kept on streaming in and flooding the valley. When I was about to perform the Isyak prayer, the water rose up to my calf. I haven't finished my prayer that the water rose higher up to my house level. Then, I waded through the water. It was at this high (showing her thigh). At that time, I didn't have any knee problem. So I forced myself wading through the water. [...] I moved out and stayed at my neighbour's house. It is a 2-storey house. But the next day the house was submerged up to ground floor ceiling level. My neighbour and I had to find someone to rescue us by boat. We moved out to the house on the hill. There were 125 people stranded there to save their lives while waiting for the flood to recede. We stayed there for 3 days. [...] During the flood first few days, we relied on food that was floating across the house. Some of the men swam and 'caught' it for us,*

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<sup>55</sup> Allah refers to Muslim God.

<sup>56</sup> Muara = estuary

*especially for the kids that were starving. [...] There was no electricity and clean water supply for 2 weeks. We had to use candles during the night, and we took our bath using floodwater and rainwater. [...] After the flood retreated, I moved to a JKR (Public Work Department) house near the town. It was not an emergency flood relief centre. I didn't go to the relief centre because it was far. There was a mosque dedicated for emergency flood relief but due to the scale of the flood, they had to move to a nearby school at the hill. It was not easy for me to move there hence, I decided to stay at the JKR house. It was safe and empty. I stayed there for a week. When the road was accessible, I stayed with my child at Sungai Durian. That was before they allocated the ShelterBOX. I think I stayed in the tent for a month or two. There were a lot. You could see all white [shelters] [...] scattered throughout the village. They distributed food and clean water there. [...] We utilized any water source even from the nearest affected houses within reach for bathing and cleaning."*

Similar to the flood incident in Kota Tinggi, the National Security Council and Welfare Department were responsible to make sure that people received sufficient basic help and needs. After the flood receded, large numbers of international and regional NGOs came to help. Private companies and individuals also offered to help. However, there was a problem with a lack of coordination especially during the immediate response phase. Food was distributed unevenly; some places that were located farther from the town and rural areas with difficult access were reported to have received slow relief and less food supply.

During the flood disaster, it was observed that all respondents had deployed traditional skills and resourcefulness by using their instinct and senses, before finally deciding to move out of their houses. In addition, none of the respondents had mentioned anything about their reliance on warnings from the media, either online or offline. Instead, they relied on previous experiences or flood 'benchmarks' established by different individuals.

### 5.5.4 Perkampungan Mercy Tualang (PMT) Revisited

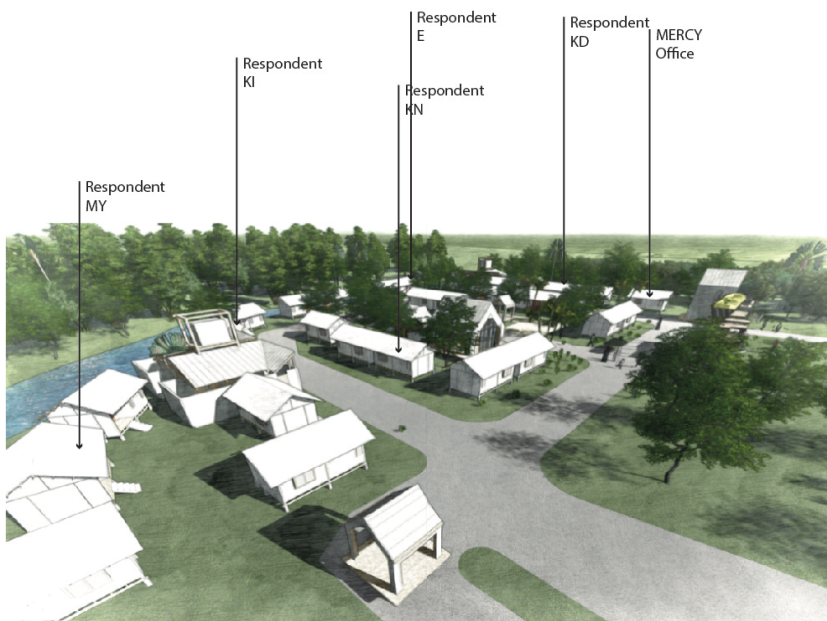


Figure 5.30 Visual illustration of Perkampungan Mercy Tualang (PMT) and location of respondents within the PMT. (Source: MERCY, 2015)

I revisited the PMT in December 2015, 9 months after it was launched by Mercy Malaysia and occupied in March 2015. The visit also marked one-year after the flood disaster had struck. The PMT seemed to have gone through a substantial transformation since the occupants moved in. The PMT was provided to 33 families originally from three *kampung* nearby; Kampung Jalan Gil, Kampung Landak and Kampung Hujung Tanjung (refer to Figure 5.30 & Table 5.3). The PMT had come to life, as there was an abundance of colours and activities. The PMT community has continued with their lives and returned to a daily routine as most had started to work and moved on. For most of the dwellers, self-employed jobs have been the main source of income. The men were mostly at work during the day and only returned in the evening. Meanwhile, the women tended to their children and took care of their houses.

Kampung	Number of families
<b>Kampung Jalan Gil</b>	12
<b>Kampung Landak</b>	3
<b>Kampung Hujung Tanjung</b>	15
<b>Others</b>	3

Table 5.3 Numbers of residents in PMT based on their original kampung. The highest is from Kampung Hujung Tanjung, and followed by Kampung Jalan Gil, Kampung Landak and others.

#### a) Common ground and boundaries

Common space such as the *surau* or public praying space is provided within the PMT area for the community to use collectively.

Located centrally within the development, the *surau* generally functions as a main component that becomes a focus for other spaces within the PMT's boundary. Megat Mohd Nor, MZ (2015) in his speech during the handover of the *surau* expressed that, '*...the construction of newly established surau in PMT is to allow the community to carry out their religious prayers and ceremonies...'*. Nonetheless, throughout my visits and observations in PMT, the *surau* has become a gathering place for adults and youngsters, a place of learning and discussions such as the weekly religious classes. This demonstrates that the *surau* is not only limited to its initial function as highlighted in Megat's speech but utilized to its full potential. Apart from being a place of communal worship for Muslim men and women, the *surau* has become the heart of the PMT and its community. Hence, it fulfills its primary function of social inclusion.

Similar to the informal house arrangements in the *kampung*, the semi-detached houses in the PMT were built within a compact space that is near to each other, providing them sufficient space for privacy but still within the distance that enable neighbourhood surveillance. The fenceless compound in the PMT serves as an intermediate space that draws the line between the privacy of a house and the public domain of a *kampung*. The function of this space is changeable according to needs. For the kids in PMT, this open common ground provides them an ideal playground to play within easy observation by the parents and neighbours. The open spaces also serve as a place for events, celebrations and gatherings (Figure 5.31).

#### b) Spatial adjustment

An elevated platform that resembles the front porch of a typical Malay *kampung* house has become a special feature of the PMT house that dwellers use as a place to relax and socialize in, thus making them feel the normalcy of living as it is reminiscent of the laid-back and friendly environment of a typical *kampung*. Despite this being a transit village, the dwellers have started to give a personal touch to their house that fulfills their needs and represents their identities. Space modification can be seen particularly with the open kitchen located at the back of the house, which is mostly covered with layers of canvas that act as shelter from rain, but without any walls that separate the kitchen from others. Railings at the porch were installed on the verandah for safety purposes for babies, toddlers and the elderly. Louvred windows in



Figure 5.31: Views of PMT. This was nine months after the flood victims moved in from their emergency shelter, December 2015 (Nor Izura T., 2015).



the bedrooms were mostly closed and covered with clothes to maintain privacy.

### c) Issues

Although the architectural settings and characteristics of this transit village are generally accepted by the dwellers, there are however, a number of issues related to safety and comfort highlighted during the interviews mainly in three situations:

#### 1) Flood-prone site

PMT was built on a low-lying area prone to flash floods. In response to the site condition, houses were designed and built on stilts and elevated from the ground. Respondent E whose house is located near a small river area (Figure 5.32) explained that Mercy have informed all PMT residents about the flood situation and actions that should be taken if the flood is getting worse during their stay:

*“We had flood here too (PMT). Usually when it’s raining, all of us are already aware of this. (...) and that was the reason Mercy did the flood simulation yesterday. So we know where to go when the flood get worse. Normally, the flood raised up to 1 feet high ”.*

Although the flooding in PMT is relatively small and temporary, she expressed her feelings of being anxious and terrified as it always reminded her of the major flood experience:

*“I am very scared during the [during] the flood. Here (PMT), I am scared too. If it’s raining, the water will overflow and flood the PMT (...) [thus] it always reminds me of the big flood. The house sank up to one foot high. That’s why Mercy took an early action [and awareness], (...) they show us where to run, (...) preferably to the hill besides the PMT before they can move us to an evacuation place.”*



Figure 5.32: Small river located behind Respondent E's house, December 2015 (Nor Izura T., 2015).



Figure 5.33 Watermark shows the level of floodwater raised during flooding, December 2015 (Nor Izura T., 2015).

Respondent KD had described this through her observations and local knowledge about floods, reflected throughout her stay in PMT:

*"It only rain for a short time today, then it disappeared. If it's raining here, you can see the watermark showing under the green mark (at the column of the house)...if it's raining for an hour, the water will raise up to that level."*

She highlighted the site as the lowest area when compared to other areas along the river (Figure 5.33), and the lowest zone in PMT is near to Respondent E's house. Due to it being a particularly vulnerable area, Mercy's temporary office has been moved to another place:

*"This is the first place (for the water) to raise. That (showing the watermark at the column of the house) level within an hour. If the rain stop, it will recede. But if it's raining for the whole day, I think (...) I don't know. That is the reason Mercy removed their office because of there are lots of important documents [...] worried that if its raining heavily, the didn't have enough time to save all of them (the documents). If it's really flooding here, the water will start to rise from that area (Respondent*

*E's house) because there is a small river behind their house. You can have a look at the river there."*

## 2) Elevated house design

Despite the fact that the transit houses in PMT were built on stilts to respond to the site condition, two respondents highlighted that the need to walk up the staircase especially to the kitchen and toilet, does impact their physical condition, especially for the elderly.

This was expressed by respondent MY, *"I had knee problem probably because of the daily activities I did here, that requires me to go up and down the steps, especially to the kitchen area. I am already old, so the 'oil' in my knee has dried up. On top of that, my knee bone has been protruded out a bit, and it hurts (...) My son-in-law built the kitchen and toilet for me at the back of the house. Easier for me to walk further to the common toilet."*

## 3) Common toilets

The common toilets located at the corner of PMT compound raises two main issues according to the respondents. First, the safety of PMT residents especially female residents and children, when they need to use the bathroom or toilet at night. Second, the respondents were having difficulties in using the toilet during rainy days.

## 4) Outdoor kitchen

Respondents reported that they were having difficulties with using the kitchen located at the back of their house especially during the rain. In the early days, they had to use an umbrella while cooking. Nevertheless, this was not an ideal solution as the rainwater splashed into the food as they cooked. In response, they had improvised a temporary canvas hanging from one house to the other as a shelter for the space. This had become useful even during the day to protect the residents from the direct sun.

#### d) Redevelopment program by Mercy

In preparation for the recurrent floods and development of a resilient community, Mercy Malaysia has organized a series of programmes. One of the programmes that had been conducted was the 'Flood Simulation'. The programme imitates the actual flood evacuation process. It was designed to educate PMT residents on how they should evacuate to an assigned safe area, in the event of a recurrent flood during their residency in PMT. It emerged that the awareness among the villagers or the ones who had experience the flood in 2014, had increased to their advantage. This is evident in the ability to use life jackets and awareness of the safety precautions. In one example, respondent KD had prepared a bag full of cloth and important documents in case of emergency while respondent KR had already arranged or planned to relocate her motor bike and car at the house on the top of the hill - the house where they had taken shelter during the 2014 flood.

#### 5.5.5 Site visit

While I was at the PMT conducting the interviews and observations with two respondents, KL and KR, they invited me to view and observe the conditions of the affected areas nearby, especially in the three *kampung* mentioned in Table 1. We went there by motorcycles and it took less than 5 minutes to reach. Motorcycles are one of the main transportations used by the villagers. Throughout the tour in the *kampung*, we rode on small tracks that could only be accessed by motorcycle or bicycle and also small roads wide enough for a single car. There were mostly timber houses built close to each other on the left and right of these road and tracks.

KL and KR brought me to Kampung Hujung Tanjung where KL's house was located before the flood. While we were at the site, KL indicated that there were 5 houses built within the area and none of them could be saved. All the houses were made of timber and bricks but had been swept away during the flood (Figure 5.34 & 5.37). Apparently, at the site there were remaining staircases constructed out of bricks marking the original location of their house entrance. They built their emergency shelter or tent on their site after the flood receded before they moved into PMT in March 2015. However, some of the Kampung Hujung Tanjung residents still kept their belongings, which were still in good condition under the sheds made with the blue striped canvas.

Figure 5.34: The condition of a house in Kampung Hujung Tanjung, near the Lebir River (behind with brownish water) that was destroyed and washed away during the flood. It is now left with ruins of the kitchen area constructed out of bricks. Picture taken on 16th December 2015 from KL's house entrance staircase (Nor Izura T., 2015).

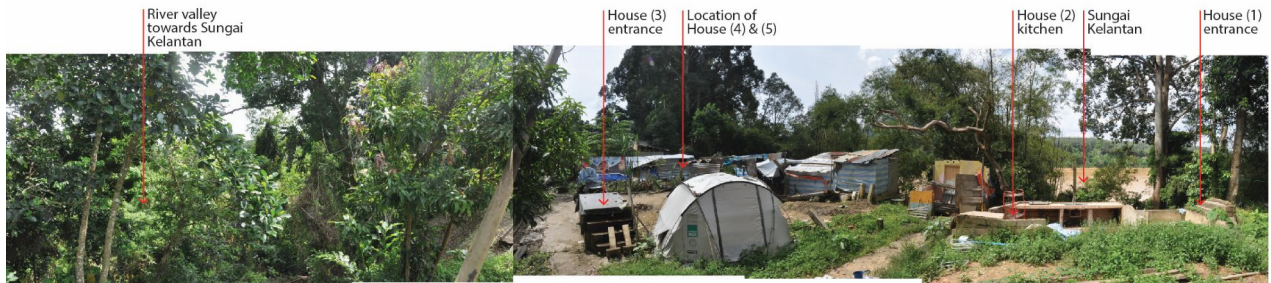


Figure 5.35: Post-flood view at Kampung Hujung Tanjung taken from House (2) entrance staircase. Picture taken on the 16th December 2015 from KL's house entrance staircase (Nor Izura T., 2015).



Figure 5.36: Post-flood view at Kampung Jalan Gaele. Watermarks from the flood can be seen clearly on the wall of the house (left). Taken on 16th December 2015 (Nor Izura T., 2015)



Figure 5.37: Post-flood view at Kampung Jalan Gaele taken from the alleyway. Kampung houses at this area were drifted away during the flood. Their house entrances and structures left at the site, marks the original location of their houses. Wild weeds and shrubs covered the areas. The residents in this area were not allowed to come back and rebuild their houses by the landlord. Therefore, they had to be displaced involuntarily. Taken on 16th December 2016 (Nor Izura T., 2015)

We were then taken to Kampung Jalan Gaele where KD and MY used to lived. It was severely affected during the flood as compared to other *kampung*. Unlike Kampung Hujung Tanjung that consisted of only 5 houses, this *kampung* had a larger number of residents. According to KD, previously there were more than 20 houses in the *kampung*, but, “*all of them were destroyed, except for one house.*” Although the visit was a year after the flood, the damages and impacts were still apparent. Some parts of the *kampung* were inaccessible with tall green weeds covering the areas. During the tour, KR reminded me a few times to be careful and not to walk further towards the wild weeds as there might be dangerous or poisonous animals - usually snakes and centipedes.

Throughout the on-site observation, it can be seen that houses were built on stilts and were close to each other. MY described the previous character of this area (figure 16) as a lovely community place where they experienced good and warm relationships with each other, especially during special occasions or ceremonies:

*“I am deeply attached with it (kampung). My late husband built the house. It is my place, because I had lived there for such a long time. I don’t mind when my neighbour built their house in a very close distance to my house. These people have become part of the ‘family’. We know each other well and we looked after one other. You can feel the joy of Eid Festival because we celebrate it together like families. Household members from each family will come back to the kampung and celebrate together. (...) [Unfortunately] after the flood, the situation is not the same. Most of us cried when we looked at our houses wrecked into each other’s houses. Because our houses were built close to one another.”*

#### 5.5.5.1 Local district actions

Apart from gathering stories about the experiences and private lives of displaced families in the aftermath of flood, it is essential to know what actions had been taken by the various responsible government agencies. On that account, I had interviewed the Kuala Krai District Council Officer, Mr. Ahmad Asymuni in December 2015. The discussion was grounded on the role and actions of the local council district in their responses toward this unprecedented disaster. In the interview, Asymuni explained that the first immediate action taken after the flood receded was managing the waste disposal and cleaning. This was enforced during the first month after the flood. He elaborated further that this operation was necessary to prevent unwanted spreading of diseases commonly found after the deluge, as what was identified by the Health department. They had also focused on rebuilding and making good the existing infrastructures that had been damaged. These are actions that has a collective impact among larger communities rather than focusing on a specific areas or groups of people.

With regards to the permission of rebuilding or relocating flood-affected families in Kuala Krai, the local district council has no authority over the decision. They were not responsible in awarding or locating the communities at a certain given area. Instead, the responsibility lies with the Kuala Krai Land and District Office where the approval processes are explained earlier in section 5.3. Once the Land and District Office has identified the possible areas for relocation, the Kuala Krai District Council will revise the land use zoning area accordingly. Generally, in the event of such disaster, the government will normally find the cheapest land for the relocation programme of new settlements affected by flood. It goes without saying that the land is undoubtedly far and secluded from the main town.

#### 5.5.6 Relocation and new settlement: Kampung Telekung

The Federal government and Kelantan state government were responsible and had worked in unison with the NGOs to develop new settlements for relocated families. Unlike rebuilding individual houses on private lands that took only 75 days to complete, the new settlements took longer to accomplish. There were 6 new settlements developed within Kuala Krai territory (PTJKK, 2017), mainly for the relocation of flood-affected families who had completely lost their house, including the families from PMT.

Location	House unit	Funded by
Simpang Tiga, Manek Urai, Kuala Krai	60	Selangor State
Kampung Telekung, Kuala Krai	252	Kelantan state, NGOs Kelantan and Lembaga Zakat Selangor
Desa Darul Ehsan, Manek Urai	59	Kelantan State
Kampung Staponal, Batu Jong, Kuala Krai	31	Federal
Sungai Durian, Kuala Krai	107	Federal, Yayasan UEM and Yayasan Hasanah
Kampung Manjor, Kuala Krai	30	Federal
Limau Kasturi, Kuala Krai	70	Federal
KESEDAR, Lebir, Kuala Krai	8	Federal

Table 5.4 New settlements developed within Kuala Krai, funded by either the state government or the NGOs.

The biggest new settlement at Kuala Krai town is Kampung Telekung. It is located about 18.8km (Table 5.4) or 20 minutes away from Kampung Tualang where the PMT is located. There are 252 houses constructed in 3 phases, funded by the Kelantan state, NGOs and Lembaga Zakat Selangor. During my fieldwork in December 2015, 60 units of houses in Kampung Telekung were constructed and the expected completion was until February 2016 (Figure 5.38). Although the respondents were aware that they had to be relocated and were not able to return back to their *kampung*, they have expressed their concerns about the uncertainty of the resettlement location. This has in turn affected their arrangements for new jobs and other daily routines. Respondent E who is looking forward to staying in her new permanent house however, highlighted the following:

*“...They [the government] said it would be in Kampung Telekung. It’s quite far. I’m not sure how am I going to work after this. (...) It’s near Machang – however (I am assuming that) not all will stay there. Some might have to stay at Sungai Durian and Batu 33. I am not sure how they divided the names to award the houses. [For my case], they sent me a letter and I just obliged. The house is permanent [and] we will get the ownership of the house, together with the plot land. (...) I had visited the house. It has 3 bedrooms, a landed house. (...) some of them are one-storey terrace houses, some are one-storey single houses. But they didn’t mention which house would we given. (...) When I moved there, I am thinking of selling home cooked mixed rice in the morning at the front of my house. Because it is quite far for me to travel to the shop where I*



*currently work. I have to find my own initiative to generate income. My children might have to change to other school that is nearer. We have to consider our financial conditions.”*

Unlike Respondent E, KD had a different view on the relocation programme. Respondent KD made a comparison on the house quality and space as she had imagined that, *“the future house may be more sturdy because of the material used, but the previous house was bigger (...) although my previous house was old, but I am comfortable living in there”*. Although an added value to her new permanent house, she was not enthusiastic or excited to move out further from her existing *kampung*. She claimed that:

*“It might be difficult for us [KD and family] to adapt with the new place. I think I am more comfortable here (...) because I am used to this place. Furthermore, I am working at the town. If I stay at the new area (Kampung Telekung), it will be difficult for me to go out and travel. (...) The distance from here to the town is about 10 minutes. [From Kampung Telekung], it will take 20 minutes and [furthermore], I have to take risks to cross the highway while riding my motorcycle. So, I am quite anxious.”*



Figure 5.38 Permanent housing development for flood victims under construction in Kampung Telekung, 18<sup>th</sup> December 2015 (Nor Izura T., 2015)

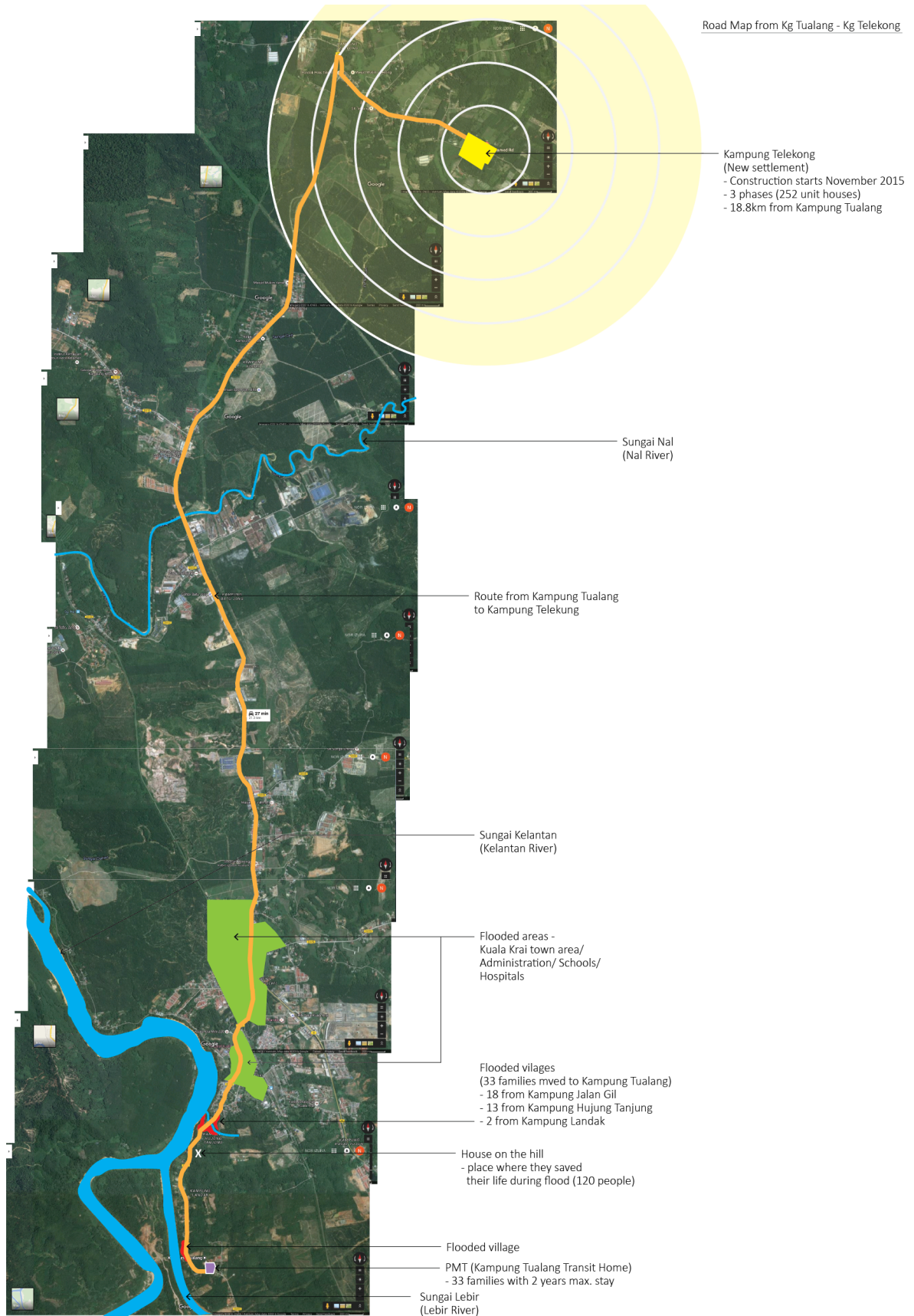


Figure 5.39: Map showing the location of Kuala Krai town (green), Kampung (red), PMT (purple) and the new resettlement housing – Kampung Telekung (yellow). It is clearly showing that the flood victims were relocated away from their original kampung and the Kuala Krai town centre.

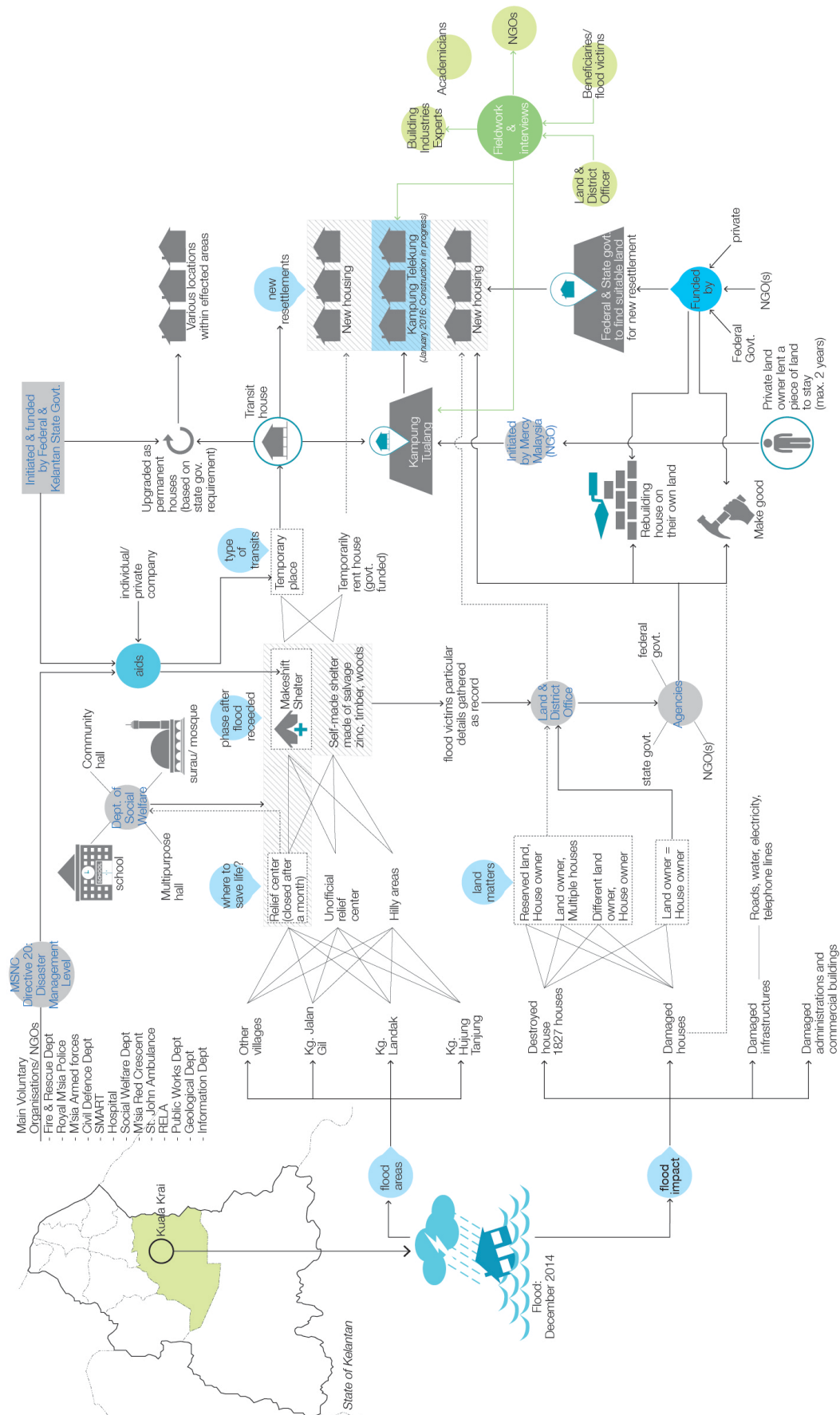


Figure 5.40 Overview of the 2014 post-flood in Kuala Krai, describing the category and relationship of places, events, actions and the agencies involved. Please refer to Appendix 4 for larger scale format.



## 5.6 Discussions

### 5.6.1 Responses after disaster: The recovery period

The raging water during the flood in December 2014 had swept away houses leaving people devastated and without their belongings and properties. A year later, at the time that this research was conducted, it was identified that people were consecutively relocating, recovering and rebuilding (figure 5.42). The recovery process is complex, it requires recognizing the individual accounts of a person's emotional reactions to personal issues such as lost or damaged homes. As a consequence, this leads to a sense of transient homelessness, unstable jobs and inconstant economy. Those who had lost their houses, had to deal with issues of land ownership before subsidies for new permanent houses could be awarded. While those with land ownership were allowed to rebuild their houses immediately, those without were not able to do so. The latter were hopelessly embroiled in the government bureaucratic 'waiting' phase and procedures. The decision of who and where to be located was eventually decided by the government.

Adapting the narrative of 'transit' community in PMT, the fieldwork conducted reveals that the affected families had gone through several displacement and relocation processes before occupying the transit houses. All of this process occurs while waiting for the completion of their new permanent houses, such as in the construction and completion of Kampung Telekung (Figure 5.39 – Figure 5.41). These were families that had completely lost their properties during the flood and were mostly those who had previously built their houses on rented or government land.

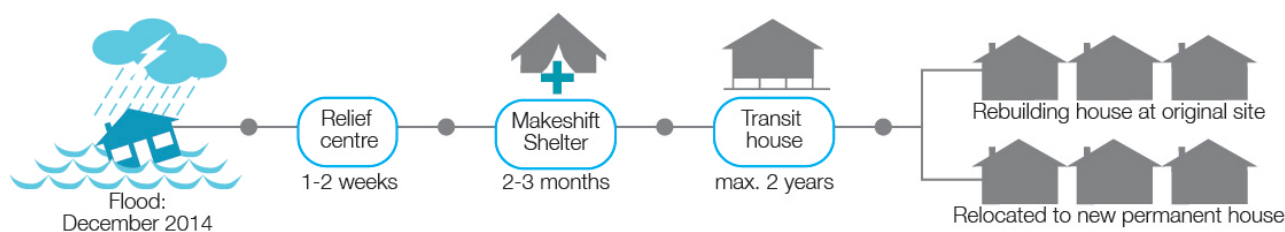


Figure 5.42: Diagram shows affected families went through several relocation places before they moved to their new permanent houses.

As a consequence, the post-flood situation has left them in uncertain circumstances throughout all the different recovery phases. Though it can be observed that the places they resided in throughout the 'transit period' were more favourable as time passed, the respondents had to confront with continuous challenging phases of adjustments and

adaptations. Thus, making them more resilient. In this situation, 'adjustment' does not only pertain to their self-adaptation - emotionally and physically in responding to its new environment - but also, to the efforts in creating a sense of 'normality' within the new community or place. As Coffman (1996, p. 354) writes, 'The effects of natural disaster do not end with the event itself; the disruption of normal environments and social relationships created by a disaster can exert substantial influences on the quality of life of individuals, families and communities.'

The influence of natural disaster especially during the recovery phases could also result in mental or emotional strain among the affected people. The uncertainty of the post-flood disaster situations produces higher stress levels and this leads to other emotional tensions affecting people's relationships and livelihoods. However, it was observed that most of the respondents had realized that nobody can help them rebuild their life, either emotionally or physically apart from themselves. The study surmises that after having experienced a multitude of difficulties during and after the floods, the respondents should be given back their emotional stability by providing them a 'starter-kit-in-living' through architectural responses. In order to kick-start their livelihoods, the concept of transit homes provides a starting point for them to regain their emotional and physical state, collectively, which is more rewarding than living in tents. The transit homes or transit houses presents a notion whereby simple architectural solutions, either intentionally or not, could provide a place where flood-affected communities can re-establish their lifestyle. Moreover, it is argued that transit houses become a testing ground for a different model of architectural quality, a better way of living or simply a preparation for important social and cultural aspects that need to be incorporated into their permanent housing in the future.

### 5.6.2 The Transit House

The transit houses in PMT were initiated by Mercy Malaysia and occupied for approximately 3 months after the flood disaster in December 2014. Provided for 33 families, these houses were built using affordable and readily available materials - plywood and timber structures - that were easy to acquire and locally supplied. Local builders are familiar with these dry construction materials that were fast and easy to assemble. In the case of PMT, the local builders commissioned were originally from the nearby *kampung* or within Kuala Krai. As a consequence, this also supports rebuilding the economy of the local families and community.

Throughout my observations and experiences, I identified that the PMT dwellers have shown respect towards the private and public use of spaces. This is accomplished without clearly imposing the physical boundaries such as fences among the dwellers. The minimal use of visual and physical barriers suggested that the residents have acknowledged the 'invisible boundaries' by confronting to cultural rules and norms. With this in practice, it demonstrates that there is a mutual respect, trust and understanding of collective responsibility of the place - PMT. In contrast to the typical terraced houses in Malaysia that are already segregated, the PMT proves that the barriers among dwellers, either physical or psychological resides upon collective understanding. Again, this resonates with the traditional Malay dwelling of *kampung*.

Despite it being a temporary, inadequate and small-scaled cluster housing, the PMT demonstrates a fundamental planning programme that supports the basic needs of this community. The *surau* has become a central node for the PMT community and is used to organise various events and activities in between prayer sessions. However there remain issues of concern raised by the respondents. These related to the safety and difficulties in coping with shared toilet and bath, outdoor kitchen, as well as the elevated house design.

## **5.7 Negotiating with the architects**

### **5.7.1 Workshop with the architects**

Subsequent to the fieldwork in Kuala Krai, a workshop was organized on 19<sup>th</sup> December 2015 with architects involved in post-disaster responses (Figure 5.43). This workshop was intended to acquire insights in response to the post-disaster recovery and responses from the architectural point of view. This also allowed reflection on current architectural thinking, particularly in practice and in relation to a certain flood situation that is uncertain in scale.

The UNFCCC scientific report (UNFCCC, 2014), highlighted across 100 years modeling of climate change predictions that the rise of sea level may cause frequent floods. Meanwhile, locally the Malaysian Meteorological Department focuses on climate change scenarios in





Malaysia (Malaysian Meteorological Department, 2009). The past and recent floods that happened were of great concern (Fredolin Tanggang, 2008) as it affected people and their socio-economic conditions in vulnerable floodplain areas. Thus, this question the role of local architects in dealing with post-flood recovery and responses, specifically on the relocation of flood-affected communities in both Kota Tinggi and Kuala Krai. This remains the main question discussed throughout the workshop. In addition, post-flood issues were normally associated with rebuilding cultural properties and socio-economic elements, and both of these aspects were part of the discussion. While the latter relates to how economic-related response benefit local businesses and trade, the former - in reply to the context of risks - refers to the way people interpret and adapt to the risks, and how these influence their vulnerability towards threats such as floods.

The workshop continued to discuss the general views on flooding in Malaysia as an impact from global climate change scenarios. I had argued that emphasizing both the impact of local and global is imperative as more frequent flooding events associated with climate change can exacerbate the human catastrophe associated with these events. Hafiz responded that architect's involvement is to remain focused on ground level. However, he posited that understanding climate change will continue to be an important component in order to be able to understand and respond to the issues on the ground. He indicated that, *"The world leaders should discuss on climate change, meanwhile architects should focus on [the] micro level that involves community on ground level."* Although, the architect's role and position is more significant within the community as a 'builder', Hafiz justified that, *"architects should have a knowledge background on climate change and its impact, in order to response at micro level."* Therefore, architects should equip themselves with both the broad or global as well as specific or local understanding of the matter at hand.

#### 5.7.1.1 Disaster and risk reduction

In order to understand the circumstances of floods disasters in Malaysia, it is crucial to look at both the context at international and national level. Both contexts operate inseparably as issues between the two influences with the policies, the planning as well as the implementation on either side. In light of this correlation between the

international and national or local context, participants were asked to describe their views on post-disaster in terms of architectural aspects and to explain how they understood this correlation, how it was relevant or even existed. In light of the connection between climate change, flood and its implications towards people, the participants were asked to describe their understanding and their position on this matter.

#### 5.7.1.2 International level

Hafiz mentioned that for disaster mitigation at international level, *“The world has started [implementing] Hyogo Framework which was agreed in 2005 in Kobe, Japan, [and] implemented until 2015. And from 2015-2030, Sendai Framework is used.”* He described that the frameworks, *“should [only] be the ‘mould’ or guideline for each country that signed the agreement, including Malaysia.”* However, he raises the concerns of, *“how do we (architects) reflect the Sendai Framework into our local framework?”* as he identified that, *“...This is where we [Malaysia] are lacking at the moment, (...) [which is standard for] Local framework including adaptation to our local culture, socio-economic condition, local geographical condition and etc...”*

Furthermore, the questions revolved around the extent to which architects or local policies were even concerned about the discussions taking place at an international level. Though this may not be obvious, the aspect of climate change globally clearly has an impact towards local conditions. However, the concerns that I think we have in practice only focus on the national level, attempting to adapt the visual of cultural impetus or regional green architecture, rather than trying to adapt to knowledge of the changing climate occurring worldwide.

#### 5.7.1.3 National level

Hafiz further described his views towards Malaysia’s policy on disaster management. He explained, *“... The highest (government policy) that we have now is Majlis Keselamatan Negara (Malaysia National Security Council - MNSC) Directive 20. It was originally formed to handle the case of Highland Tower in 1993,”* albeit the problem derived from a minuscule sample as, *“the scale (of the case of the Tower) was very small.”* Hafiz commented that, *“there are lots of things that we are lacking of,”* within Malaysia’s scenarios. One of the issues highlighted was on the

policy level as he mentioned that, *“there is no act on Disaster Risk Reduction.”*

The problem pointed out by Hafiz resonated with recent research on ‘Examining of Issues on Flood Disaster Management in Malaysia’ by Shafiai and Khalid (2016) who addressed that international critics reveal “negative” views on flood relief policies in Malaysia, as the policies were poorly implemented at both stages - during and after disaster. This was noticeably perceived during the post-flood that occurred in December 2014 in relation to the rehabilitation projects for the flood victims (Chan, 2012; Shafiai and Khalid, 2016).

As a consequence of poor disaster management during the 2014 unprecedented flood, the Malaysian government disbanded the disaster management division in the MNSC and took an initiative to set up the National Disaster Management Agency (NADMA). The task was to coordinate government agencies in undertaking disaster issues that were previously assigned under the MNSC (Abd Samad, 2016). NADMA functions to ensure all assistance to the affected people such as flood victims are, ‘channeled more effectively and orderly’ (HAKAM, 2015). In relation to its commitment to both Hyogo and Sendai Frameworks, Malaysia has submitted an interim report of its ‘National Progress Report on the implementation of the Hyogo Framework for Action (2011-2013)’ to UNISDR in 2012.

#### 5.7.1.4 Perception of Disaster

While the definitions implied by scholars and practitioners provide an outline to the meaning of disaster and its categorization such as a serious disruption of both physical and social structures (Guggenheim, 2014; Hussin, 2007; UNISDR, 2016), Saiful had shared a different view. In his opinion, the term disaster refers to, *“...an event that cannot be anticipated.”* He argued it is, *“arguable,”* to describe the flood event that happened in 2014 as, *“a disaster,”* as, *“flood happens (in Malaysia) on [an] annual basis.”* He presumed that the locals had, *“anticipated that it would happen and [therefore] have to adapt with the situation.”* Saiful highlighted that the notion of disaster relates to the element of surprise, particularly in the extent of the scale, however, he argues that the Malaysian flood scenario is mostly predictable, hence Malaysians in general are accustomed to the term *‘musim banjir’* or flood season.

Although flooding is an annual event or even celebrated as a water festival, I hold a different view. The floods occur annually; nonetheless, the intensity, location and times are unpredictable. Even the scale of floods in 2014 was not anticipated by anyone including the respondents, as discussed earlier. One thing to note is that, although perceptions vary, all participants agreed that the, *“government (district, state or national level) should have done more,”* in terms of the policies and implementations.

I also argued that certain factors derived from anthropogenic activities, which vary from economic or political factors, contributed towards the vulnerabilities of the people. Activities such as illegal logging on the hill near to Kuala Krai town had worsened the flood situation and had caused severe damages and loss.

#### 5.7.1.5 Post-flood recovery and response: some critical concerns

Razib identified that there are 3 main issues relating to disaster responses to the 2014 flood which are: (1) *“lack of knowledge about the domestic context”*, (2) *“lack of adaptation in the local context,”* and (3) *“redundancy among parties in coordination during and after the flood occurred,”* such as the lack of organization and distribution of responsibilities. In addition to these, he suggested that those who are helping the victims should have at least the basic knowledge in coordinating and managing the situation to avoid deficiency and redundancy in the recovery and relief mission.

During this workshop, I highlighted that a number of respondents in PMT had reported similar issues on coordination and management of aid after the flood. Although Hazazi emphasized the constructive aspect of post-flood responses and actions - as there were various sources of humanitarian aid and support from local and international organisations, he criticized the consequences of poor post-disaster management by the MNSC. He expressed that, *“without a good coordination, it will cause negative consequences”*. The MNSC Directive No. 20 consists of a number of agencies that are responsible at different stages of recovery. Nevertheless, there are no agencies appointed in the MNSC Directive 20 responsible for the resettlement after disaster (Shafiai and Khalid, 2016). This was due to it being under the sole administration and supervision of the higher authorities (Shafiai and Khalid, 2016), hence resulted variability in the outcome. This suggests that specific actors or an agency need to be

appointed and act as a point of reference for issues related to post-disaster housing or resettlement.

On the other hand, Hazazi emphasized that complaints and dissatisfactions from the affected communities during the flood had often been interpreted as part of “*culture*,” as he explained; “*My cousin involved in flood recovery in Kelantan informed me that they (the affected people) were arguing why the houses built in the neighbouring kampung had 3 bedrooms and their houses were did not?*” Meanwhile, Hafiz pointed out that those complaints were a norm during post-disaster due to lack of coordination or management resulting in the uneven distribution of aid. He considers this as part of, “*fitrah manusia*,” or human nature. Unfortunately, according to Hafiz, it is not an isolated issue only within the Malaysian context.

Further to the issues of users’ complaints, Hafiz added that this behavior may have resulted from the term that he called, ‘*Kecemburuan Sosial*,’ or ‘Social jealousy’. Similarly, this topic was highlighted by Syed Zainal Abidin in the Kuala Krai workshop that I participated earlier in March 2015 (Refer to section 4.7). During the workshop, Syed questioned the importance of post-disaster reconstruction guidelines for fair management in order to avoid what he calls “*local sentiment*”.

Hafiz reflected this in a bigger context and explained that, “*On the higher level, the United Nation Office for the Coordination of Humanitarian Affairs (UNOCHA) created a tool called ‘Who does What Where?’ for coordination and analysis during the emergency situations [...] from the distribution of blankets, biscuits (food) to the construction of a house*”. It is imperative that during the flood aid, all parties should have a clear definition in their roles and the type of assistance or responsibility they are involved in.

Hafiz is affiliated with Mercy Malaysia and had been involved in a number of humanitarian works in Indonesia including the Earthquake in Nias, flood in Padang, and tsunami in Aceh, which he termed Indonesia as the, “*Supermarket of Disaster*”. He then shared his experiences gathered during humanitarian work for tsunami victims in Aceh in 2004 and explained how the Indonesian government dealt with post-disaster reconstruction issues. This includes the issue of social jealousy by establishing their own specific and localized tools of ‘Who-Does-What-Where’. He continues: “*What is great about Indonesia during*

*the case of the tsunami in 2004 is that the President Sosilo Bambang Yudhono appointed Bapak Kuntoro Mangkusubroto from Menteri Perekonomian dan Kesejahteraan Rakyat (Menko Kesra) to form an agency called Badan Rehabilitasi and Rekonstruksi (BRR) to coordinate 'Who, Does, What, Where' in the Indonesian version to suit the local context (...) 5 months after the tsunami."*

This reflects how adjustments are being made from the tools designed by UNOCHA to be proficiently carried out by the government within Indonesia's local context. The tools have set a specific guideline concerning architectural design for architects or designers to follow, as Hafiz elaborates further: *"For example, a house has to be anti-seismic design, with a porch, a toilet and 2 bedrooms. The area should be between 36msq to 42msq. No more, no less."* However, he pointed out that his Mercy Malaysia team had learnt a lesson and said, *"We (Mercy Malaysia) had built emergency houses earlier (before BRR tool was introduced) and we provided the victims, [houses] of 56msq each, which was our mistake."* This resulted in an unfair situation among the people affected. Apparently, this matter had resulted in similar issues in Kuala Krai, which Syed pointed out as, *"An adverse emotional effect to others."* As a result, Hafiz revealed that, *"people from other kampung questioned about this (unfair comparison of house size) and they felt jealous."*

The next issue addressed within the post-disaster context in Malaysia was the question of what could be learnt in the architectural reconstruction in order to reflect local practice. Hafiz highlighted, *"this [is] what we did not learn from and reflect in our Malaysia context."* Realising the importance of adapting the international tool kit within the local level, he then urged that the Malaysian government, *"should have [adopted] this kind of tool that defines the framework so architects will have to follow the requirement when disaster occurred."*

Furthermore, in response to the dissatisfaction and 'social jealousy', Hafiz suggested that, *"It is important to set up an agreement both at the strategic level and at the implementation level,"* in order to achieve successful and more organised coordination during and after the disaster. However, he added that the implementation procedure will depend on the, *"negotiation at local level too"*.

#### 5.7.1.6 Defining Terminology: Ad-hoc shelter, transit shelter, permanent house

Providing housing and shelter is one of the most demanding tasks after disaster (Davis, 2011), as it operates in a, 'condition of uncertainty' (Tauber, 2014). It is a complex process (Burnell and Sanderson, 2011) that not only involves the reconstruction of homes but also the rebuilding of, 'infrastructures and communities, livelihood and entire cities' (Boano and García, 2011) that requires multi-departmental involvement and wide range of skills set within a critical period of time.

There exists a rich body of literature discussing disaster management and technical solutions within post-disaster issues. However, this study emphasizes the challenges and risks facing the production of post-disaster spaces that requires further enquiry. In section 5.6.1, this research demonstrated that there were several displacement and relocation processes that took place before the affected communities could move in to their permanent housing. The various and often difficult outcomes at every phase were also observed during my fieldworks. These questions my perception of what is post-disaster shelter, a 'transitional shelter' or even a permanent house after the disaster? Also, what are the elements or characteristic of these houses that underline them.

During the workshop, the terms ad-hoc shelter, transitional shelter and permanent housing were brought into discussions in order to reflect participants' views and opinions. Moreover, this relates closely to the question of what is the architects' role and relevance in the post-flood reconstruction? As Hafiz explained, it is important to establish the definition and understand the requirement of an ad-hoc shelter, transit home and permanent house, *"to help people understand the working framework and guidelines"*. He said that the terms are often interpreted as, *"ad-hoc is a tent, transit is a plywood house and permanent is a brick house"*, even though the understanding should be rather deeper.

##### a) Ad-hoc shelter

Ad-hoc shelters are common in disaster scenarios (Audefroy, 2010; Burnell and Sanderson, 2011; Davis, 1978). Often visualized as temporary structures that people inhabit for a short time, the provision and deployment of these shelters are carried out 'ad-hoc' or immediately

after a disaster. Hafiz expressed the, *“need for a working framework that describes what ad-hoc shelter should be”*. He highlighted the diverse types of ad-hoc shelters - both in-situ and pre-assembled - built after the flood in Kuala Krai from different donors and agencies, and emphasized on its suitability. He commented, *“The ad hoc shelter by Shelterbox provided for each family earlier was not suitable for our weather, because it was too hot inside it. Meanwhile, others brought in canvas materials to built in-situ.”* His comments on the pre-assembled tent, the ShelterBox that was unsuitable to Malaysia’s hot and humid climate were reflected on findings obtained during the fieldwork; it can be seen that modifications had to be made by the users for it to be appropriate to their current conditions. This was opposed to the claims made by the ShelterBox Malaysia representative, reported during their presentation in the earlier workshop I attended (Building community & settlement resilience workshop). In contrast, although the in-situ shelters allow the flexibility in configurations to suit specific local conditions, the preparation and construction may take longer than that of the pre-assembled tent such as *Shelterbox*.

Sharing his experiences of the tsunami in Aceh in 2004, Hafiz informed that, *“The design of shelter provided by Mercy Malaysia was improvised from the UNHCR canvas shelter.”* He elaborated further about the design modifications that had been made and demonstrated the relevance towards users’ daily activities, *“What we (Mercy Malaysia) did was to increase the shelter height to 4 metres with a door and windows. Why 4 metres high? To provide them with ample space to perform their ‘solat’ (religious prayers) as most of them are Muslims. Because Indonesia is a tropical country, the floor was also lifted, to avoid from rainwater... east-west sun orientation. And there was a space at the back of the shelter for them to cook. So these small changes in design did affect their lives [...].”*

#### b) Transit(ional) shelters

The phrase ‘shelter after disaster’ carries a number of different meanings and perspectives. In the editorial article, “Whose reality counts? Shelter after disaster,” Burnell and Sanderson (2011) wrote that the term refers to ‘temporary structures beyond tents and efforts by aid agencies to construct permanent post-disaster housing’. However, the Humanitarian Emergency Response Review (Ashdown, 2011) refers to ‘transitional shelter’, which describes a covered space that is more



appropriate for habitation than a tent. However it is still not intended to be used as a permanent structure or house, it is usually designed with an intended lifespan of, 'between 3 to 5 years until proper reconstruction is achieved' (Ashdown, 2011).



Figure 5.44:  
Shelter provided by  
Mercy Malaysia (above)  
and UNHCR (below)  
during the tsunami in  
Aceh in 2004. Source:  
<http://hafizamirrol.blogspot.co.uk> and  
[www.unhcr.org](http://www.unhcr.org)



The question of the definition of transitional shelter was raised during the workshop discussion. Chapter 1.2 frames the meaning of transitional shelter as a place that was better than a tent and used as a temporary stay before moving to a permanent house, which should also respond to a variety of cultural and psychological requirements (Figure 5.44). Using the term 'transit house' throughout, the discussion focuses on the transit shelters in PMT that were developed by Mercy Malaysia. Hafiz emphasized the feature of the shelters that relates to durability and

materiality, *“... the transit house we did in Kampung Tualang, we actually assumed that it will last for the maximum of 2 years. But the most efficient is one year and with the assumption that the government will provide them permanent houses. So, you have to anticipate that the house will fall apart when it reaches its maximum term because that is what we prescribed. We want to build them fast ... 1 unit within 2 days but able to last until at least 9 months. So, the agencies responsible for permanent housing should have made it ready within these 2 years [...].”*

There is a contradiction in the transitional shelter lifespan. While the Humanitarian Emergency Response Review anticipate the shelters to last for 3-5 years, PMT was designed for a maximum of 2 years. It is then expected that these affected communities will be embraced by other ‘agencies’, either the government or private donors, to provide them with permanent housing.

However, Hafiz stated that there was a lack of interest in building transit houses among agencies due to the, *“lack of understanding about the requirement of transit house”*. According to him, though it involves extra cost, providing a transit house is important because it relates to their, *“psychosocial impact and there will be a gap in between the transitional period if it is not provided.”* Meanwhile, Hazazi questioned whether, *“temporary houses are necessary to be used temporarily or could be converted into a permanent house, so the work and effort does not have to be repeated twice?”* Yet, this also has its problems as the process has to take into account different forms of spatial intervention within its post-disaster settings, particularly related to land-ownership issues.

This is not an isolated argument as it happened in January 2010 after the earthquake in Haiti (Burnell and Sanderson, 2011). While Hafiz prefers the reconstruction to be part of the recovery process (psychologically and socially) a study by Clermont et al (2010) emphasized that many informants labeled transitional shelter as *“a total waste of money”* and *“counter-developmental.”* Similar to Hazazi’s suggestion on the possibility for conversion to permanent houses, the function of transitional shelters often becomes permanent which, *“suits NGO timeframes and marketing obligation rather than people’s or users’ needs.”*

In this thesis, I agree with Hafiz's opinions on the grounds that transitional house provision addresses the gap in the post-disaster recovery timeframe. Similarly, this study suggests that the transitional shelter in the transition phase could be considered a 'pilot test' or a 'field study' to acquire community feedback in regards to the planning and design of the permanent and subsequent phase of housing. Thus it is important for architects and designers as a point of reference in rehousing programs - especially those involved in the development of permanent house resettlement. It is argued that this resettlement period provides adequate time for architects to analyse and reflect on critical issues pertaining to specific culture and community needs while establishing genuine community engagement.

#### Permanent house/housing

During the discussion, Hafiz also shared his humanitarian experience in Aceh. He recalled, "*At first, they described that it is a house with half brick (at the lower part of the building) with timber on the upper part. Then, some of them did not agree with it ... [arguing that] all [parts of the house] have to be bricks. But a professor convinced that there is nothing wrong in having a timber house as a permanent house because all this while, most Indonesian people lived in timber house.*" The argument demonstrated that even the local professionals and academicians had scrambled to reach a common understanding to define the right kind of permanent local housing.

Roosli and Collins (2016) identify permanent housing as, 'the last stage of housing recovery, aims to be final solution post-disaster to provide housing individually, which would fulfil the needs of the inhabitants in a relatively much longer period of time.' On the other hand, Silva (2011) argues that housing, 'should be identified as an issue of quality as well as quantity'. Housing is not simply describing as a physical building, however it, 'should be a process that engenders an emotional connection to one's house and community' (Silva, 2011). In other words the housing has attached and embodied meaning. The post disaster recovery in Kuala Krai demonstrates that several donors including federal and state governments, NGOs and private individuals were involved in the provision of post-flood housing for both reconstruction and relocation. This resulted in the diversity of design and planning outcomes. Although the design of the Federal government's post-flood permanent house scheme was under the supervision of the Public Works Department,

Roosli and Collins (2016) point out that only one design was approved at the federal level. However, there were ‘no specific guidelines for building housing after disaster especially in disaster prone-areas’.

### c) Relevance of defined terminology

Razib agreed to establish the definition and requirement of stages in disaster outcomes as he relates it to the resilience of communities. He postulated that, *“The rationale of having ad-hoc shelter, transit and permanent house is because when we talk about returning to their normalcy ... affected communities were already in despair due to their loss. First of all, we need to provide their basic needs; which are shelter, food and drink. They will stay in the shelter for one, two or maximum of three weeks. I don’t think they can stay in there for a longer period. Then, we provide transit homes that were much more acceptable to continue their daily lives. So, ad-hoc is for basic needs [...] then, we talked about transit houses, they start to build their own economy [...] For example, the PMT by Mercy was aimed to rebuild their economy. First, they got the land. Then, they built these houses using the most common materials that kampung people know how to handle; such as plywood, timber and zinc. And it is fast. Mercy hired the tukang kampung (village carpenters) themselves. Each house cost about RM15,000 and can be built by 3-4 persons. Then, completed in 2-3 days. So, those who can build faster, have the opportunity to [claim the labour more and] obtain extra money. And basically, you are helping the whole community to bounce back too [...] They can have proper place to feed their children, the kids can now start to go to school, the husband go to work or search for a new job.*

#### 5.7.1.7 Architects role and relevance in post-flood recovery and response

Saiful shared the same opinion on having a, *“solid line (distinctness) between transition and permanent house”* with Hafiz and Razib. However, he remarked that it was difficult to, *“talk about architecture without acknowledging the higher level’s (ministry or policy maker’s) decision-making”, because “they are under one umbrella and architect is just right at the bottom of the chart”*. He insisted that, *“if the policy, method and strategy are right, then it will only work”*.

Hazazi highlighted that architects play a bigger role in establishing spatial requirements in post-flood situations as they are trained to provide solutions within a particular context. He describes that architects are problem solvers that are able to respond well when disaster and chaos occurs in a specific place and situation. He added that, *“the most important objectives on flood responses design is to avoid people [getting] stuck in the flood, save lives and have access to food and clean water supply [...] The solution to these scenarios, in terms of architecture is not necessarily through architectural approach, however may be through a particular systematic approach”* Nevertheless, he explained that any solution through design is subjective as it is based on the architects’ preferences and their design approach. Hence, the various design outcomes.

The long process of rebuilding the community after the flood requires a rigorous study from multiple aspects. Hazazi expressed that, *“Architects cannot give solution to every problem. But we can contribute to the field where we have the expertise.”* According to him, the affected community may return back to their original settlement if their current settlement does not meet certain basic criteria. In order to help them, architects, *“can provide appropriate spaces or programs or contents”*. He elaborated further; *“Post-flood is usually associated with health issues. So, providing clinics within a certain perimeter is essential”*. This may also relate not only to physical health but also to psychological well-being.

#### 5.7.1.8 Challenges in reconstruction liability

Razib suggested that it is important to learn and discover through post-flood responses and recovery from the beginning. He explained: *“So how do we know the needs of the people there? We observe from ad-hoc, transit and permanent. And ask yourself why this is happening?”* In addition to this, Razib suggested that analysis on psycho-geographic factors have to be implemented in the design and context: *“So, returning back to the psycho-geographic factors that we have to implement - we have to understand it 100% (entirely). Again, it is about context (...) but when we say context, the picture is very big (...) therefore we need to be more specific.”*

5.7.1.9 How can the architects 'add value' to post-disaster reconstruction?

a) Understanding indigenous knowledge in weather forecasting

The term indigenous knowledge according to UNESCO is 'local knowledge as knowledge generated from the observation and experience of the surrounding situation (environment) by a set of people, who are ultimately related to particular situation'. The Fourth Assessment Report of the IPCC (2007) highlighted that indigenous knowledge 'has value not only for the culture in which it evolves'. It is also a 'sophisticated knowledge of the natural world' that is opposed to scientific knowledge that is generally referred to as 'modern knowledge'. Indigenous knowledge has developed an 'intricate system' of gathering, predicting, interpreting and decision-making in relation to weather (Cruz et al., 2007). It relates closely to people's practice and beliefs and it is therefore crucial to understand this traditional ecological knowledge. Mavhura et al (2013) highlighted that indigenous knowledge plays a significant role in reducing the impact of flood as it is often 'beyond formal education about environmental hazard.'

In this workshop, Hafiz criticized the conflict between government agencies due to confusion of work divisions. He explained: *"The flood management in 2014 was a bit (of a) chaos between the government agencies."* However, he acknowledges that the indigenous knowledge among the affected communities became the main factor that reduced their vulnerability during the 2014 flood and expressed that, *"only a small number of people died."* This raises the question of how local people acquired the knowledge to indicate the unusual situation leading to a flood, which had saved their life? He explained that, *"the overflow flood water level had surprised and forced them (locals) to run quickly to higher places nearby because they knew that it was an unusual flood condition."* It is therefore important to understand and incorporate the local indigenous knowledge as part of the process particularly in terms of resilience measures.

b) Study the patterns of settings and activities (observe)

Hafiz reflected on the importance of understanding and increasing awareness of the context through the chronology and timeframe of a disaster response such as in Aceh. He further related this

to the human needs and the levels of psychological stress. The process of resettlement took two weeks searching for suitable land and clearing it, while it took another two weeks before they could start to design and fabricate the ad-hoc shelters.

The ad-hoc shelters were completed for the affected communities four weeks after the tsunami, and they stayed in them for about a year. He explained that, *“After 10 or 11 months, we can see the numbers of babies born (within the settlement). So, we knew there is a biological need. However, after their babies were born, they started feeling the stress again. This is because the tent is not suitable enough for the babies due to hot (tropical) weather. Overall, the timeframe is only about one year and we work hard to complete the house before Eid in November. Otherwise, they will become enraged.”* Meanwhile, Razib pointed out that, *“we cannot relocate them blindly without any research. They have been living there for more than 30 years (...) and suddenly the government said they have built a permanent house for them somewhere to live in.”*

Meanwhile, Saiful suggested that the process of formulating a post-disaster space and the procedures of relocation, planning and designing of new settlements has to resonate with the characteristics of the original settlement. He explained further through a case study of Park Hill council housing estates in Sheffield, United Kingdom which in his opinion is a *“successful development”*. He clarifies: *“The architects imitated their original settlement and brought the village into the high rise. It used the concept of streets in the sky. Residents who previously lived at the same street, stayed at the same floor level here. There was once a ‘culture’ of milkmen delivering milk from door to door and the corridor of this flat was designed wide enough for the milkmen to travel with their transportation. Your old neighbour remained your neighbour here and each floor was given a name of the street they lived in before. For me, it works well. In the sense that once they move in there, they automatically feel the sense of belonging. However, the development experienced poor management and social problems started to increase. But, actually the case study is quite successful. [While] this is a high rise, in the Kuala Krai case, maybe landed permanent types of houses.”* Hafiz believes that theoretically, the idea to evoke the *kampung* characteristic and imagery could work. The formal and visual appearance of *kampung* could presumably create a familiar scene for the community to relate to.

In this section, I have identified that studying the patterns of site settings and activities before the relocation is imperative to accommodate the affected communities appropriately. Similarly, the original settlement has attached meanings, which the built environment professionals have to respect. It is also important to cater for basic human needs such as food and medicine in post-disaster situations. This primary focus was also highlighted by Silva (2011, p. 123), as he elucidates that architects and designers should ‘investigate the place, its use by people and how it is understood by people’ to avoid unresponsive outcomes to the realities on ground.

In analyzing this section, Saiful’s suggestions of ‘repeating’ the feature of original settlement with adaptation to the new environment, brings the question of what are the most essential features of a settlement, especially the original settlements? And how can we discover and translate the elements of an original settlement that were most likely unrecorded and destroyed during the flood? These issues highlight the importance of anecdotal evidence from users’ participation and engagement during the production of post-disaster settlements.

#### c) Listening to the voices of resettled community (participation)

Observation may not be enough to understand the culture or the needs of the community. Thus, listening to the voices of the resettled community is vital. Silva (2011) mentioned that participation of the communities in the creation of their home environments are an essential factor within the context. The communities not only engage with the building process but also in shaping their living environments.

In response to the example by Saiful on the Park Hill development, Razib reflects the situation within the local context. He expressed that, *“we (architects) are not listening to them (affected communities) on what they really need? We knew that people living in the low cost areas such as kampung often run businesses at the front or near their houses, but when we relocate them, we did not provide a similar infrastructure... we knew most of them are Muslim, we should provide surau (small praying building) for them to perform their prayers and as a place for gathering”*. Apart from that, Razib raised the question of, *“How can we educate them before we relocate them?”* He continued to express that it is important to educate people with a specific set of skills training and program as part of the planning and design strategy. *“It could be done*



*through a package of skill training during the transit period. Because physical approach could not solve every problem (...) If you refer to Rem Koolhaas in his book S, M, L, XL, they talked about program. What is the program in 5 or 10 or 20 years ahead? Because we have a tendency to fail in thinking about program when we design buildings”.*

Hazazi added that, *“the sensitivity towards the norms within their original context make it successful or otherwise will create social problems (...) Probably, they had three or four rooms in their old house and now only have two. This may lead to social problems too.”* He elaborates further how irresponsible design to locals’ daily activities may leads to design failure. *“In the past, they stayed in a timber house and now in an apartment or flat. And we think it is best for them. But, we overlooked that they have been living like that (in timber houses) for years, where some of them open a home business at the front of their house, their source of economy... but now they have lost that space, the kids didn’t have a space to play and it’s problematic”.* He emphasized that this was due to architects not understanding the context they were working with. In addition, he emphasized that there were other aspects to be considered including land and financial constraints of the development.

Though Razib raised the questions of educating the users or affected communities, I think the same questions should be reflected back towards the architects. What is the knowledge that architects have to acquire? Which skills are necessary to work in the specific context of post-disaster?

#### d) Designing space rather than specific object

The discussion continued on the inquiry of how to design and deliver a good permanent house for resettlement? Hafiz pointed out that, *“input from the kampung or affected people is essential and we should treat them as ‘normal’ people that were affected by disaster, as they have their [own] rights to be protected as well.”* Hence, he believes that architects’ or designers’ mind-set of *“designing for disaster victims who shall receive the most minimum while being thankful”* should change. In the case of PMT and Kampung Telekung, Hafiz described that, *“the PMT was treated as a [community] space, not as a single object. However, the Kampung Telekung [development] seems to be designed as a single object: House, house, house, [with] no green space”.* This resonates with the views of Eko Prawoto, an Indonesian architect who addressed this

issue during the earlier workshop attended (Section 4.6), stressing the importance of seeing flood-affected people as ‘a subject rather than as an object’.

e) Acknowledging the reason or motive

Hazazi highlighted the importance of acknowledging the common reasons flood-affected people preferred to stay in *Kampung*. He outlines three main reasons that may have influenced their decisions; *“(1) they are comfortable living on their own land for generations, (2) most of their family members are there and (3) they already have a stable job [nearby]. Therefore, when they were asked to move out, their needs are different. Definitely it is impossible to create the new settlement exactly like the original one, but we try as much as possible to make them able to sustain; such as create better economy and jobs.”* He criticized the term he called a ‘*subsidised mentality*’ that people from both funders and receivers has to change. Everyone needs to understand that, *“the aid and donations are [only] a starting point for the flood-affected communities to rebuild their lives,”* and suggested to, *“start rebuilding programs during the period of any temporary accommodations such as providing empty plot of lands for farming, or planting seedlings, for communities to sustain their living or creating new job opportunities.”* He added that, these programs or activities, *“will help them build up their economy (...) to bounce back from disaster, while being relocated to new settlement”*.

f) Learning from others

Having a background as an urban designer, Hafiz stated that, *“the typical displacement process is almost similar to the typical gentrification process. Displacement may either create new communities or an existing community being displaced elsewhere.”* He stated that a typical displacement was an opportunity to establish a controlled resettlement. Hafiz shared his case study of a resilient resettlement in Taiwan. Initiated by the Red Crescent International, the new resettlement was an exercise to relocate the original settlement 120km away, due to earthquake. However, the, *“resistance among them (communities) was very strong because they, especially the elderly, had a strong attachment to that place (original settlement).”*

Nonetheless, Hafiz referred to the resettlement program in Taiwan as a successful relocation programme. It had been carefully

analysed and reviewed by the users, who inhabited the place throughout the process. He explained that, *“the young generation moved out to find jobs elsewhere especially in the city, the elderly group remained behind [...] The first public spaces they built were a playground and a field. This is because the younger generation had left their children with their grandparents. So, the playground and field were necessary. And then, they built a community hall for the elderly to participate in programs such as sewing classes etc., followed by an in-house clinic and roads. Practically, they built the entire (and mandatory) infrastructure first.”* In terms of the types of houses provided, Hafiz explained that, *“Houses provided varies. There are single-storey units, two-storey units, big and small areas to cater for different conditions and needs. And because most of them are farmers cultivating passion fruits, they were provided with a plot of land for them to continue their means of livelihood. So you can see that the period of architects’ involvement in this development is very short but architecture had play an important role by building the ‘foundation’ for this project.”* Hafiz claimed that the project was a perfect precedent for resettlement undertakings in the Malaysian context as he reassured: *“And this was in Taiwan (...) which is geographically, economically and theoretically similar to Malaysia.”*

#### g) Recovery time frame and consequences

While all participants shared their views on community engagement and context awareness as part of the proceedings in post-disaster reconstruction, it led me to raise the question of the recovery timeframe. As post-disaster recovery and response action are a time sensitive affair, I illustrated the international disaster recovery timeframe (figure 6.2) and also the proposed recovery timeline by PAM in section 4.6. In response, Saiful pointed out the need to understand the rationale behind the proposed timelines before it can be adapted to suit the local context of a particular disaster recovery program. Hafiz confirmed that, *“The international timeframe is designed based on certain criteria for a general guideline but we (Malaysians) can improvise according to the local environment criteria.”*

Razib continued to emphasise that the understanding of a context will influence the recovery and response timeframe and its success. He gave the example that, *“if the disaster is severely affected, there will be no flexibility and this may affect the mobilization of aids for the victims due to limited accessibilities”*. In contrast, Hafiz finds that it is ‘inessential’ as it depends on the nature (the natural condition during

post-flood), and took this as a reason for ineffective disaster relief. Hafiz further clarified that, *“the disaster scenario is connected to both natural and fabricated condition [...] meanwhile, we can obtain input from the health experts or psychologists (for psychosocial issues) - such as how long the people can survive in a tent? And how long the people could stay in plywood houses without experiencing the sick building syndrome<sup>57</sup>? So, these are the ‘fabricated’ scenario that we (architects) can or should design and control.”*

## 5.7.2 Interviews

After the workshop event, an interview was organized with an additional number of architects including Norazam Abu Samah. I have been in contact with Norazam since April 2015, to discuss on his experiences and thoughts from his expansive humanitarian work related to my research. I managed to meet him during my second fieldwork in January 2016. I came across Norazam from the ‘Building Community & Settlement Resilience Workshop’ organized in Kuala Krai, Kelantan in March 2015. He presented a 15-minute lecture on the topic of Resilient Community. He is an architect with more than 20 years of experience and 15 years in humanitarian works with Mercy Malaysia. The objective of this interview was to gain insights on his professional experiences as an architect actively involved in global humanitarian work. More importantly, the interview was to discuss his personal and professional point of view on the circumstances which occurred in Kuala Krai.

### 5.7.2.1 Architect as master builder

Norazam’s background as an architect had influenced his humanitarian assignments. He envisioned the architect as a “master builder” and personally perceived architecture as a complete cycle of project management. He highlighted five basic steps that were essential in supporting the cycle; initiate, planning, execute, control, and close. These were steps for architects to be aware of in order to build a successful humanitarian post-disaster programme. He argued that, *“Architecture is not about buildings but building lives”*. Though realizing

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<sup>57</sup> Sick building syndrome (SBS) is a medical condition-affecting people living in a specific building. The victim suffers from symptoms of illness typically marked by headaches and respiratory problems attributed to prolonged time spent in the building. These symptoms tend to disappear when victims are away or outside of the building.

the complexity of post-disaster response and recovery, he emphasized that the architects who are also humanitarian operatives, should not only focus on building a physical entity alone. Rather, they need to identify local issues, assess the constraints and design a specific programme to make sure that the affected communities are ensured to receive quality assistance, while they endured the process of restoring their livelihoods.

#### 5.7.2.2 Architecture for disaster

There are three important processes in humanitarian procedures according to Norazam, they are: (1) emergency responses, (2) recovery (post-disaster), (3) developmental and preparedness. Focusing on architectural concerns, there are three types of actions related as follows:

- i. Rehabilitation - Repair works are mostly for critical infrastructures such as roads, hospital and school. However, in Malaysia, both government hospitals and schools are under the supervision of Public Works Department.
- ii. Rebuilding/ Reconstruction
- iii. New building (Using the Build Back Better<sup>58</sup> approach) - Existing buildings are reused with new programs and activities.

#### 5.7.2.3 'Local is the first responder to scenarios'

The involvement in humanitarian works is an opportunity to work closely with local inhabitants on the actual ground. It is a genuine period to observe real life situations beyond normal perspectives to help others that didn't have the chance to live in better conditions. As Norazam explains: *"As humanitarian workers, we are looking and focusing on the social impact that occurred after the physical impact, particularly towards the community life."* Here, Norazam emphasized that houses are important assets to the community, in which he elaborated further; *"When the house is destroyed or wiped out, they seem to lose their value of life which has always been their pride. All this while flood has been a norm for them, but this time they have to admit that this situation is happening to them - forcing them to stay in a shelter - which they themselves are not sure what will happen in the future. Therefore, acknowledging and understanding their needs, living and staying with them in their daily life had brought into attention on two critical issues."*

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<sup>58</sup> See more: <https://www.worldbank.org/en/news/press-release/2018/06/18/building-back-better-how-to-cut-natural-disaster-losses-by-a-third>

*First is the awareness and second is the urgent need to change or make adjustments from living in a shelter to a better place.”* This is the key point that he suggested to consider as part of the architect’s role in successful reconstructing after disaster.

This resonates with Sanderson’s views (MASHLM usi, 2013) highlighting that apart from basic psychological needs, people do desperately need their assets, which were built up over their entire life in order to reduce vulnerability and build capacity. This model refers to seven types of assets; (1) social, (2) human, (3) financial, (4) political, (5) physical, (6) natural and (7) cultural assets. Sanderson (2013) further emphasized that, ‘the stronger the assets, less vulnerable the community’. Thus, the production of space in post-disaster scene becomes a new challenge for architects to re-think and tackle the issues through design, potentially reducing vulnerability to disaster and strengthens the resilience of inhabitants.

Meanwhile, Norazam expressed that in the case of the Kuala Krai flood, *“most of Malaysian agencies are lacking in experience and did not foresee the requirement of rebuilding houses, neither temporary houses nor permanent houses for post-disaste.”* This was because the scale of the disaster was unprecedented. This raises the question of what will be the social impact on the flood-affected community if they live in ad-hoc shelters for a longer period of time than expected? Thus, this issue further relates to the necessities of providing transitional shelters.

#### 5.7.2.4 Transition(al) shelter

Similar to the opinion of Hafiz and Razib regarding the transitional shelter (section 5.7.1.6), Norazam added that during this recovery phase, the community is ready to move on and seek better living conditions from the previous setting, therefore providing a transitional shelter is essential. *“During their (the flood victims) stay in temporary tents and while many people (disaster agencies) are still focused on small aids to be delivered periodically... I already knew that I had another duty to do next. At this stage, they (the flood victims) did not require that (aids in a form of food or clothes) anymore as the rice supply is more than enough, so as other food... “*

*“So I begin to design a house. I still remember that I only have a long ruler and a piece of A4 paper. I drew a simple house and asked - what is the standard size of plywood? It's 4ft x 8ft. So 4ft + 4 ft + 4ft = 12ft and*

*4ft + 4ft + 4ft+ 4ft+4ft = 20ft. Then, I straightaway decided the size of the house, 20ft x 12ft.”* Here, there are four key design considerations using plywood as the main material; (1) to maximize the material usage, minimize material cuts and waste, (2) familiarity within local skill workers or ‘*tukang*’ (craftsman), (3) swift construction and (4) cheap (material and labour) and it’s convenience. Moreover, this aims to help the locals to restore their financial condition.”

*How can the architects ‘add value’ to post-disaster reconstruction?*

*“As a person with an architecture background, I am trained to think in many directions by looking at the situation in 3-Dimensional. In the post-disaster situation, I am looking at the scene in 3-Dimensional context of donors, funders, beneficiaries and volunteers. And this is a perspective that we need to educate the Malaysian, in general.”*

According to Norazam, there are a number of factors that have contributed to fewer architects’ involvement in post-disaster recovery and response in Kuala Krai. He addressed the reason that, *“most architects are only willing to spend a limited time engaging in post-disaster projects as they usually come and go ‘seasonally’ (...) Furthermore, post-disaster recovery is a non-profit job that may not interest them (...) however, the disaster impact is big. More than 2000 buildings were damaged, 500 schools affected, more than 10 hospitals inundated.”* The fact that on the ground, large numbers of buildings were affected and people tended to focus only on the immediate stage of post-disaster responses rather than on the recovery phase crucially for the long-term. Norazam justifies that, *“Post-disaster doesn’t involve only on emergency responses, but involves recovery programs which are long-term and complex.”*

## **5.8 Conclusion**

The unprecedented 2014 flood disaster in Kelantan provided the opportunity for me to experience and review the actions taken on the ground in post-disaster response. The focus was on the idea of ‘transit time’ (Refer to section 1.2 and 1.3), the period of time where community displacement and relocation due to post-disaster occurs. The aspiration was to reveal where and how architecture during the transit time (in regards to transit homes) can best respond to the consequences of flood disaster. Just as with the case study of Kota Tinggi, this issue was explored through interviews and the respondents’ narratives, fieldworks, personal

observations, as well as a workshop and conversations with architectural practitioners and designers. This case study provided some key insights summarised below:

The monsoon flood is understood as a recurrent, annual threat in particular to people who live in the flood plain area such as Kuala Krai. Although they are equipped with local environmental knowledge or indigenous knowledge on floods, the scale of potential flooding is unpredictable. Therefore, these people are considered vulnerable to flood disasters.

Although flooding is expected and people are vulnerable to flooding, there are no specific guidelines for rebuilding post-disaster homes. Information gathered during the workshop attended in Kuala Krai (Section 4.6) was significant as it helped to establish a foundation for understanding post-flood scenarios. It focused on the issue of rebuilding a resilient community and settlement in particular within Kuala Krai.

The flood-affected community had gone through a series of displacements and relocations during the transit time. Fortunately, at each stage, the places provided for them were gradually improved. Moreover, they were generally able to adapt over time to the life changing and stressful situation.

The research observations focused on a temporary cluster shelter - the PMT, provided by Mercy Malaysia. Here, 33 flood-affected families were offered the maximum of 2 years stays before they are being relocated to other places provided permanently. Although there was pressing need to rebuild permanent homes, it can be seen that their effort was to recreate normalcy / create new normalcy while they were in transit.

It was identified that the PMT residents are not actively involved in any discussion in relation to the development for permanent relocation projects - making them a passive 'end-user' group.



# Chapter Six

## Temporary Homes in Transit Time

### 6.0 Introduction: Discussions of Case Studies

This chapter examines the findings gathered during the fieldwork for both the Kota Tinggi and Kuala Krai case studies, as well as the discussions with local architects. There are a number of studies on climate change mitigation and adaptation through tangible and structural approaches. There has also been much interest in the development of designs for post-disaster temporary shelters, whereby the provision of post-disaster temporary homes is seen as a process rather than a conclusive outcome. Therefore, this study attempts to investigate the practice of developing post-flood disaster settlements for flood-affected communities during what the study defined as ‘transit time’. The affected communities that the study engaged with in the two cases of Kota Tinggi and Kuala Krai were relocated from their existing *kampung*. Both case studies were understood as examples of the community experience of displacement and relocation after the floods.

The local residents of Kota Tinggi and Kuala Krai as well as local architects provided different insights and stories that were important to the research. The residents could provide insights to first-hand experience of disaster and thereafter, coping with their losses and managing the process of finding shelter in a challenging environment, far from their normal life. On the other hand, the architects interpreted their engagement in post-flood disaster scenarios, especially in terms of managing the relocation and resettlement that is often hardly discussed in the Malaysian context.

The objective of fieldwork conducted in both Kota Tinggi and Kuala Krai was to evaluate how the situation of post-disaster was challenged, adjusted and adapted locally through the concepts of space and time. I have sought to reveal and justify the on-ground reality as an essential means to understand the issues of flood response that is often overlooked. It is imperative to understand and gather significant information on disaster experience through the narratives of people, who will often re-construct stories through their collective memories. Meanwhile, the conversations with built environment professionals or

experts such as architects were useful in establishing their views on possible architectural responses post-disaster.

Findings from the fieldwork conducted in Kota Tinggi suggest that communities relocated to a new settlement (Desa Sejahtera), as part of the long-term post-disaster response, were in a dilemma. This was due to the new terraced housing developed with a lack of understanding towards local context, environment, place making and culture. This study acknowledges that there is a challenge to translate and understand the inspirations of the *kampung* setting within the new resettlement. Furthermore, most of the properties and characteristics of the original *kampung* were destroyed during the major flood, adding to the loss of local identity.

The study also identified that early involvement from local residents in the design and development of new settlements is paramount. However, the study seeks to answer the question of, “why and how they (communities) could be involved?” and this has to be associated with, “what form of involvement?” as well as “when to involve?” The 2014 flood disaster, which occurred during the first fieldwork in Kuala Krai was an opportunity to experience first-hand the ongoing post-disaster responses, investigating how the transition situation - physically, emotionally or culturally, could fundamentally support the qualities of a new permanent resettlement. Concurrently, the study had inquired and observed the communities’ in-transit residency period in one of the few temporary communal developments, named Perkampungan Mercy Tualang (PMT).

The discussion in this chapter attempts to bring together three different perspectives, which are, the experiences and observations gained during fieldwork, the personal narratives of flood-affected people, and the accounts of built environment professionals, involved in post-disaster response and reconstruction in Malaysia. The study is focused on dwelling in the transition period and the objectives have been to identify common concerns as well as the isolated issues related to post-flood recovery and response. Moreover, this relates to one of the research questions on how architects perceive the issue of flood response, and why and how the architects’ role is relevant to the post-disaster situation, particularly during the transit time.

This chapter is divided into two parts. In section 6.1 the study revisits the case studies conducted (narrated in Chapter 4 and 5) and the

assessment of the narratives of post-flood disaster people acquired through interviews and personal observations during fieldwork. In section 6.2, the study puts together the outcome of the architect's narratives gathered from the workshop and interviews organized (refer to section 5.7). The study is then concluded in section 6.3.

## **6.1 Reflection on the process: Case Studies in Kota Tinggi and Kuala Krai**

The fieldwork conducted in Kota Tinggi and Kuala Krai over several visits has generated a number of insights. Most of the respondents were accustomed to flood events and were used to adapting to them in their daily routines. However, the impact of the major flood catastrophe was destructive and considered as the 'turning point' in their lives.

### **6.1.1 Narratives: Imagining the flood disaster**

The unusual and time-bounded flood disasters have an enormous impact on the respondents. Flood is a natural phenomenon that occurs nearly every year and is a familiar occurrence to people who live in the flood plain areas of Peninsular Malaysia. The term '*musim banjir*' or the 'flood season' is a common phrase used and ingrained in the way they live and react to this season. The conversations with respondents revealed detailed stories on some of the major floods that they had encountered. The respondents retold the stories through personal narratives or autobiographical accounts in order to express their experiences, emotions and to make sense of the unprecedented sequential scenes of flood disaster and trauma that were unimaginable to others.

I observed an interesting element in most of the narratives. They began not by describing their experience of the flooding, but rather by recounting their own past that involved elements of character and symbolic identity. These were integrated with their flood experiences gradually, as their stories developed. One of the significant details was reference to Muslim prayer times such as "after Maghrib" or "during Isya' prayer" in timelines of the disaster narratives. The respondents described flood as part of the Earth's dynamic situation that is beyond their control but Allah's (God). Humans are interdependent with nature.

Furthermore, in these narratives, the respondents frequently described their experiences as identical to other world major disasters in a form of visual impressions such as the tsunami that happened in 2004

in Indonesia. Even though it is well known that these were two distinct types of disasters and context. The major flooding in Peninsular Malaysia was mainly due to heavy rains and storms during the monsoon season, whilst an earthquake had caused the tsunami in Indonesia. These comparisons were made especially in relation to the aftermath impacts of the flood connected to a particular kind of physical and psychological conditions, that is destruction due to water.

For example, in the case of Kota Tinggi, the respondents described how the cars had drifted away and stacked over each other, and the muddy houses and roads. Meanwhile, in the case of Kuala Krai, they described the struggles that people had gone through during the flood to save their lives, and secure food and clean water, especially for the children. The struggles continued in the aftermath of the flood when they had to deal with the destruction of the entire *kampung*, a situation that had happened suddenly and abruptly. Hence, these experiences were imagined as comparable to those of the tsunami.

#### 6.1.2 Indigenous or traditional environmental knowledge on flood and architecture

Traditional environmental knowledge is a complex process as it combines knowledge of practice and belief that is adjusted and adapted according to current conditions. It is dynamic and continuously changing while still preserving cultural identity. Moreover, traditional environmental knowledge informs the local wisdom gained from direct experiences developed through years of 'trial and error'. This is done through observations, understanding and making sense of the ever-changing environment. Although local responses remain a prominent aspect (sometimes more grounded) in major flood scenarios, due to extensive affected areas and the long duration of the floods, external assistance from the government and other organisations is necessary.

Throughout the fieldwork, it was discovered that there is a wealth of undocumented local environmental knowledge or indigenous knowledge on flooding and flood response. The fieldwork reveals that it is apparent that local residents were used to observing, understanding and making sense of their climate and surrounding environmental or surround changes through their experiences. Therefore, they had particular references or even a 'hunch' that enabled them to predict imminent flooding. Though not always accurately predicted, close monitoring of water levels helped them to indicate their safety levels. For

example, when the water had reached a certain height within a period of time and the speed of the current that was unusual, it was a sign for them to move out from their houses to a safer place. This was often accompanied by the decision to bring their valuables and important belongings with them.

Nonetheless, though they were aware of the risks, some respondents preferred to stay in their houses during the flood, concerned about their belongings and possible break-ins. In addition, the word of mouth accounts from people who lived nearby at other places where the flood usually hit first, commonly influenced their decision-making. The information received that flooding had occurred nearby was understood as a sign and regarded as anecdotal evidence that there was a possibility of flooding and thus, helped them to be prepared. These flooding experiences had increased the respondents' awareness, and they knew the contingencies - such as places that they had to go to in the event of another major scale flood.

Equally important, the study found that the respondents were knowledgeable about their surrounding environment and as a result had responded well in adapting to local flooding. This is also reflected in the narratives of their self-built houses that were constructed with the help of other skilled residents within the community. The memories and shared experiences of settlement in their *kampung* were not just based on particular lifestyle, or personal and financial needs, but were interconnected with the culture and tropical weather conditions.

A number of respondents from both Kota Tinggi and Kuala Krai case studies believed that the flood disaster was a result of Allah's (God) wrath due to humans' wrongdoing towards nature or other creations. On the other hand, these calamities were thought to be a form of test to the believers in order for them to strengthen their faith. These personal responses were expected, due to their religious background as most of the Quranic verse emphasizes on the human's responsibility to take care of and properly utilize the natural resources given to them in this world. In contrast, the indigenous knowledge is often associated with superstitions. One of the respondents in Kota Tinggi informed about a loud explosive sound coming from the headwater or river source as a sign of a flooding event about to happen. This peculiar occurrence was said to be heard by many and continue to be discussed among both the young and older generations (refer section 4.4.2). Some believed that the

Chapter 6  
Temporary Homes in Transit Time

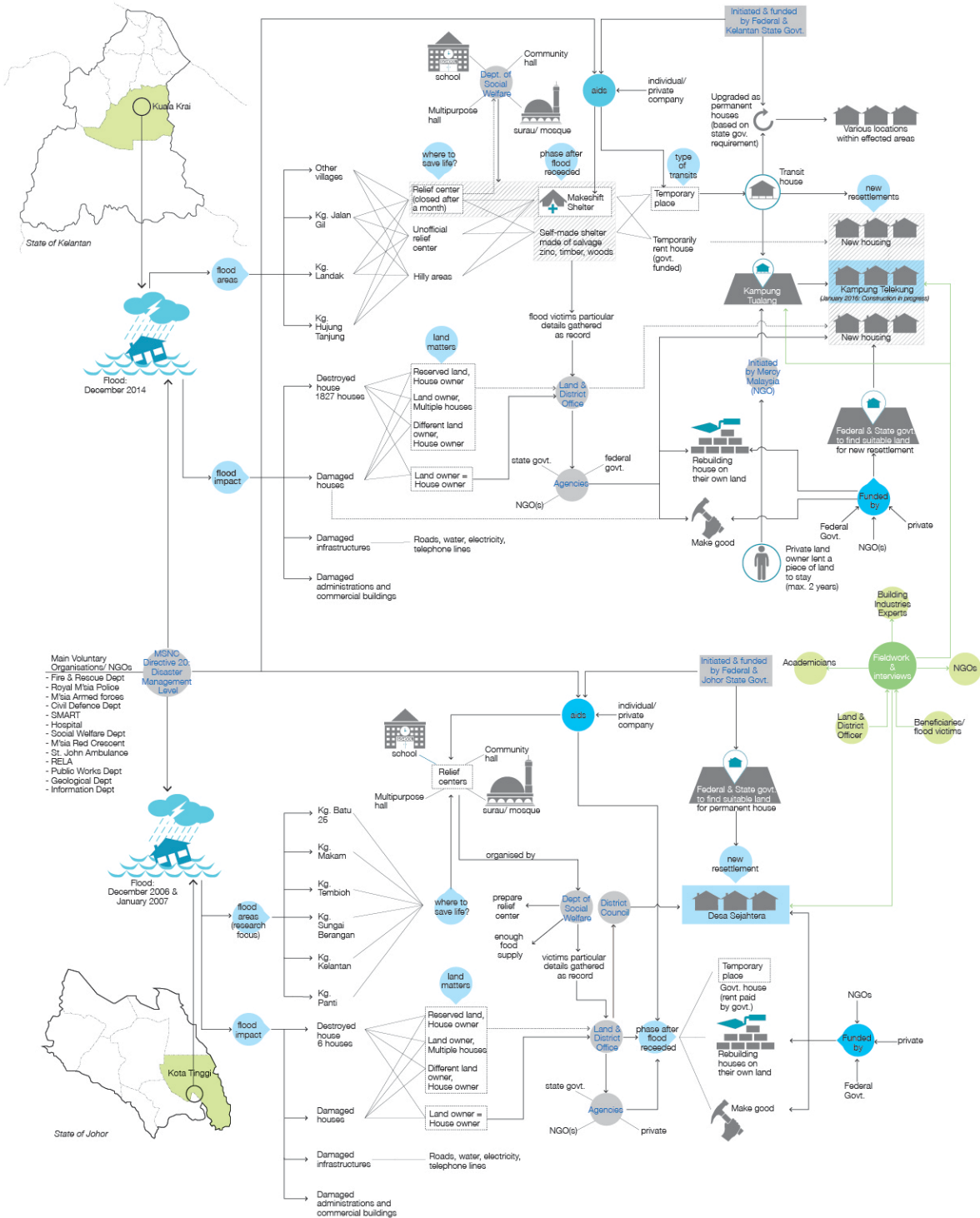


Figure 6.1 Post-flood disaster diagrammatic mapping developed for Kota Tinggi and Kuala Krai. Refer to Appendix 6 for larger scale format.

mysterious sound came from the nature itself, but others believed that it came from cannon shots from somewhere near the mountains. Nonetheless, the source of the sounds is still unknown as no one knew why or where these explosions came from. Yet, this superstitious belief is still regarded as a significant forewarning to people within Kota Tinggi to prepare themselves for the arrival of floods.

With the inherited local environmental knowledge of the flooding, people were able to anticipate and translate their understanding into valuable local architecture skills. One of the most identifiable architectural adaptations in response to the local weather and flood is the way houses were built on stilts, similar to past traditional Malay houses in Malaysia. Apart from responding to the local climatic conditions, this was to withstand certain levels of flood impact that were usually based upon the previous major flood water level and its intensity. Furthermore, the elevated houses were designed to give more privacy to the owner and to allow natural ventilation. In the past and during flood, house owners usually stayed and removed their goods to 'Rumah Ibu' until the flood receded. 'Rumah Ibu' is the main portion of the house that is usually built larger and higher than other sections of the house. However, this kind of traditional design approach is less implemented nowadays as modern brick houses were mostly built directly on the ground for cheaper construction costs.

Many people had been living in communities that had adapted with the climate and adjusted to environmental change over time demonstrating resilience. Without access to advanced scientific information, people who lived in flood plain or vulnerable areas were still able to estimate the arrival of the floods. This was done through observations, intuitions or 'interpretation' of their surrounding environment and hearsay from other people living in neighbouring places - even though the scale of flooding remained uncertain. Flood preparedness was planned accordingly using their indigenous and tacit knowledge passed down from generation to generation.

### 6.1.3 Mapping the comparison between Kota Tinggi and Kuala Krai case studies

The study outlines the chronology of floods and the aftermath response and recovery, through visual representations. Here, mapping is identified as an important tool in the initial phase of the research. It also allowed for continuous development as information was gathered and

analysed throughout the fieldwork. The diagrammatic mapping (Figure 6.1) developed in this study initially seeks to necessitate a further understanding of the complexities that were associated with post-disaster recovery and response between the two case studies. It identifies displacements and relocations activity patterns, which occurred immediately after the flood and during the temporary placements.

The mapping emphasises the key stakeholders and local residents positions and involvements over the transit period. Though the overall flow of both post-disaster processes may look similar, the map shows different networks involved throughout the transit time, before the communities were relocated to a new resettlement permanently. It also exposes any situations that overlapped, reflected and interconnected between each other during the process. Therefore, the diagrammatic representation highlights any subject that had gone unnoticed or overlooked in the course of actions.

Reviewing both case studies through the diagrammatical mapping highlights that the post-flood disaster in Kuala Krai was more complex than Kota Tinggi, due to the increased capacity of large groups of key stakeholders, local and external agencies at different phases, which also involves both the federal and state governments. The study posits that the increased number of parties involved suggests a parallel indication of the level of awareness and sensitivity of flood issues and their implications within Malaysia. Nevertheless, the distribution of relief and aid in the 2014 flood disaster of Kuala Krai was reported as less manageable due to its unprecedented scale, in contrast to the 2006 and 2007 flood disaster in Kota Tinggi that was more centralized and organised.



### 6.1.4 Timeframe: the comparison

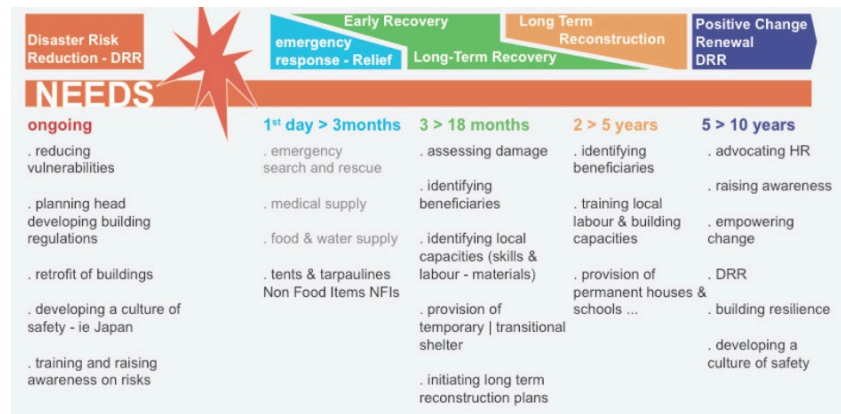


Figure 6.2 The disaster timeline shows different stages of disaster response that are interconnected (Source: Architecture Sans Frontier).

The disaster timeline (Figure 6.2) shows the different stages of a disaster response that are interconnected to each other - between emergency response, long-term recovery, and long-term development in general. This timeline suggests that the assessment and evaluations of flood damage takes place from the beginning of post-disaster before the designing phase of any possible disaster response.

This study further establishes the chronologies of flood events in Malaysia illustrating the pattern of recovery and response for both case studies (Figure 6.3). Similar to a general disaster recovery timeline presented in Figure 3, these timelines demonstrate the interconnected and overlapping activities that could be made more effective in future disasters. In addition, the timelines display a significant variance to the timeframe of the transit period, which demonstrates that the transit phase is unique to a particular context and also flexible as it can be either 'shortened' or 'prolonged'.

For instance, in the case of the 2006/2007 floods in Kota Tinggi, it took 5 years to go through the whole rebuilding and redevelopment process, from the start of the relocation process to the new resettlement at Desa Sejahtera in 2012. Meanwhile, the community in Kuala Krai took a shorter time of 2 years to achieve the final phase of recovery, for the relocation of flood-affected people such as in PMT, to their new permanent houses in the new permanent resettlements such as Kampung Telekung.

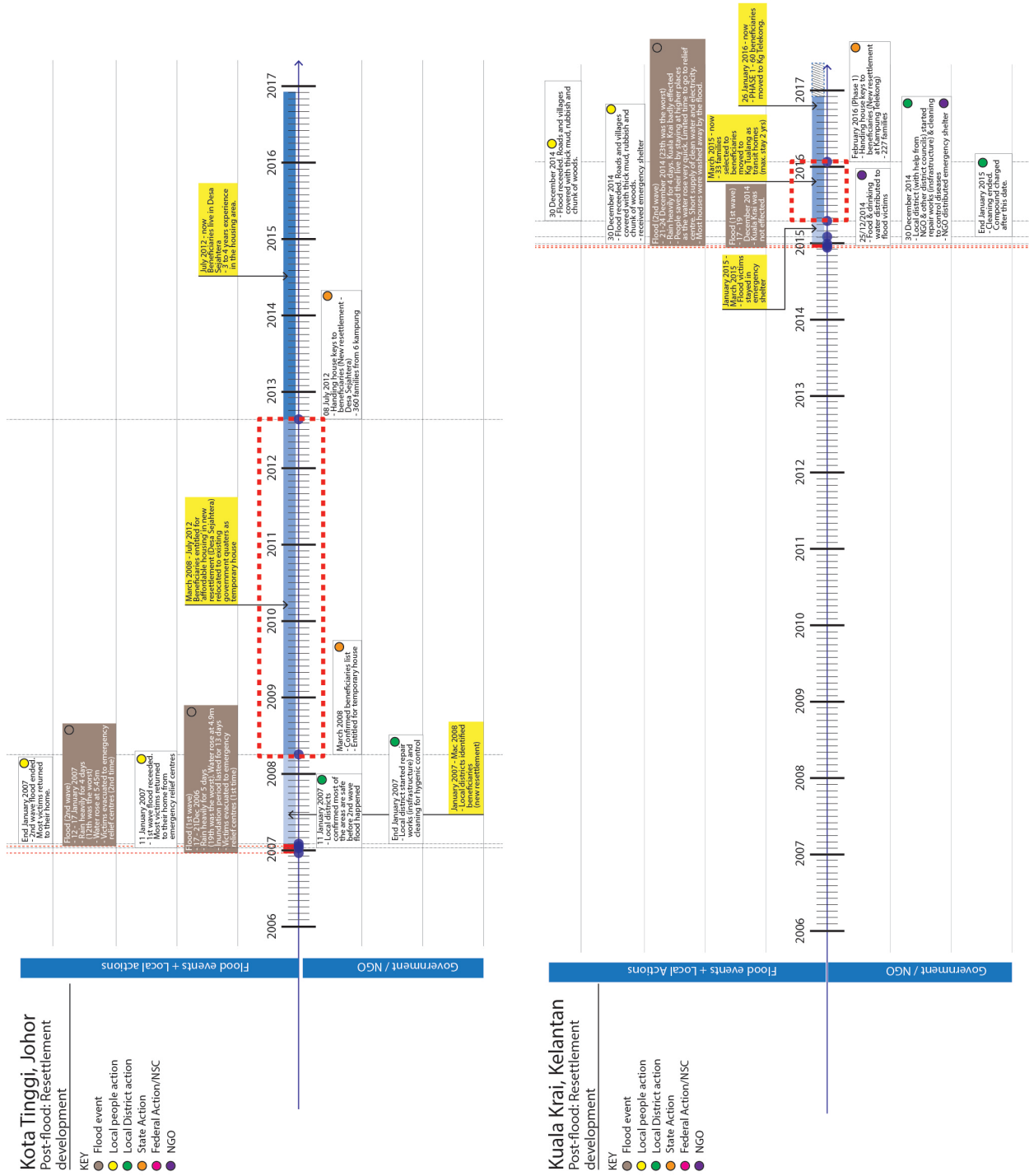


Figure 6.3 highlights the significant variance to the transit period (shown in red dotted boxes) that is usually shorten or prolonged. Refer to Appendix 7 for larger scale format

The first phase of permanent housing in Kampung Telekung consists of 60 unit houses and keys were handed over to new residents on the 26<sup>th</sup> January 2016. The new permanent houses, part of the resettlement programme, took only 6 months to build after the ground leveling was completed at the site in July 2015. The houses are built on individual lot sites, each covering an area of 869 sqft. The houses are fully furnished and consist of 3 bedrooms, 2 toilets, a living area, and kitchen. The urgent timeframe had influenced many of the decisions made in the design of this resettlement project. An important part of these decisions was for the design - the process and the construction techniques, to be completed as fast and efficiently as possible so that people could move in from their temporary shelters. In addition, the houses had to be constructed within a certain budget allocated by the government.

The timeline developed in this study also revolves around the issue and the question of ‘what has influenced the length of transit time?’ Here, the study identified six forces that had influenced the variability of the transit time (figure 6.4) such as the scale of the disaster to determine the damages and losses, social complexities including identifying beneficiaries, decision on displacement and relocation program for the beneficiaries, and land issues in relation to land tenure. In addition to the above, it is in parallel with searching for funding or donations to support the next level of recovery, which is the post-disaster long-term development either in building reconstruction or house relocation that will take at least 8 months to complete.

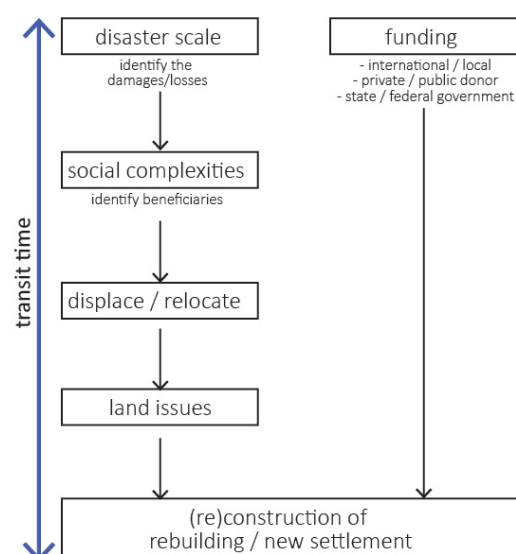


Figure 6.4 Six forces that influence the variability of transit time after flood disaster.

### 6.1.5 Dwelling in the temporary: Transition Period

Since the timeframe for post-flood recovery is lengthy, there is a time gap that needs to be bridged over. In reference to the fieldwork conducted in Kota Tinggi, the findings identified that the transition period is vitally important for architectural development, and the outcome of long-term resettlements, especially in situations of permanent relocation.

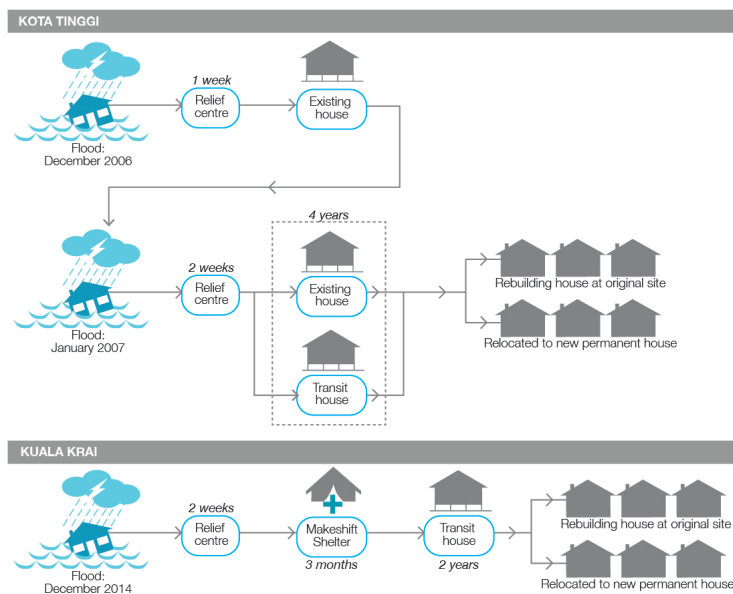


Figure 6.5 Process of displacement and relocation that the communities in Kota Tinggi and Kuala Krai have gone through.



Figure 6.6 Picture shows the situation people (from PMT) been through during transit. The house highlighted in red was the original dwelling, which could not be occupied anymore due to damage. After coming back from the relief centre, the residents were provided with temporary shelter highlighted in yellow (funded by various agencies). They were then relocated to a transit house (highlighted in blue) after 3 months living in the shelter.

Therefore, the 2014 flood that happened during the first fieldwork gives an opportunity to experience and observe first-hand the recovery and the 'trial' period of transit time.

The respondents' narratives from both case studies and observations reveal that the affected communities had gone through several displacements and relocations throughout their transit period (Figure 6.5 & 6.6). In the situation where the communities in Kota Tinggi and in Kuala Krai were relocated to a permanent resettlement, the study observed two different approaches of transit home adopted during the transit period.

In the case of Kota Tinggi, most of the residents were allowed to return back to their existing houses after the disaster. Meanwhile, some of them, whose houses were badly affected, were relocated to the existing government owned JKR houses that were available within the town. Locating them at these premises for at least 5 years gave an advantage to the government due to budgetary reasons, however, apart from receiving less psychological support, the respondents reported that they had little participation and involvement in the development of the new settlements during their transit period. The community was omitted in most, if not all, decisions that were supposed to be for their future undertaking. As a result, they felt devalued as end-users and were forced to cope with any undesired design consequences of the new resettlement. This is similar to the worldwide situations mentioned in Chapter Two.

In Kuala Krai, thirty-three families were selected to inhabit the PMT since their houses were badly affected or destroyed. In PMT, respondents claimed that although they had lost all their assets, staying close to others from previous *kampung* became a motivation for them to stay strong and to persevere through this hardship, as they had experienced the same scenarios together. Throughout their stay in PMT, they received moral support from Mercy including motivational and spiritual assistance. In addition, the residents were given the knowledge of how to respond to flood scenarios in the future through workshops and 'Flood Simulations'; where they rehearsed the procedure that needs to be taken during flooding. Unfortunately, the study learned that none of the support, actions and input provided was related to the crucial development of the permanent resettlement in which these families would soon be the 'end-users'.

In consideration of both cases, the study discovers that both flood-affected communities were 'stranded' - living in their temporary home during the transition for years. Thus, the thesis proposes that the process of understanding and acquiring opinions from communities to find solutions for future resettlement outcomes should be made possible throughout the transit time. At present, the temporary shelters and homes provided are as a result of the typical *modus operandi* of a flood disaster response, which is literally to provide basic life necessities and temporary protection from bad weather or danger. However, the study suggests a possibility to make use and exploit the transition period in order to collectively understand, assess, experiment and receive feedback from communities on their requirements, either culturally or practically.

#### 6.1.6 Displaced and relocated

The findings of the study reveal that local residents in both case studies have adapted their way of life within their environment especially to the flood situation over time. This includes the way they have built their houses, which was also influenced by the availability of new materials and contemporary construction systems at that time - by building themselves or hiring small-time contractors. Nevertheless, respondents in Kota Tinggi reported that there were a number of residents who had decided to return to their flood-affected *kampung*. In Kuala Krai, two respondents had expressed an interest to find houses for resettlement near to Kuala Krai town, rather than move to the new settlement that they had been assigned to. This raises the question of what makes people want to return to their original settlement? What influences them to wish to resettle as close as possible to their original town?

The research identified three key issues of unwanted relocation from both case studies. Firstly, the local residents had strong place attachments to their existing locality, which is not just to do with the setting and condition of *kampung*, but about close relationships with neighbours and friends. They had lived in their original settlement for a long period of time over many generations, where they had developed a sense of belonging and trust among each other. Consequently, the values that existed within their community led to a 'set pattern of life' that goes along with their local traditions and culture, and belief practices that make them reluctant to be relocated.

Secondly, the new settlements are located far from their existing settlement and livelihoods, particularly in relation to employment. Respondents in Kota Tinggi informed that the relocation to the 'outskirts' of the town had caused difficulties with distance to reach the public transportation such as bus and taxi that had affected their transport to schools, market and job opportunities. Meanwhile, the respondents in Kuala Krai had anticipated experiencing the same issue if they decided to move into the new government-post-flood housing development.

Thirdly, the displacement or relocation required the flood victims to re-adapt and re-adjust to their socio-economy and socio-cultural needs as well as trying to adapt to their new environment that was in contrast to the *kampung* setting. This study suggests that understanding the users and their needs by providing appropriate infrastructure, ideal planning and collectively accepted programmes might help the success of the relocation programme.

#### 6.1.7 Preferences and/or necessity OR Needs vs. Desire

The relocation program in Desa Sejahtera, Kota Tinggi demonstrated the outcome of a housing development by the providers (state government, donors and architects) based on the 'assumption' of 'what people need', rather than being locally responsive. This relocation program has not taken into account the requirements of the relocated community, who are the future residents. This resonates with the other resettlement projects worldwide that are provided for the 'underprivileged segments of the society', often associated with low-cost construction, and swiftly built (Silva, 2011). This is the usual response to an impending crisis of housing with the aims to achieve efficiency in terms of limited resources of land, infrastructure, and finances. Therefore, resettlement inclines to be 'centrally regulated' or a 'top-down' approach, and consequently renders the affected communities as powerless and non-participative recipients of relief (Silva, 2011).

Although the resettlement and construction process of Kampung Telekung (Kuala Krai) and Desa Sejahtera (Kota Tinggi) was different, it displayed a similar 'practice', that is, both are dominantly coordinated and managed by a provider. The study presents a comparison of the construction process made for post-disaster resettlement in both Desa Sejahtera and Kampung Telekung. It describes the different approaches to completion of the resettlement projects – between the construction methods in Desa Sejahtera and Kampung Telekung. In Desa Sejahtera, a

typical in-situ construction method using post and beam, and brick walls was implemented. Meanwhile, the Kampung Telekung project in Kuala Krai had adopted the prefabrication construction system using precast concrete, through the use of BIM. Although BIM enables architects and built environment professionals to engage with projects prior to their construction, they did not obtain any input directly from future residents, for the project of Kampung Telekung. Using the Building Information Modelling (BIM) approach, the architect and his team were appointed by the contractor to replace the initial design team of the project in order to provide coherent project management and design efficiency. The aim of the project was to provide efficient spatial arrangement and maximize the internal spaces within its given perimeter and at the same time to minimize the construction timeframe with specific allocated cost. This was to allow the flood-affected families to move in to the allocated permanent house as soon as possible. Throughout the design process there was no input obtained from future residents from either conducting a participatory approach or even a survey of their needs.

## **6.2 Negotiating the role of architects in transit time**

In this study, it was identified that the complexity of post-disaster recovery and responses relates to architecture in many ways. A disaster has consequences on the physical environment especially planning and housing, infrastructure and shelter. This inevitably relates to the architects role and their responsibility in design and execution of the post-disaster projects. Here, architecture is seen as a medium that reconnects both physical and social structures lost during the disaster. This can be done by working closely with the people and understanding the on-ground reality, especially during the transit time. The crucial question to ask is where architects should and could participate within the resettlement process? This section assesses the narratives gathered from the architects who participated in the workshop and interviews conducted for this study (in Section 5.7).

### **6.2.1 Architects' relevance in post-flood recovery and response**

It was commented that architects were at the bottom of the structure/hierarchy of the disaster response (section 5.7.1). This is mostly due to the fact that architects were often the last people required in disaster reconstruction. Hence, this provokes an interesting argument about the role of architects in coping with architectural production in a



post-disaster context, as well as their relevance and the appropriateness of their knowledge and expertise. Correspondingly, conventional architectural practice does not tend to be aware of the necessities of humanitarian actions related to post-disaster recovery and response, particularly in flood events. Architectural students as well as architects themselves often place emphasis on the objects of architecture rather than the people and processes related to architecture. Thus, this study challenges architects to move beyond their traditional design and construction practice and actively engage with their potential role as facilitators of re-building processes. Most importantly in terms of architectural practice is to prioritize the needs and desires of vulnerable communities in places of uncertainty and rapid change.

Architecture plays a large role in post-disaster recovery, as there are extensive demands for physical reconstruction in the aftermath of a disaster. As a result, post-disaster recovery stresses the requirement for spatial practices such as architecture and urban design to have significant effects in the reshaping of public and private spaces affected by disaster. This again discusses the critical role of architects in reshaping the fabric of a particular place such as in Kuala Krai.

In negotiating the issues with architects (refer to section 5.7), it was highlighted that the role of architects in flood disaster recovery does not only focus on rebuilding damaged settlements and the reconstruction of lost physical properties, but also helps restore the livelihood of the affected community in terms of intangible and spiritual sense. Architects were considered problem solvers, however the respondents commented that not all of the issues could be solved through architecture alone. Hence, it was suggested that one of the architectural approaches to post-disaster solutions is using a particular 'system' that provides for appropriate spaces, programmes or contents of disaster recovery. Properly designed architectural spaces offer the means for recovery activities to emerge in order to address the emotional and spiritual aspects which physical architectural solutions alone could not accomplish.

#### 6.2.2 Users as subject rather than object.

Many architects claimed that building for post-disaster was not the same as normal building. The study identified that post-disaster reconstruction is both time and context specific. Apart from rebuilding the physical assets of a place, post-disaster reconstruction involved rebuilding the social structure of the affected community itself, within a pressing

time. Moreover, rebuilding also needed to be sensitive to cultural and religious aspects.

It was recognised that the qualities and the essence of the locals are still embodied in the affected community, although their physical properties, such as buildings had been destroyed. The communities hold dear their identity and the sense of society within their neighbourhoods. Meanwhile, attachments to the physical place and remnants of it remain ingrained within their memories. Both identity and memory becomes part of who they are, instilled in their sense of community. As a result of this, the study has demonstrated that the local communities remained optimistic, continuing to work and help each other. The fieldwork confirms that the cultural tendency of Malay communities adheres to the concept of *gotong-royong* (mutual-help). Whilst this proves that affected communities, their capacities and resources have plenty to offer, they are frequently undervalued. Architects have the responsibility to acknowledge them in the design process, which could result in more comprehensive and successful disaster responses.

### 6.2.3 Community engagement/participation

The study has documented the rich body of literature on the importance and role of community participation in post-disaster recovery and reconstruction (Chapter Two). It highlighted that the occupancy rates for post-disaster resettlement are higher when communities were involved in all aspects of decision, planning, design and management of the development reconstruction. This instills the beneficiaries' sense of ownership and satisfaction for their new homes. Though the architects acknowledged these issues during the workshop and interviews (section 5.7), dialogues with the locals conducted in Kota Tinggi (Section 4.5) revealed that during the recovery and reconstruction process, this bottom-up approach was non-existent.

The recent flood disaster in Kuala Krai demonstrates the potential of community involvement in disaster preparedness and risk reduction activities such as the flood simulation for future disasters. The study discovered that there was some community participation during the construction of transit shelter in PMT, in which MERCY invited local skilled workers and residents to get involved. However, the study reveals that community participation in the development of post-disaster permanent resettlement remained absent and insignificant. This was due to the 'top-down' or 'donor-driven' approach often used for long-term development

of permanent settlement. The funders recognised this approach as quick and most effective, hence the development is entirely managed by the government agencies or private funding from inception to the completion phase. In addition, some communities' previous land tenure status as residents renting and living on government-reserved lands had portrayed them as passive, desperate or helpless beneficiaries of relief. As a result, it had restricted their opportunity to convey their requirement and needs, and instead they had to accept the decisions of donors or funders.

Arguably, it was not easy to keep the current or future beneficiaries satisfied in this situation. Nonetheless, the study acknowledges the long-term benefit of community participation as well as the need for these issues to be addressed within the reconstruction practices highlighted in both case studies. Hence the study suggests that implementation of community engagement should begin from the 'short-term' phase of post-disaster recovery during the transit time. The provision of transitional shelter should be considered as part of the resettlement design process to allow adequate time to build community trust, participations and empowerment. At this particular phase, the list of beneficiaries for future residents of the new resettlement should have been prepared for, as the engagement will be focused towards these selective participants.

Prior to relocation, respondents in Desa Sejahtera (section 4.4.3c) narrated that they were not given the opportunity to be able to contribute their thoughts and requirements, either in terms of spatial planning or architectural decision-making.

Though the resettlement process may take longer, this provides adequate time for architects to analyse critical issues related to specific community culture, their needs and to establish appropriate community engagement. Moreover, the study suggests that temporary residency at transitional shelters during the transit time could become a pilot test or field study. This would allow for developing understanding of the situation and acquiring community feedback on planning and design, identifying unique characteristics of future settlements as well as experimenting with both modes of living or architectural typologies. This would allow architects and designers a point of reference to plan and implement proper permanent housing design and reconstruction - especially resettlement.

#### 6.2.4 The patterns of settings and activities

Apart from the importance and advantages of community engagement as part of space reproduction in the aftermath of disaster, here I focus on the purpose of studying the patterns of settings and activities. The purpose of design was described as creating an environment that reflects the user and their requirements and is, in short, user-oriented. It also has to respond to the culture and is based on the understanding of how people and the environment interact.

Culture is described as creating behavioural norms, thus understanding the cultural context of the affected communities permits one to anticipate the actions of those people. The identity of the community defines how they behave and how their built environment is crafted and expressed. Therefore, understanding the culture of people such as in Kuala Krai is to interpret the 'meaning' significant to these affected communities. Here, the relationship between built environment and behavior is potent, especially during the transit time when the analysis in the behavior of the affected people is being conducted. It is understood that the behavior of the people in Kuala Krai or Kota Tinggi is actively and constantly interacting with their built environment. This relationship demonstrates that observing the transit time could substantiate the setting and pattern in the culture of the affected communities.

Moreover, there is a need to understand the culture of the affected community in relation to their built environment. Culture maintains the identity of a group, acting as a mechanism that conveys the intelligence in behavior and how they perceive and create artefacts. Eventually, culture is expressed as a framework that defines 'meaning' towards this particular group, hence culture emphasises the significance of their architecture and surroundings. In relation to the affected communities, their cultural inclination remains embodied in their belief and actions. It is therefore imperative to translate these cultural elements into the new resettlement.

The *kampung*, commonly associated with Malay settlements, were traditionally established near the river, beach and along the main roads. Usually, the characteristic and form of the *kampung* house was carefully designed and corresponded to its function, cultural environment, climate, and local behaviour. Hence, the form of the house was generated according to its functions. Furthermore, the concept of

fenceless compound adds to the unique characteristics, indirectly shaping the *kampung* organization and settings. In a way, the aspect of design and planning and adaptability of *kampung* people reflects the culture, thus the *kampung* people in general and the Malay people specifically, are a reflection of the design, the planning and adaptability. Therefore, studying the patterns of settings and activities will contribute in producing user-oriented resettlement.

The relationship between the culture and built environment is hardly understood until we understand the house, activity, social patterns and the environment as a holistic system of settings. Realising this may not be possible in the situation of post-disaster since most of the *kampung* physical characteristics had been washed away. The temporary home in the recovery phase is seen to act as an alternative platform to acquire input from people or as a platform to experiment in post-disaster living. This provides an opportunity to understand their activities, their needs and cultural properties. These are important elements to interpret and develop into the new settlement. Often in post-disaster cases such as in Kuala Krai, these properties have to be redeveloped, reshaped and relearnt by the communities. For the study, the information derived from the observations in the transit time as well as the input from previous resettlement programs is of great importance to disaster studies.

In the case of Kota Tinggi, respondents highlighted the importance of social interaction and activities that occupied their daily lives. They also revealed how their connection with the natural land is important, as they were used to growing vegetables in the allotments and planting local fruit trees. Though the respondents in Kuala Krai had yet to move into their new resettlement housing, they had demonstrated how they had personally modified their temporary space and time in PMT through their memories and recollection of their past.

The example of the relocation programme in Korea shared by Hafiz demonstrated the consideration of several important factors to develop basic necessary infrastructure, mainly the community activities, demography and health. It was described that the space provided was not limited to indoor buildings but included outdoor spaces, imperative for people to continue their daily activities. The affected community in Kuala Krai is a testament to this, where the community relies on outdoor spaces as part of their social and private extension of the house. Although it could be argued that the size of temporary shelter in PMT was relatively small, it could also suggest that their attitude with outdoor spaces and usage is

effective. The study argues that the relationship provides useful insights into determining the plot sizes and neighborhood planning between landscapes and built form.

#### 6.2.5 Adopting local approaches to disaster responses

The study justifies that adopting local approaches to disaster responses may preserve indigenous knowledge and strengthen social capital. Furthermore, it makes the reconstruction more acceptable, relevant and appropriate to the community in terms of economy, technology, culture and climate. Looking back at the permanent housing in Kampung Telekung (section 5.5.3) through observation and conversation with the 'designer' demonstrates the example of 'donor-driven approach' that utilises modern technology, particularly in the use of materials that are uncommon to the community. The use of composite panels to construct the walls of houses has advantages such as fast construction, cost effectiveness and space saving. However, it was anticipated that it might limit the flexibility of space for communities to adapt, as it was common for houses to be renovated by their occupants. Furthermore, it may also be difficult for the local contractor to deal with future extensions, as the panel is ready made, and as a result of inadequate local experience in unusual building techniques.

The study suggests that reconstruction and resettlement should respond to cultural differences and a dynamic timeline. Therefore, the process should establish what building materials are locally available and should work alongside local craftsmen and builders. Apart from that, they should not neglect the diverse personal needs of dwellers and the desires for individual identity. It is important to appreciate the resiliency and resourcefulness in the displaced and not get trapped in the usual portrayal of the displaced as helpless and passive flood victims.

#### 6.2.6 Lessons not learnt

Apparently, the question of what needs to be done, from the architect's point of view, is relevant in post-disaster situation and it is especially significant in transit time. However, there are still issues that have not been explored. In Section 5.7, the architects highlighted the niche areas within post-disaster response that could potentially interest architects, but until now less action has been taken. This is an emerging and topical issue that needs to be addressed.

This is also being highlighted at global level as the NGO such as The New Global Alliance on Urban Crisis is attempting to bring together major actors such as architects to start working with local communities in humanitarian responses. It is also notable that the Alliance has recommended a general timeline and procedure in dealing with post-disaster situation. Yet, the question is how is it implemented at national level that emphasises local people's involvement in the decision-making.

The complexity and challenges in dealing with different types of settlement that are unique and could not be generalised is what most international players were not prepared for. Therefore, the temporary home in this transitional time is seen as a useful period in gradually building trust and developing fruitful communications between the locals and the players or built-environment professional (as humanitarian actors). This reflects the importance of facilitating the affected communities according to their locality that requires context-specific approaches in order to address the disaster response from the earliest stage of post-disaster recovery.

This reflection can be seen through the conversation with the architect and BIM expert on his involvement in designing Kampung Telekung. His involvement in the design of the individual houses, which was strictly developed based on the cost and materials requirement rather than the cultural needs and tendencies of future residents. Hence, the action resulted in no physical or emotional engagement with the end-users. This suggests that the architect had only a small role at the end of the recovery process. Nevertheless, the architect could also play a more important role in developing and understanding the needs and desires of future users by providing the platform for them to shape their own environment. The study agrees with the statement that architects should change from being an 'interpretive agent' to a 'transformative agent' affecting local livelihoods (Boano and García, 2011). The resettlement housing in Kota Tinggi, was directed by SPNB, a government driven agency that is responsible for developing housing for the poor in Malaysia.

#### 6.2.7 Design archive

The study stresses the importance of a comprehensive and accessible 'data bank' that documents architectural related post-disaster recovery and reconstruction for future reference. It could be either in the form of drawings, images or texts that explain various approaches or case examples of post-disaster scenes. Although there is literature on the

challenges of post-disaster recovery and reconstruction, proper documentation in analyzing the impact of post-disaster reconstructions - especially permanent resettlement - is imperative yet lacking in the Malaysian context. It would be important to gather appropriate feedback on disaster responses and help identify any possible improvisations required over time, as well as to establish guidelines on post-disaster housing provisions. Nonetheless, the study emphasises the necessity for analytical documentation rather than merely 'recording.'

Although states such as Johor and Kelantan are prone to annual flooding, there remains a lack of local official references or guidelines related to risks of flooding to housing. In addition, the study has revealed that there is also a lack of references on post-disaster housing provisions and impact of resettlement after the flood within Malaysia - culturally and economically. The case study of Desa Sejahtera in Kota Tinggi is an example of a flood disaster relocation programme that was undocumented or re-evaluated even after its occupation. When actions were taken without subsequent follow-up on the impact of relocation, issues pertaining to flood disaster response and relocation could repeat. Thus, when the Kuala Krai flood occurred in 2014, the post-disaster recovery actions in regards to the reconstruction and resettlement was delayed due to absence of specific guidelines for permanent post-disaster housing. The situation worsens as disaster response agencies rarely return to places in which they have operated to re-examine the impact of their relief. It could be argued that there is little attention given to long-term recovery, hence the study advocates the transit time or the transit home as a pivotal phase in the current as well as long-term disaster response.

### **6.3 Conclusion**

Chapter 6 demonstrates transit time after the post-flood disaster as an important phase of recovery in redeveloping the institution of an affected community. Both the case studies and negotiation with architects displayed different points of views in relation to post-disaster recovery issues. The case studies revealed issues gathered from the narration of people who had experienced and shared their perspectives on the real situation of disaster. Meanwhile discussions with architects addressed the potential of an active approach in facing the current and real challenges on the ground.



The study acknowledged that architects play a significant role in post-disaster recovery, while architecture becomes a tool to reconnect both the physical and social structures lost during a disaster. Hence, the study highlighted the architect's contribution in response to the relationship between the institution formation and the situation on the ground (or place making). To achieve an optimal post-disaster response and recovery, the solutions are twofold. One is the way architects respond to local culture, identity and religious aspects and secondly is to respond to the community physical needs and situation that is time and context specific. In this particular situation, the architect's contribution should not be treated as a one-off. However, the study suggested that architects play a vital role entirely throughout the post-flood disaster recovery stages; from short-term until the long-term recovery actions. Apart from providing responsible design solutions for new resettlement, architects have the duty to engage and participate with the affected community during their transition period of post-disaster recovery. The study finds this as an essential undertaking, to facilitate affected community during the re-building process as a means to rebuild their physical dwelling and community as well as their livelihood.

The study draws attention to narrative methodology in both the scientific and personal as an important approach in understanding the situation thoroughly. Through narrative, the information gathered is not about the subject per se, but it demonstrates the interconnection with other elements or aspects - practically or emotionally, culturally and environmentally, that play a part in rebuilding the post-disaster affected community through architecture such as the development of permanent resettlement. Indigenous knowledge discussed in this study is regarded as an important element in managing and dealing with the disaster among the locals. However, indigenous knowledge is often contextualised towards a particular community through stories and verbal communications passed down from previous generations. Although these knowledges were and are not scientifically proven, the community accepts them as part of the wisdom from their forefathers and at times are seen to be depicted as common sense. Nevertheless, the study highlighted that the indigenous knowledge is different from the knowledge used by the local architects, as both refers to a different set of values and information. However, both are significantly important in this dynamic and ever-changing flood disaster situation.

Architects use their architectural knowledge to connect potential spaces or sites to the design requirements and making references to valid

documents or official written information available. Site visits and analysis are conducted but rarely involving interviews or participations among the locals or flood-affected communities. Meanwhile, the local community utilize their indigenous knowledge derived from lived experiences and collective memories of past observations, commonly as an initial response to the flood disaster. As the indigenous knowledge is rooted in the social context of these communities, architects could only extract them from personal narratives, as these knowledges are undocumented and orally transmitted. Hence, transit period remains relevant in this post-disaster recovery situation; to gather and explore such knowledge required, especially in the preparation of long-term recovery in rebuilding permanent post-flood resettlements.

The 'stay-in-transit' necessitates an assessment of 'what is to be done next?' The study suggests making use of the transition period as a two-way experiential learning platform for both the architects and affected community to take advantage and benefit from each other. At this stage, the study indicates that the architects potentially be able to observe, gather collective understanding on the situation on ground, evaluate, discuss and receive feedback from the flood-affected residents on their needs and requirements. Eventually an architect has to reflect on the design developments of post-disaster recovery such as to accommodate for the design of new resettlements. During their transition period, the architects will recognize the dynamic involvement or participation of all stakeholders especially those affected communities, as well as acknowledging and empowering local skills in rebuilding their permanent resettlement. This may result in less dissatisfaction with the architectural outcomes later. These measures could gradually rebuild their sense of ownership and belonging by making them part of the process. However, it is necessary to obtain support and cooperation from the built environment professionals, especially the architects. In some instances, the transitional period becomes a testing ground for new forms of design outcomes to be experimented and explored. The transit home in transit time may be a useful platform for the affected community to adapt to a new situation and environment, as well as reflecting and informing their needs and necessities towards a different standpoint – a call that could deviate away from the typical solution of a terraced house design typology, such as in *Desa Sejahtera*.

Apart from that, the study emphasizes the necessity of reviewing the situation from an architectural point of view, as it argues that architects play a vital role in these critical circumstances that should begin

immediately during the transition period. The study discloses that traditional environmental knowledge that combines the understanding of practice and belief gained from direct experiences has equipped the respondents in facing the flood situation and its aftermath for generations. This invaluable tacit knowledge is substantial, as it has influenced place making, lifestyle within the neighbourhood, and the culture and environment of a *kampung*. Understanding and adopting local approaches in response to post-disaster architecture recovery may uphold indigenous knowledge and strengthen their social institutions.



# Chapter Seven

## Conclusion

### 7.0 Introduction

The final chapter summarizes the enquiries of the study on the significance of transit time in order to develop the post-disaster relocation and settlement process. Major flood disasters are one of the key global issues faced by societies as an impact from anthropogenic climate change. It is anticipated that flood-related disasters will escalate in the future. Moreover, these events are likely to be especially harmful to those living in low-lying and flood plain areas, causing displacement and the subsequent need for either voluntary or involuntary relocation.

Within this context, the 'disaster' is not restricted to the state of distress that occurs after the sudden-onset flood event. But, on a smaller scale or everyday level, flood-affected communities are having difficulty during the phase of recovery and the process of struggling for normality. This is especially difficult when flood-affected people have to move to unfamiliar places for permanent resettlement following the aftermath of floods that is often described as unpleasant and unpredictable.

Focusing on the context of Peninsular Malaysia, the study has also highlighted the issues of resettlement from the perspectives of architectural practice. The study established that permanent resettlement designed and built with the people in mind and using local materials, skills and practices may produce more favourable outcomes. Furthermore, allowing people's engagement in the resettlement process will enable them (the beneficiaries) to be in control of their housing situation. In achieving this, the study advocates an engagement process that should take place during the 'transit time'; the period of temporary home and recovery.

This study of post-flood disaster response has been explored using a hybrid methodology, through two case studies related to major flooding in Peninsular Malaysia. The first case study was Kota Tinggi town in Johor that was affected by devastating floods that occurred 10 years ago between December 2006 and January 2007, and struck three states in Malaysia. The second case study was Kuala Krai town in Kelantan, which

was devastated as a result of an unprecedented flood event that occurred in December 2014 and severely affected the north and east coast areas of Peninsula Malaysia.

The case study of Kota Tinggi presents the relocation of 360 flood-affected families, and discusses the key issues relating to the new settlement since its occupation in 2012. This led to the research questions of how and what can be done to improve the relocation settlement? Or when should it be done and why is it important? The study was initially concerned with these questions when the unprecedented flood of December 2014 struck during the first period of my fieldwork. This gave me the opportunity to observe and experience first-hand the initial post-flood response and the stages of post-flood recovery in Kuala Krai, over a three-month period immediately after the flood event. The recovery process for Kuala Krai case study is still ongoing when this thesis is written.

Section 7.1 re-examines the research objectives in light of the findings and further describes the contribution of the study with reference to the theory and practice of post-flood disaster recovery highlighted as the 'transit home in transit time'. Subsequently, section 7.2 explains the implication of the study in regards to current architectural practice in disaster situations, and finally suggestions for future studies are laid out in section 7.3 to develop further critical post-disaster architectural research. The study offers concluding remarks in section 7.4.

## **7.1 Achievement of Objectives**

The study focused on four research objectives that responded to the key research questions. These were, (1) to understand the importance of the role of architects and architecture in post-flood disaster recovery as a consequence of climate change impact, (2) to identify the contribution of empirical work such as narratives in understanding post-disaster situations, (3) to learn from and reflect on past post-disaster relocation and resettlement processes, and (4) to explore the concept of temporary home in transition to improve the architectural aspects in post-disaster resettlement. The following subsection summarises the findings of the study.

### 7.1.1 Question 1: Why is it important to study post-disaster recovery and how can architects respond to play a part in this situation?

Humans co-exist with nature, and human experiences of weather and cultural ways of living are interrelated and have been developed and adjusted over time, in order to accommodate the experience of climate (Hulme, 2011b). The study begins by understanding the climate change and its relation to the idea of Anthropocene. The study expressed that nature and culture are intertwined with dynamic forces beyond human control. Flood is considered as an event that is part of the ongoing changing situation within the Earth system, nevertheless, the uncontrollable human activities towards nature had worsened the situation, exposing vulnerable populations to hazards, which consequently could become disasters.

The study of post-disaster recovery in reference to the role of architects was discussed and proven to be crucial. This was in response to the increasing number of disasters occurring worldwide and anticipated in the future. It was mentioned that architects were normally at the bottom of the 'list' required in post-disaster reconstruction. Nevertheless, the study learnt that architecture is a vital aspect of post-disaster response in terms of demands to accommodate and provide shelters for disaster-affected people who have been displaced. The contribution from professionals in the building industry such as architects may help these affected people to repair and reconstruct facilities and homes that have been damaged or destroyed, at the same time expanding the opportunities to make available basic resources that were previously neglected.

The study emphasized that the outcomes of permanent resettlement developed after disaster often resulted in disappointment among the users. However, there has been little evaluation observing the after-effects of permanent displacement, especially in the context of Malaysia. Hence, my interest for the study has been in understanding the gap between the timeframe of a disaster and the permanent resettlement resulting from the post-disaster recovery - in other words '**transit time**'. The study posits that the gap provides a crucial opportunity to explore the possibilities for doing things differently in both the architectural practice and for community engagement of post-flood disaster. Previously flood disaster-related stakeholders such as government agencies and NGOs tend to react by quickly reconstructing permanent shelters, however

most of the outcomes have been proven to be disconnected from the desires and habitual needs of the flood-affected communities.

Furthermore, rebuilding communities after disaster is often related to the improvement of spatial and planning practices. The intention is to have significant impact in the restructuring of public and private spaces affected by disaster and making them (both people and development) more resilient to future disaster. Therefore, the study brings to light the critical role of architects in reshaping the fabric of a particular place such as Kuala Krai.

7.1.2 Question 2: How does the empirical work (such as narratives) of this study contribute to an understanding of post-disaster situations?

The study has shown that while official scientific reports produced from institutions such as the IPCC provide rich information on environmental knowledge including flood disasters, they do not engage with people's actual experiences and circumstances. Thus, this study focuses on exploring the post-disaster situation on the ground.

In order to achieve this, fieldwork was conducted in tandem with the development of a hybrid methodology specific to this research, which involves two significant case studies. The fieldwork observed the realities of post-disaster situation by engaging with local people and acquiring their personal insights concerning their genuine experiences of the aftermath of flood disaster. The arguments in this study are based on empirical research and experience 'from the field'. The study suggests the utilisation of narrative as a medium of exploring the case studies. Narrative offers diverse ways of knowing and understanding the affected communities by scrutinizing their identities, beliefs, culture and experiences. Furthermore, the information gathered continues to be beneficial for affected communities to reflect on throughout the course of rebuilding or constructing permanent resettlement after disaster. Meanwhile, narratives gathered from the architects on their potential role in post-disaster were relevant, in order to challenge them to think critically and act responsibly in response to future disaster situations.

Due to the complex scenes comprising overlapping narratives, stories and relationships, I developed and analysed all case studies using visualization methods through maps, diagrams and timelines. These methods were mainly used **to understand the process** of who were the



key stakeholders as well as their involvement, and actions and decision-making that had already taken place. Consequently, these diagrams were also used **to review and evaluate how the situations are being challenged, adjusted and adapted through space and time.** The outcome established from both case studies contradicts some of the expectations of the study as it uncovered a more multifaceted and uncertain situation for flood response and recovery, especially during its '**transition period**'. Therefore, the fieldwork and case studies in this research are imperative, as it is grounded and offers an in-depth view of the post-disaster situation.

### 7.1.3 Question 3: What can be learnt or reflected on from the relocation and resettlement processes post-disaster?

The role of a shelter after a disaster is an interconnected issue. The case study in Kota Tinggi for example, demonstrated four categories of situations occurring as a result of the relocation of the flood-affected community to a new permanent settlement. This includes people returning back to their original settlement or *kampung* because they were unable to establish feasible means of livelihood in their new location, Desa Sejahtera<sup>59</sup>.

During the fieldwork, it was observed that the housing solutions provided only reflect the idea of the providers (or certain stakeholders) rather than the actual needs of the relocated community as to complement their way of life and culture. Nevertheless, this does not mean that the architects could potentially and literally bring forth the original settings and visual appearance to recreate a familiar place for the community. Instead, the process of resettlement requires critical thinking in the process of appropriately developing the design and planning of post-disaster outcomes with the community in mind.

A number of respondents in the study were critical in the lack of engagement between stakeholders during the development of Desa Sejahtera. The respondents also highlighted that they preferred not to be left behind and wanted their voices to be heard during the process, particularly in relation to their needs and desires. Additionally, the study shows that housing requirement was not only the main focus, but people were also concerned with the social or private living spaces, employment

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<sup>59</sup> Desa Sejahtera is a new resettlement built for the flood-affected communities in Kota Tinggi. Refer to section 4.

opportunities and access to other public services. These issues were neglected as the adaptability to the new spatial environment became challenging when compared to their previous *kampung* living.

Disaster-affected people often described their experience with the impression of “before” and “after” the flood disaster event. A *Kampung* house is usually resided in by generations of families, thus it was an expression “before” in recalling their identity, pride and significant meaning for the residents. Hence, the strong attachment to their house, as well as their needs and cultural background may be among the challenges to the development of new settlements. These requirements would need careful architectural translation in the collaborative efforts for an effective post-disaster resettlement. In this particular exercise, consideration of the “after” of a disaster should take into account the continuation of the characteristics relevant to the sense of place, sense of belonging and sense of cultural values among the affected community as essential.

7.1.4 Question 4: How could the concept of temporary home in transition and transit time help in improving the architectural aspects of post-disaster resettlement?

The **transit time** defined in this study refers to the uncertain **transitional process in between two periods: the original settlement and the new resettlement**. Transit time has come about as a result of sudden disaster disruption affecting communities. The settlement aspires to be certain and predictable, however the permanent resettlement at a later stage may not be the ‘end product’ or the ‘final result’ of post-disaster recovery. This is because the process of adapting and adjusting to the new settlement will continuously take place until it caters for the community needs and the changing climate challenges in the future.

While many studies focus on transitional shelters provided during disaster relief, **this research anticipates them as transitional dwellings that need to be understood in terms of the transition time**. Most existing research on disaster response tends to articulate the need for ‘houses’ as an immediate solution for long-term post-flood disaster recovery. This study has instead highlighted the need to emphasize the remaking of ‘home’ - about understanding the community, the neighbourhoods, the *kampung* or local space - before thinking of the ‘house’ as an object of a predetermined or definitive output. Therefore, **this study aims to steer**

**away from the 'object' but rather focuses on the time and space of relocation.**

Issues within the transitional period such as the provision for transit or temporary shelters were argued to be redundant and costly by some agencies. They claimed that immediate priority should be given in facilitating long-term houses rather than accommodating temporary dwelling demands. However, the study identifies that the **transitional** period after a disaster is a crucial phase in providing a platform for a long-term and permanent home for the beneficiaries. In some cases, the transitional episode is an **uncertain phase** where some of the temporary shelters have eventually turned out to be occupied for longer, while gradually forced to comply with permanent essential assessments. Therefore, the beginning process of transit time should not be treated simply as a 'temporary' phase, as people may have to stay for a longer period. This was the case for Kota Tinggi and Kuala Krai where the affected communities had to endure living in temporary houses for 2 to 5 years.

## **7.2 Contribution of study**

The study has contributed to both the scholarship and practice of architecture in inquiring into and understanding the issues of post-disaster resettlements, particularly for flood disaster in Malaysia. This section highlights three significant contributions made by the study.

### **7.2.1 Case studies**

The study presents two notable cases in relation to post-flood disaster recovery and relocation in Malaysia, which have yet to be reviewed and documented, thus adding to the body of knowledge from an architectural point of view. The first case study in Kota Tinggi, which experienced two consecutive floods in December 2006 and January 2007 is testimony to an action of displacement of 360 families from six different *kampung* and their 'merger' into a modern terrace-house resettlement named Desa Sejahtera. The study enquired on what can be learnt from previous resettlement processes, which could be relevant to present-day flood disaster responses. It reviewed the principles underlying the resettlement process as well as the current growth and development of the resettlement after its initial occupation.

The second case study was of Kuala Krai, an area which had experienced an unprecedented major flood disaster in December 2014. The flood occurred unexpectedly during my initial phase of fieldwork in Malaysia. This provided an important trajectory to the study and opened up an opportunity to explore and re-examine the post-disaster recovery first-hand. I was able to find out about common practices being undertaken in the real-life context in real time. It also allowed for reflection on the processes of resettlement I had been studying from the first case study of Kota Tinggi. Consequently, the study discovers the necessity to appreciate the period of 'transit home in transit time' in order to improve the outcomes of any post-disaster resettlement.

### 7.2.2 Transit time: understanding transit home in regards to time.

The study demonstrates **an understanding of the concept of transit home in regards to transit time** and how this transition period plays an important role in the remaking of long-term recovery such as post-disaster housing resettlement. Dwelling in transition, usually in a temporary state, is not only about providing a place for people to stay away from danger, bad weather or shelter. However, the study proposes that it is also a period of opportunity to reorganize and reevaluate the needs of the community - as a plan of action, for future strategies, ideas and resources which were available previously and that may not have been available before, in order to create a more resilient community within the new resettlement.

The study gained insights from multiple perspectives on post-disaster responses and responsibility, predominantly relating to the architect's role. Rather than focusing on designing an 'object' or 'product' with technical efficiency for mass production, or short-term solutions such as emergency shelters, architects may need to take more initiative during the period of transition (that may sometimes be extensive) to build trust, enquire and engage with the flood-affected communities. Stories from the people are not just about their experiences facing the disaster but are often rich with details that bring into light their past experiences, community, culture, economy and environment.

'Living in transition' is not only a common phase after a disaster. However, the study justified it as an important and critical phase for everyone, especially the subjects within the study, i.e the affected community and architects (as professionals in the building industry), in

rethinking and rebuilding long-term recovery for the flood-affected communities. Therefore, the study posits that the long-term post-disaster planning or course of action should have been initiated at the beginning of the recovery phase, which also includes architects as one of main facilitators among the stakeholders. Furthermore, the strategy for post-disaster action should extend beyond the completion of a new resettlement to include post-resettlement enquiry that was disregarded previously such as in the Desa Sejahtera development. The strategy and actions taken during the period of post-disaster recovery should allow for continuity from one phase to another and it should be understood as a collaborative practice amongst everyone involved.

### 7.2.3 Fieldwork and case study as hybrid methodology

The study has developed a hybrid methodology that involves fieldwork and case studies as part of an empirical exploration to examine a situation within a real-life context. The study offers valuable tools in exploring the effectiveness of architectural responses in post-disaster situations. This includes the use of narratives (interviews and workshops with disaster-affected people and architects involved), field-notes, documentary and anecdotal evidence, direct observations, workshops and mappings.

The information gathered helped in the endeavour to understand and explore in depth the ever-challenging transition within post-disaster situations. It allowed me to gain insights into the essential aspects that contribute to the remaking process of a new settlement for flood-affected communities. The study demonstrates a responsive mode of research that is distinctive due to the unprecedented major flood event that occurred in 2014 during the first phase of fieldwork. This unexpected situation required me to rearrange the study trajectory in order to respond and readapt to significant circumstances at that particular time. It was also an opportunity for me to experience first-hand the flood disaster aftermath and to gain a better comprehension of post-disaster recovery in comparison to the previous flood-disaster recovery in Malaysia.

The study suggests the use of narratives as part of an approach to comprehend the real situation on the ground. The stories gathered disclosed an intertwining between a person's emotions, memories, environment, traditional knowledge or wisdom, and culture. Working

with people's personal narratives may help architects to capture the essential qualities and experience required of an appropriate dwelling in the new resettlement otherwise not available. This approach also acknowledges the importance of architects' 'engagement' with the community to develop long-term permanent resettlement as the study highlights their role and responsibility beyond the technical but for a social means in the making of a settlement.

The study further advocates the need to extend the use of narrative methodology in both architectural research and practice relating to the field of post-flood disaster responses, population movement and flood-resettlements. Architectural practice normally adopts the problem-based approach focusing on a particular situation on the ground and at a specific moment in time. However, adapting narrative methodology in both the research and practice could add value to the architectural process and its outcome. The ramifications to this adaptation will allow architects to look at the immediate issues at hand while at the same time enabling future projections of affected communities. This methodology is useful for creating long-term new resettlements that cater for the present as well as the future - partly an aspiration for all-inclusive and sustainable settlements in Malaysia. Eventually, the situation calls for a potential future role of architect-researcher-practitioner in unison.

On the other hand, the narrative methodology will also be beneficial to contemporary architectural education; towards a scenario-based-learning approach. The narrative methodology is also mentioned to allow students to respond to immediate issues at hand, while creating future scenarios, which acknowledge the overarching set of values derived from the communities themselves. The approach in narrative methodology make plans for a more holistic reaction within architectural education in allowing students to view scenarios or issues from both the scientific and the personal, as well as in the present and projected outcomes.

The visual diagrams and representations were a novel addition to the study as important tools deployed throughout the research, allowing for continuous scrutiny as more information was gathered and analysed from the fieldwork. The diagrammatic mapping developed in this study seeks to bring clarity to the complexities that were associated with post-disaster recovery and response between the two case studies. It identifies

the activity patterns of displacements and relocations, which occurred immediately after the flood and during the temporary placements.

The mapping emphasised the key stakeholders and local residents positions, and their relationship and involvements over the transit period. It also exposed any situations that overlapped or interconnected among each other during the process in order to gain better understanding of the responsibilities of key players. The connectivity of the diagrams provides the means for rectification in the actions of stakeholders for future disaster recovery measures. More importantly, the mapping reexamined the question of where architects can fit in within the recovery period in an effort to advocate their role not within the lowest level of disaster recovery list, but as one of the key actors participating in the collaborative effort of rebuilding communities post-disaster.

### 7.3 Recommendations for Future Research

The study revolves around the role of architects in post-disaster recovery and how the concept of **transit home in transit time** contributes to the development of post-disaster resettlement. The study also emphasised the importance of acquiring and sharing knowledge through narratives and the skills required to obtain or disseminate them. In this regard, the study presents three recommendations for future research concerning these corresponding topics.

Firstly, the study has revealed that there is lack of data on post-disaster recovery and resettlement, particularly in the context of Malaysia. Therefore, documentation on post-disaster resettlement and housing in Malaysia - from both users and architectural perspective are essential. A potential case study to pursue will be the resettlement of Kampung Telekung that is due to the displacement from the Kuala Krai major flood in 2014. Developing a platform or database may provide useful references for future stakeholders, mainly the professionals in the building industry such as architects and designers in facing future post-disaster recovery situations and actions. There are at least eight resettlements (section 5.5.3) recorded being developed after the flood disaster in 2014 in Kelantan alone that have potential for observation and evaluation. Furthermore, further research on the ideal scales and patterns of post-disaster settlement in Malaysia will be another significant addition to the architectural knowledge in facing ever-changing and ever-challenging future climate change impacts, such as flooding.

Secondly, the study uncovers the situation of dwelling in transit time. However, it does not explore the subsequent stages of resettlement during the process where people are relocated to new permanent resettlement development such as Kampung Telekung. This may require a long-term research on situations occurring after the period of transit home by observing the adaptation of inhabitants in their livelihoods, in their activities, relationships and culture. Moreover the important question remains as to what extent should architects continue to be involved in long-term future disaster recovery?

Thirdly, the study advocates that architects should be the members of all formal institutions charged with responding to flooding events or disasters in Malaysia. As emphasised throughout the thesis, the architects' role is vital in post-disaster recovery and therefore, their involvement should not be until the end of the recovery process - to design new resettlements or houses for those affected. However, the study believes that architects' participation should begin earlier during the emergency response, through transition time and resettlement. An architect has an understanding of a scientific narratives.

Transit home in transit time is an essential platform for architects to experience, observe, be informed of the situation on the ground, and reflect the necessary information towards the design for post-disaster resettlement. Potentially, the architects, together with the affected communities could use this platform as an experimental ground to start a new conversation and test out new ideas for their permanent resettlement later on.

Architects have to know top down (scientific narrative) and at the same time to gather information on the ground (bottom up). Combining both, the architect may have a chance to produce better resettlement. In this aspect, the study views post-flood recovery architects as mediators between the scientific narratives and the personal narrative.

#### **7.4 Conclusion**

This study has argued that a more holistic perspective is required to understand the causes and consequences of flooding, displacement and planned resettlement in Malaysia. While projects for resettlement of communities currently living in floodplains meet both the objectives of development and adaptation measures of governments, there are many



ways in which resettlement does not take account of the residents' views and experiences.

This study also warns against the way in which a, 'dominating construction of climate change as an overly physical phenomenon readily allows climate change to be appropriated uncritically in support of an expanding range of ideologies' (Hulme, 2008, p. 9). Technical responses that view resettlement as an issue of simply providing adequate housing and infrastructure are often tied to political ideas of 'development'. At the same time, they obscure the importance of indigenous knowledges for adaptation to climate change.

This study thus underlines the need for careful examination of adaptation measures while at the same time pays more attention to their discursive and political aspects. Full awareness of the various impacts of resettlement in Malaysia in the context of climate change is important for architects to understand how it might be possible for flood-affected communities to continue 'living with floods' and to encourage 'living with [new] resettlement'.

The study highlights the need for stakeholders; especially architects to acknowledge the significance of the **transit home** in terms of space and time. Understanding this concept will help architects to navigate themselves on how they, as professionals and community advocates, can and should fit in within the process. This includes the need to comprehend the complexity of Malaysia's recovery process that involves multiple stages and actions from other government or private agencies - at times redundant. Furthermore, by being involved with the recovery process, an architect has to acknowledge the social and cultural needs of communities, at a personal as well as communal level. Therefore, the study asserts that the use of recovery diagrams, narratives and other methods of enquiry postulated in it could help with the architects transition from designing buildings to designing appropriate and culturally relevant disaster recovery resettlement.



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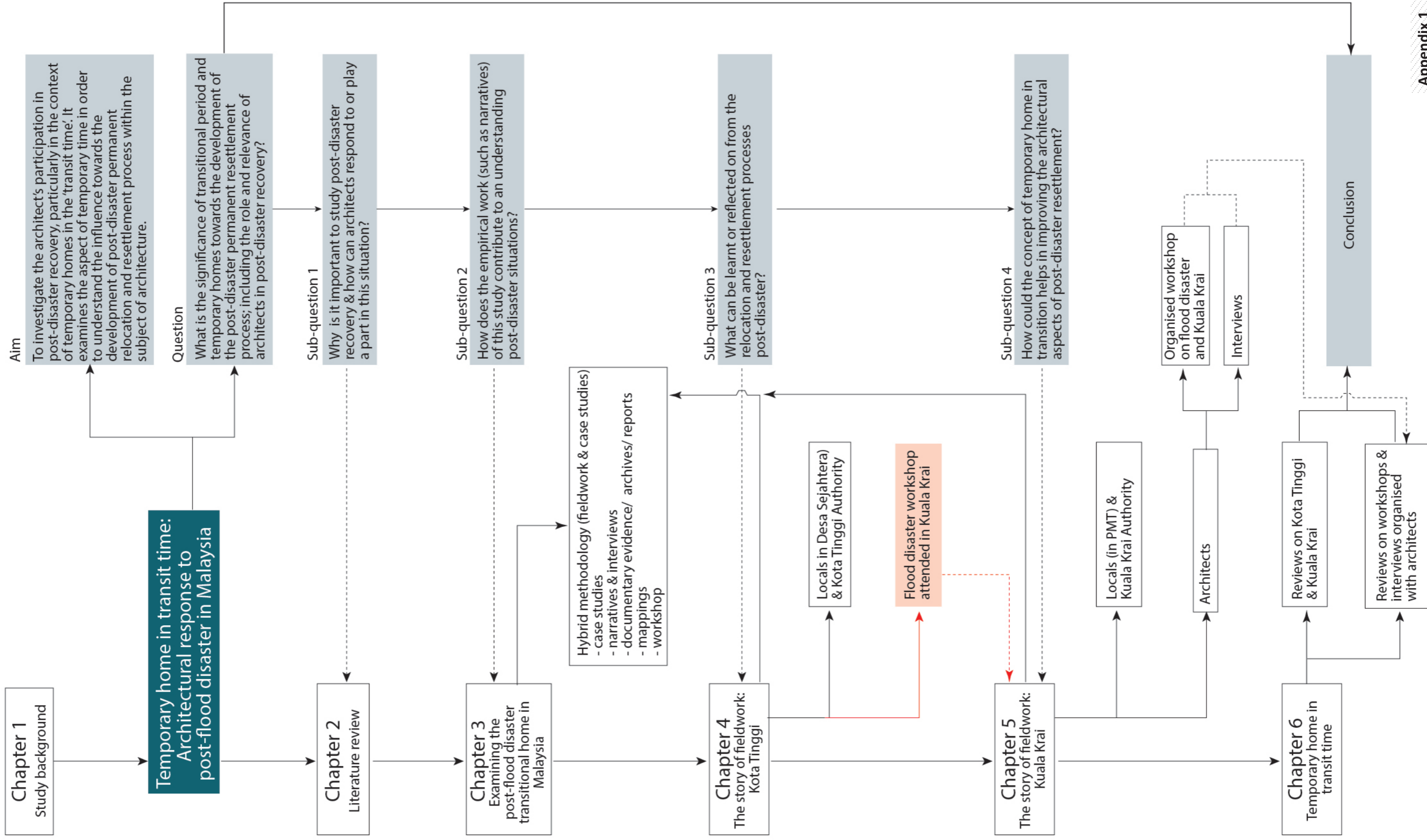
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# Appendices

- a) Thesis diagrams
- b) Ethics Approval and Participant Approval sheet.
- c) List of seminars and conferences (presented)
- d) List of publications



**Main Voluntary Organisations/ NGOs**

- Fire & Rescue Dept
- Royal M'sia Police
- M'sia Armed forces
- Civil Defence Dept
- SMART
- Hospital
- Social Welfare Dept
- M'sia Red Crescent
- St. John Ambulance
- RELA
- Public Works Dept
- Geological Dept
- Information Dept
- Local Authorities
- TNB
- STMB

MSNC  
DIRECTIVE 20  
Disaster  
Management  
Level



Flood 2006/07



**Johor**

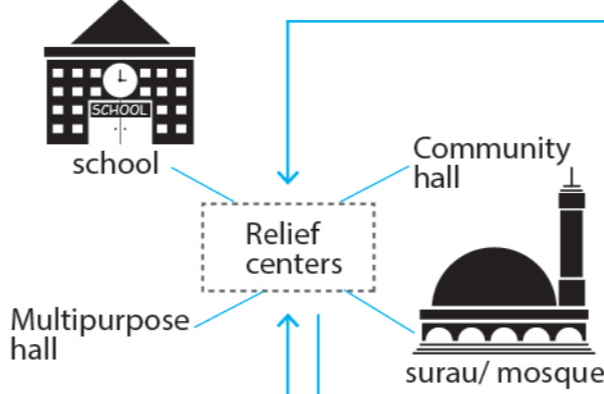
flood areas  
(research focus)

- Kg. Batu 25
- Kg. Makam
- Kg. Tembiah
- Kg. Sungai Berangan
- Kg. Kelantan
- Kg. Panti

flood impact

- Destroyed house 6 houses
- Damaged houses
- Damaged infrastructures — Roads, water, electricity, telephone lines
- Damaged administrations and commercial buildings

where to save life?



land matters scenarios

- Reserved land, House owner
- Land owner, Multiple houses
- Different land owner, House owner
- Land owner = House owner

Aids

individual/  
private  
company

prepare relief center

enough food supply

Dept of Social Welfare

District Council

victims particular details gathered as record

Land & District Office

period after flood receded

state govt.

Agencies

NGO(s)

individual

Initiated & funded by Federal & Johor State Govt.

Federal & State govt. to find suitable land for permanent house

new resettlement



Desa Sejahtera

Temporary place

Govt. house (rent paid by govt.)



Rebuilding house on their own land



Make good

What can be learnt from Kota Tinggi?

Case study: Research interviews

Beneficiaries/ flood victims

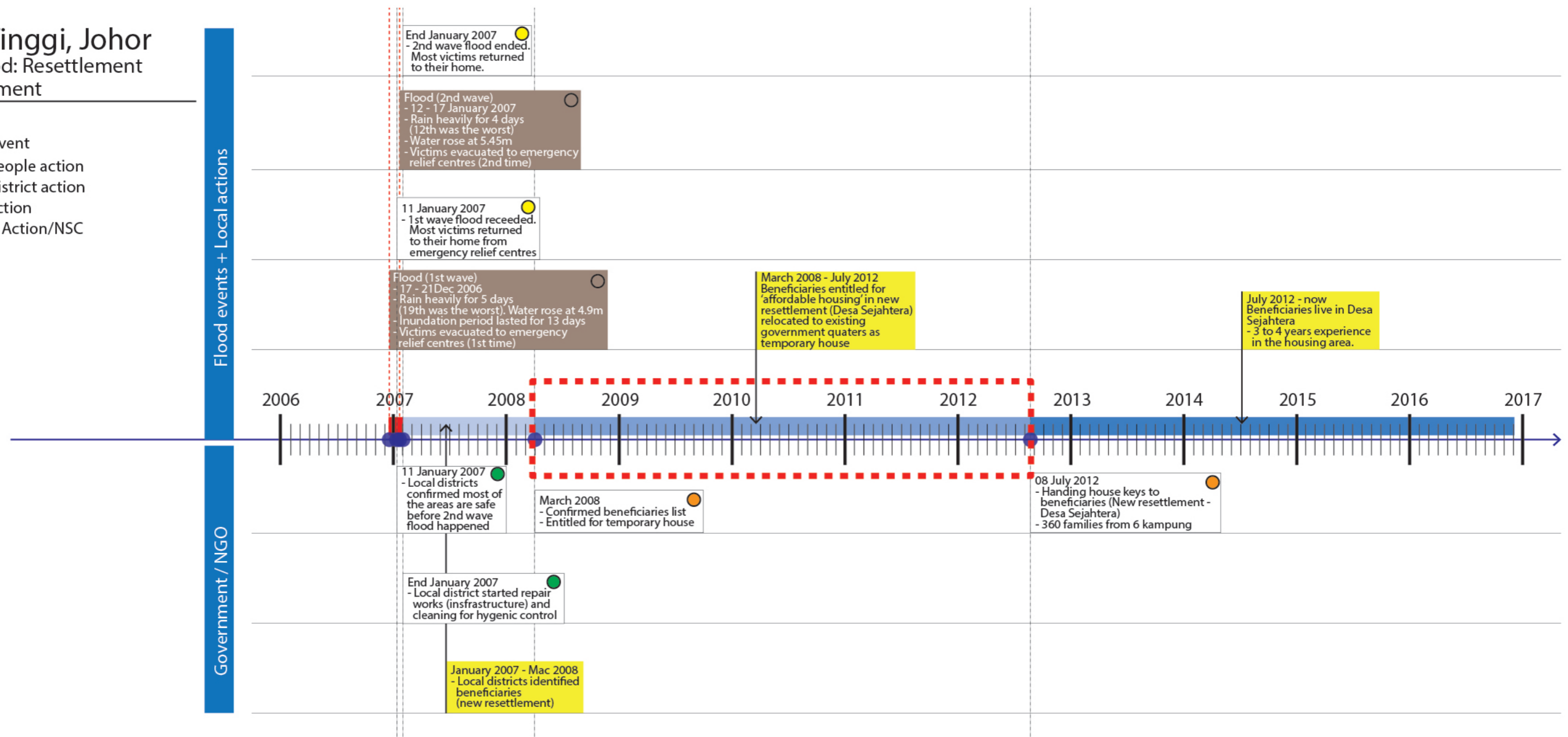
- Pak Jamal
- Pak Jamal's wife
- Haji Daru
- Haji Daru's wife
- Seha Jufri
- Kak Aida
- Pak Yusof
- Mak Yah
- Kamsiah
- Eja
- Salbiah
- Rejab
- Zainab

# Kota Tinggi, Johor

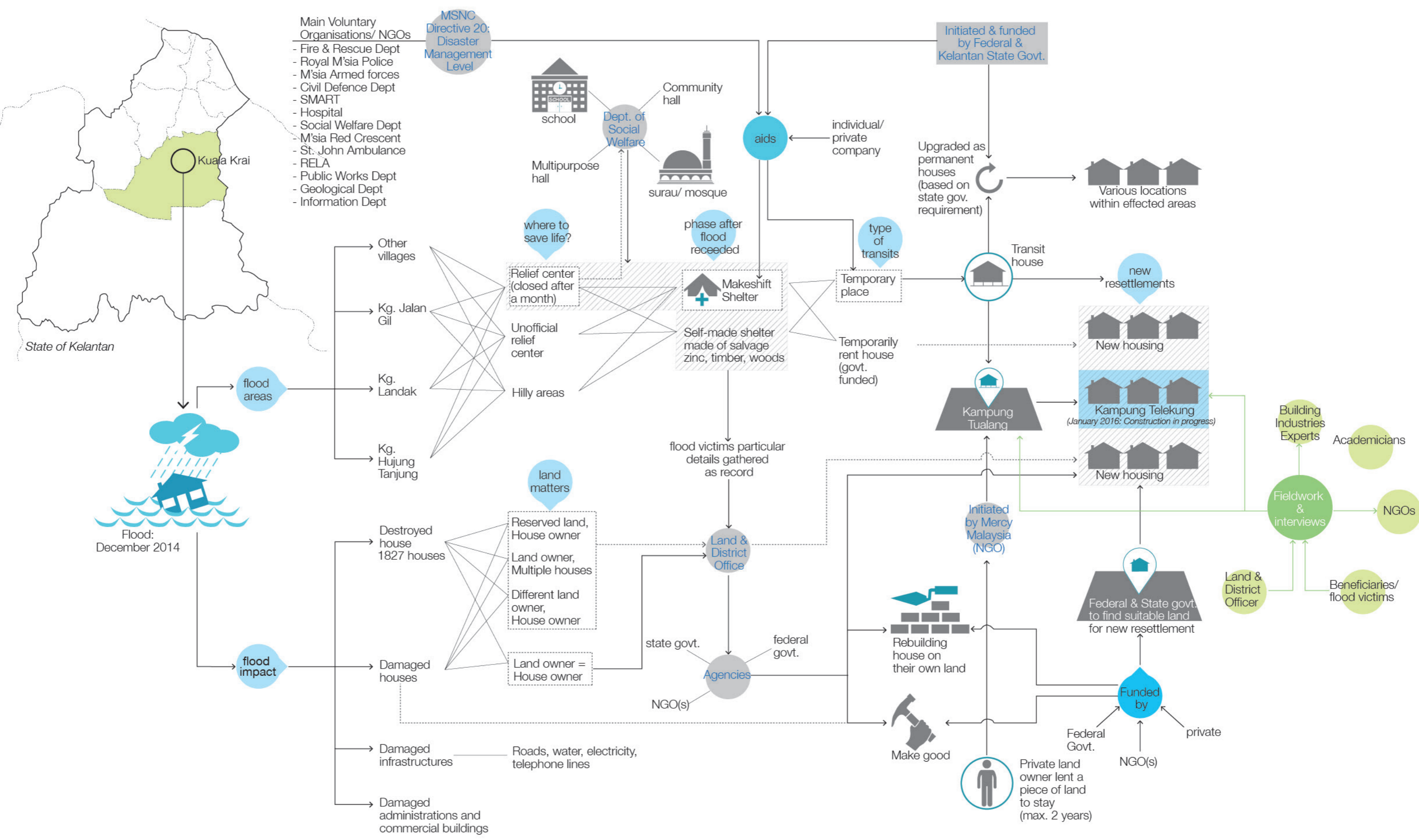
## Post-flood: Resettlement development

### KEY

- Flood event
- Local people action
- Local District action
- State Action
- Federal Action/NSC
- NGO



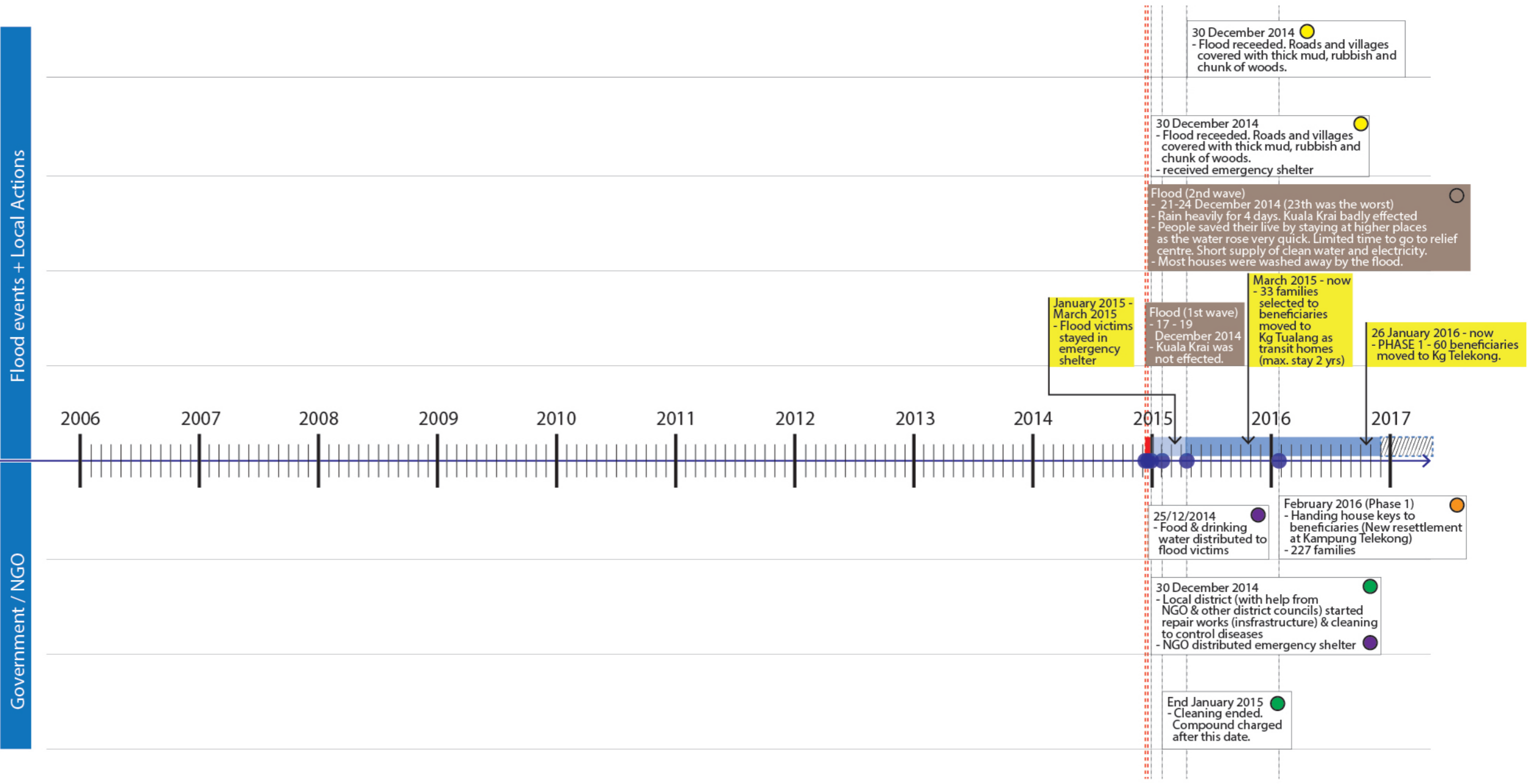


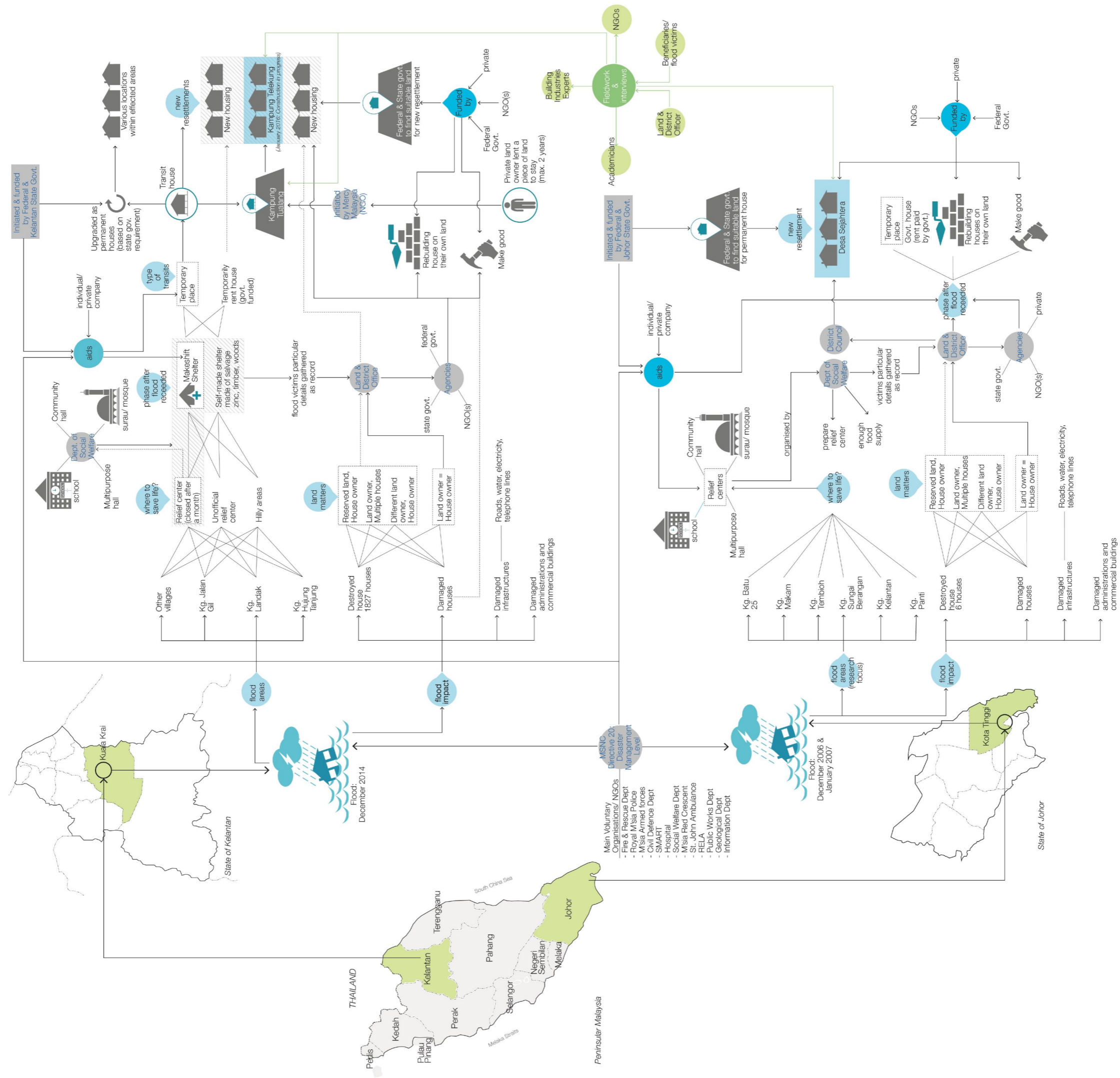


# Kuala Krai, Kelantan

## Post-flood: Resettlement development

- KEY**
- Flood event
  - Local people action
  - Local District action
  - State Action
  - Federal Action/NSC
  - NGO

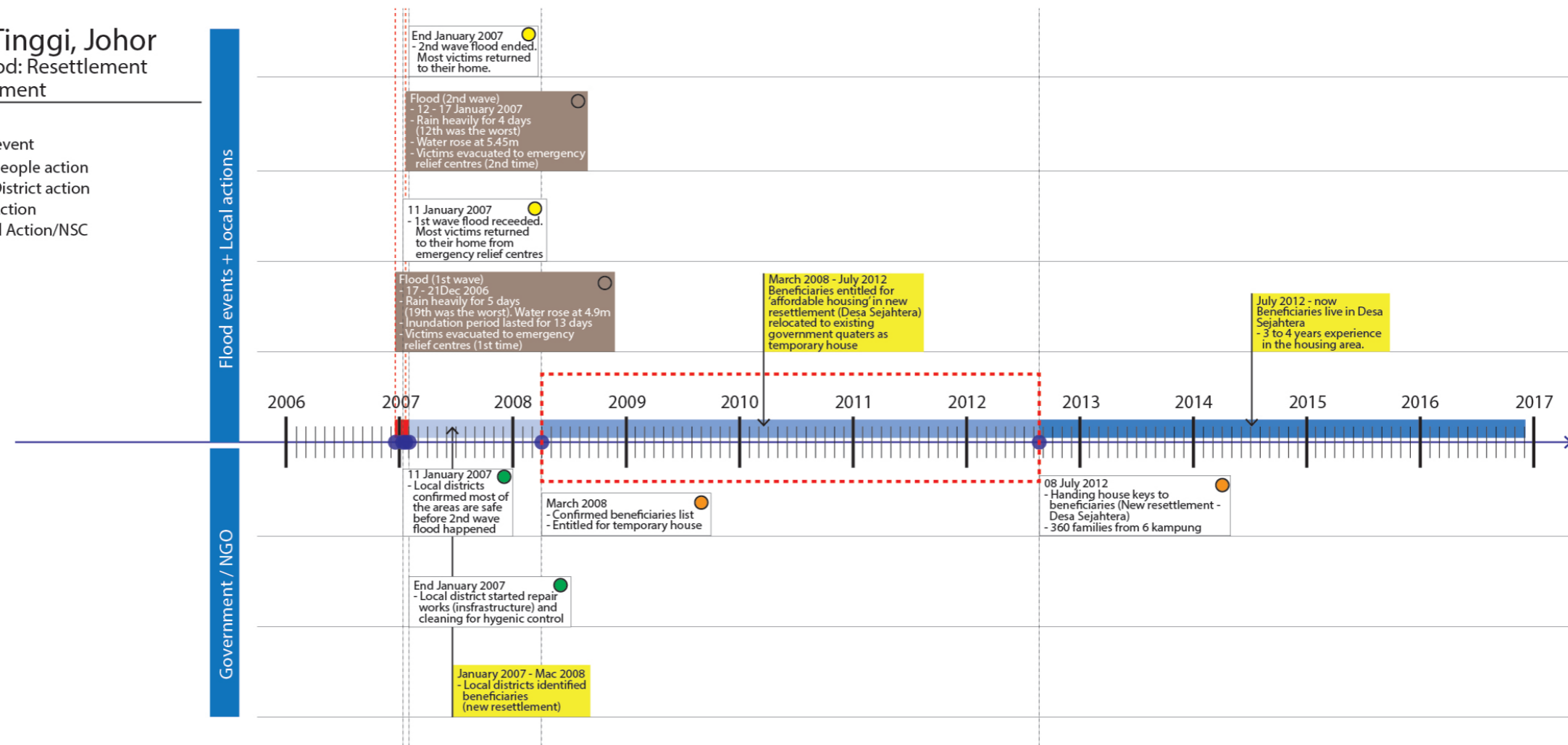




## Kota Tinggi, Johor Post-flood: Resettlement development

### KEY

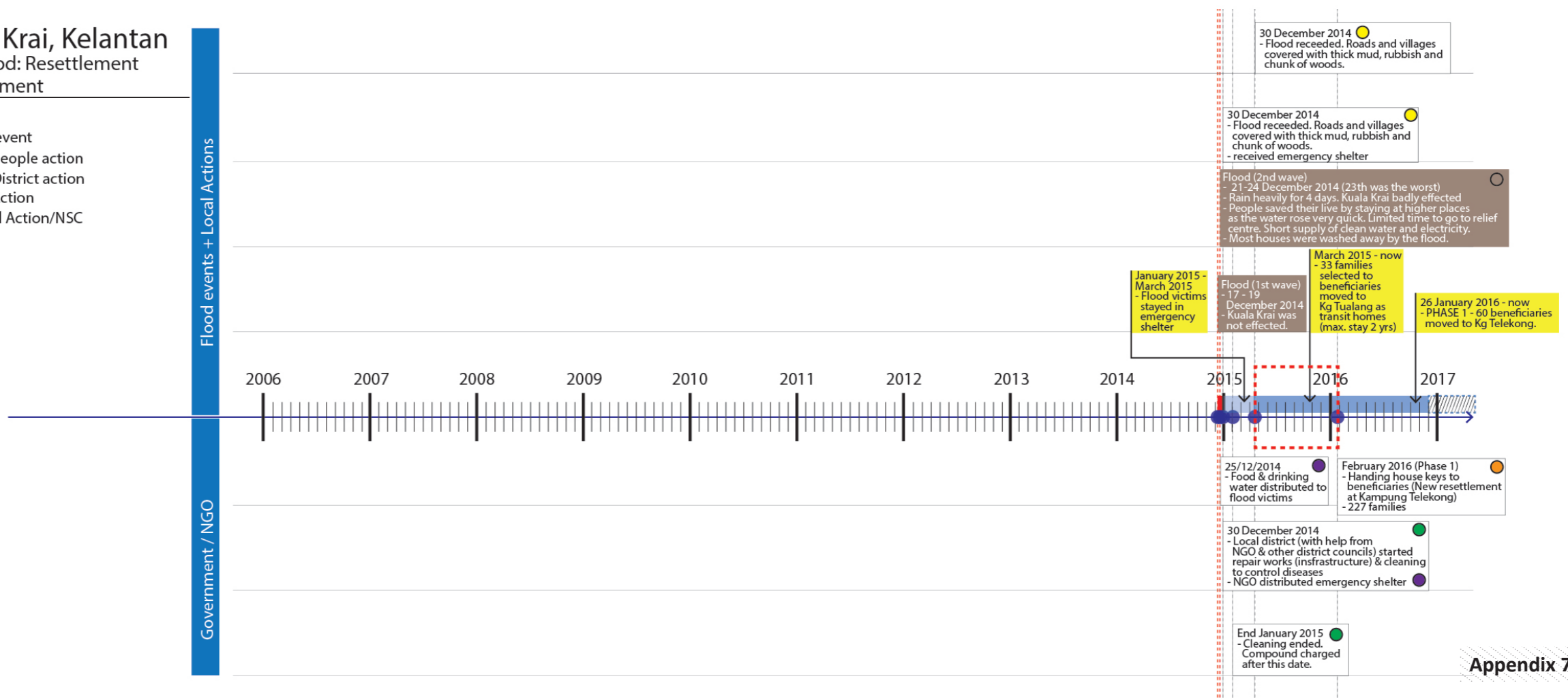
- Flood event
- Local people action
- Local District action
- State Action
- Federal Action/NSC
- NGO



## Kuala Krai, Kelantan Post-flood: Resettlement development

### KEY

- Flood event
- Local people action
- Local District action
- State Action
- Federal Action/NSC
- NGO





The  
University  
Of  
Sheffield.

School  
Of  
Architecture.

Ethics Coordinator/Administrator  
**Dr. Michael Phiri**

School of Architecture  
University of Sheffield  
The Arts Tower  
Western Bank  
Sheffield, S10 2TN

2 May 2014

**Telephone:** +44 (0) 114 222 0363  
**M:** +44(0) 7710 065 062  
**Email:** [m.phiri@sheffield.ac.uk](mailto:m.phiri@sheffield.ac.uk)

*Ms Nor Izura Binti Tukiman*  
*School of Architecture*  
Dear *Nor Izura*,

**PROJECT TITLE: CLIMATE CHANGE IN MALAYSIA: ACTION RESEARCH ON CHANGING ARCHITECTURAL PRACTICES IN DESIGNING FOR FLOOD RISK SCENARIOS**

On behalf of the University Ethics Reviewers who reviewed your project, I am pleased to inform you that on *2 May 2014* the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documents that you submitted for the ethics review:

1. University Research Ethics Application Form for Staff & PGRs (*dated 2 May 2014*)
2. Participant Information Sheet (*dated 17 February 2014*)
3. Participant Consent Form (*dated 17 February 2014*)

However, the ethics reviewers have suggested that you consider the following amendments, which you can choose to follow or to ignore:

- (i)...
- (ii)

If during the course of the project you need to deviate from the above-approved document please inform me. Written approval will be required for significant deviations from or significant changes to the above-approved documents. Please also inform me should you decide to terminate the project prematurely. At the end of the project please send me a summary report of how the ethics was managed and what lessons can be drawn.

Yours sincerely

*Michael Phiri*

Michael Phiri PhD  
Ethics Coordinator/Administrator



Downloaded: 23/05/2017

Approved: 12/11/2015

Nor Izura Tukiman  
Registration number: 120237632  
School of Architecture  
Programme: Postgraduate Research Project

Dear Nor Izura

**PROJECT TITLE:** Architecture and climate change in Malaysia: Changing architectural practice in designing for post-flood scenario

**APPLICATION:** Reference Number 006525

On behalf of the University ethics reviewers who reviewed your project, I am pleased to inform you that on 12/11/2015 the above-named project was **approved** on ethics grounds, on the basis that you will adhere to the following documentation that you submitted for ethics review:

- University research ethics application form 006525 (dated 03/11/2015).
- Participant information sheet 1013227 version 1 (03/11/2015).
- Participant information sheet 1013226 version 1 (03/11/2015).
- Participant consent form 1013225 version 1 (03/11/2015).

The following optional amendments were suggested:

*1. You need to review the potential for harm section and reflect on any harm associated with asking participants to reflect on major flooding events that they have been caught up in. You should be sensitive to how interviews proceed if for any reason a participant recalls upsetting events... or affirm that that the proposed direction of questioning related to physical rebuilding is unlikely to present any concerns. 2. The information sheet should include a statement about being able to withdraw at anytime without reason. 3. On data storage, the practicality of keeping information is not a key driver: your consent form asks participants to agree that the data collected can be used in future research. You state that all research material will be anonymised. Do you need to retain any personal identifying material for future research or just the anonymised information if participants have agreed for research material to be reused? Suggest anything without consent, or material connected to data where consent has been given but it is otherwise unnecessary to retain (e.g. video, audio, non- anonymised personal data), should be destroyed at the end of the project.*

If during the course of the project you need to [deviate significantly from the above-approved documentation](#) please inform me since written approval will be required.

Yours sincerely

Christie Harrison  
Ethics Administrator  
School of Architecture



The  
University  
Of  
Sheffield.

School  
Of  
Architecture.

Participant Information Sheet  
**Architecture and climate change in  
Malaysia: Changing architectural practice in  
designing for post-flood scenario.**

24 May 2017

Nor Izura binti Tukiman  
Level 9, Graduate School,  
School of Architecture,  
The University of Sheffield  
The Arts Tower, Western Bank  
Sheffield  
S10 2TN, UK

Telephone: +44 (0) 74422 09933  
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Fax: +44 (0)114 222 0315

*You are being invited to take part in a research project which is being carried out by the Nor Izura binti Tukiman, a PhD student at the University of Sheffield. This participant information sheet is an overview of the purpose of the research and the interview process. It is important that you understand why this research is being done and what is involved. Please take time to read the following information. Thank you.*

The study highlighted the role of architecture in addressing Malaysia's future in the context of climate change; that focuses on flood disaster and post-flood impact. In Malaysia, flooding occurs annually and accounts for significant losses, both tangible and intangible. Flood is predicted to become more vulnerable in the future. Hence, it is imagined to affect people's life experiences in many ways that are difficult to anticipate, especially in rebuilding their lives after the disaster.

Data will be gathered from two groups of participants, which are the expert including architects, local authority, NGOs, academicians and other related professionals as to understand the issue proficiently and the non-expert which are the villagers as they are those with first hand flood experience. Both groups are important in this research in order to get insights from professionals of their approach to help mitigate and adapt with disaster responses. Meanwhile, insights from the non-expert are concerning on their living and rebuilding experience before and after the flood. It is also to hear their authentic voices and listening to their stories, insights and experiences about these historical and contemporary events. This includes their needs, lifestyle and culture. The research will then attempt to link between these two needs and understanding through design implementation. Whilst there are no immediate benefits for those people participating in this research, it is hope that this research will provide new insights for those who are disseminating information about climate change into architectural practice also as a practical guidance for architects adapting their designs for climate change, in particular extreme flood events.

Data will be mainly collected in the form of semi-structure and unstructured open-ended interviews - singly or in-group, in Malay or English. These should allow a certain degree of freedom for the researcher and permit spontaneity rather than forcing participants to select from predetermined responses during the discussions. This interview session will be audio recorded, transcribed and later translated into English (if necessary). All of the data collected during this interview is strictly confidential and will be anonymised. Data from the research will be used in the production of the PhD thesis and will also be presented at academic conferences and published in research journals.

---

This research is supervised by Dr Renata Tyszcuk and Dr Beatrice De Carli, and has received ethics approval from the Ethics Committee of The University of Sheffield. If you need to contact the research supervisors or the University please find details below.

Contact details for the research supervisors:

Dr Renata Tyszcuk      Telephone: +44 (0) 0114 222 0313      Email: r.tyszcuk@sheffield.ac.uk  
Dr Beatrice De Carli      Telephone: +44 (0) 0114 222 0359      Email: b.a.decarli@sheffield.ac.uk  
School of Architecture, University of Sheffield, The Arts Tower, Western Bank, Sheffield, S10 2TN, UK

Contact details for the University's Registrar and Secretary:

Office of the Registrar and Secretary, Firth Court, Western Bank, Sheffield, S10 2TN, UK  
Telephone: +44 (0) 0114 222 1100      Email: registrar@sheffield.ac.uk



THE QUEEN'S

List of seminars and conferences (presented)

1. *'A temporary home in transit time: Architects in Post-disaster in Malaysia'* (2017). PhD research presented at the Design, Engagement and Practice Research Group Seminar, at the School of Architecture, University of Sheffield, UK.
2. *'Post-flood disaster responses: Experiences in Kuala Krai, Kelantan'*. (2016) Presented in Open talk for Malaysia in Focus, Talks on Multi-disciplinary Research and Practice, University of Sheffield, UK.
3. Nor Izura, T., (2016) *'Challenging Practice: post-flood disaster assessment in Malaysia'*. Poster presented for the Doctoral Academy Conference 2016, The University of Sheffield, Sheffield, UK.
4. Nor Izura, T., (2016) *'Recovery and Resettlement: 2006-2007 flood responses in Johor revisited'*. Poster presented for KROTO Research Inspiration Poster Competition '16. Awarded 'High Commended'; The University of Sheffield, UK.
5. Nor Izura, T., Tyszczyk, R., (2015) *'Post-flood disaster responses in Malaysia: Kota Tinggi resettlement revisited'*, in : *Wisdom of Tropics: Past, Present & Future*. Paper presented at the International Joint Conference SENVAR-iNTA-AVAN 2015, Institut Sultan Iskandar (ISI), Universiti Teknologi Malaysia, Johor, pp 6-55 – 6-71.
6. *'Post-flood disaster responses in Malaysia'*. (2015) PhD research presented In house Seminar at Sheffield School of Architecture; The University of Sheffield, UK.
7. Nor Izura, T., (2013) *'Climate change: From international agreement to national action: The case of Malaysia and architecture'*. Poster presented at the Postgraduate Research Conference entitled 'Translation and transformation', The University of Sheffield, Sheffield, UK.



List of publications (Conference paper and posters)

1. Nor Izura, T., Tyszczyk, R. (2015) *Post-flood disaster responses in Malaysia: Kota Tinggi resettlement revisited*, in: *Wisdom of the Tropics: Past, Present & Future*. Presented at the International Joint conference SENVAR-iNTA-AVAN 2015, Institut Sultan Iskandar (ISI), Universiti Teknologi Malaysia, Johor, pp. 6-55-6-71.
2. Nor Izura, T. (2016, July) *Recovery and Resettlement: 2006-2007 flood responses in Johor re-visited*. Poster presented for KROTO Research Inspiration Poster Competition '16 (Received High Commended 2016) at The University of Sheffield, Sheffield, UK.
3. Nor Izura, T. (2016, June) *Challenging Practice: post-flood disaster assessment in Malaysia*. Poster presented for the Doctoral Academy Conference 2016, The University of Sheffield, Sheffield, UK.
4. Nor Izura, T. (2013, June) *Climate change: From international agreement to national action: The case of Malaysia and architecture*. Poster presented at the Postgraduate Research Conference entitled 'Translation and transformation', The University of Sheffield, Sheffield, UK.

## **Post-flood disaster responses in Malaysia: Kota Tinggi resettlement revisited**

Nor Izura Tukiman<sup>1</sup>, Renata Tyszczyk<sup>2</sup>

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<sup>2</sup> The University of Sheffield, *Email* : <sup>2</sup> [r.tyszczyk@sheffield.ac.uk](mailto:r.tyszczyk@sheffield.ac.uk)

This paper will explore transformative accounts of adaptation in areas at risk of flooding in Malaysia in the context of increasing evidence of dangerous climate change. It is particularly concerned with the challenges presented to architectural practice in responding to adaptation measures to extreme weather impacts. It is based on fieldwork that took place in Kota Tinggi, Johor and Kelantan in Malaysia during 2014-2015, a time that coincided with the Kelantan floods. The flood disaster that affected Kelantan in December 2014 and January 2015 was unprecedented in Malaysian history. This situation has called for acute measures from different bodies for post-flood actions, including architectural responses to help victims rebuild their spatial environment. Whilst technical strategies to mitigate and adapt to climate change are an ever-increasing field of research, climate change is not just a technical challenge. This paper argues that a more holistic approach is needed in the field of architecture to understand how architects are changing the way they design in order to adapt to a new future with climate change. This paper revisits the flood resettlement projects created in Kota Tinggi and Johor following the floods of 2006-2007. It will discuss what can be learnt from these earlier housing projects that could be relevant to present-day responses to flood disaster. To date, there has been limited research into the spatial and societal implications of climate change adaptation measures. This study seeks to contribute to the debate by providing suggestions and recommendations for the design of resettlement strategies for future victims of flooding in Malaysia

Keywords: post-flood, architecture, adaptation, design, climate change

### **Introduction**

This paper explores transformative accounts of adaptation in areas at risk of flooding in Malaysia in the context of increasing evidence of dangerous climate change. It is particularly concerned with the challenges presented to architectural practice in responding to adaptation measures to extreme weather impacts such as resettlement projects.

The Intergovernmental Panel of Climate Change (IPCC) predicted that the tropical region's annual temperature would increase no less than 10 per cent by 2030 and approximately 20 to 30 per cent by 2070 (IPCC (SRES), 2007). Nevertheless, the future climate scenarios are seen to be more at a global level and unforeseen. While climate researchers and policy makers are increasingly concerned about the potential catastrophic consequences of climate change (Devine-Wright, 2009), people at the 'public' or local level are more unaware of the risks they face (Meerah et al., 2010). Critically, phenomena such as rising sea level, flood, severe haze and landslide (Othman, 2011) that happen at the regional level, affect people's life experiences in many ways that are difficult to anticipate. In recent years there has been increased interest in finding ways to facilitate climate change adaptation, in part as a result of growing recognition that the global community is failing to meet its targets for greenhouse gas mitigation (IPCC, 2014; 2007). Of particular relevance to Malaysia, the role of planned internal resettlement – the 'systematic relocation of groups of people from one or more places to other locations within a given country' (Baird and Shoemaker, 2007, p. 865) has been highlighted as a climate change adaptation measure (Foresight, 2011).

Malaysia is one of a number of countries that is pursuing resettlement projects as a matter of course in response to flood disaster. The aim is to remove people from areas considered to be at risk from an increasingly unpredictable and dangerous climate and to encourage people to resettle in areas considered to be safer, instead of returning to their places of origin post-disaster. However, planned resettlement tends to be presented as a technical exercise involving the supply of new housing and infrastructure to relocated people (Rew et al., 2006). Relocation of people as a response to disaster is a deeply political process that needs to recognise the wider economic, political and cultural conditions that may have given rise to the vulnerability of people to disaster in the first place. It also needs to understand the deep attachment to place and ways of life in areas at risk of disaster.

Whilst technical strategies to mitigate and adapt to climate change are an ever-increasing field of research, climate change is not just a technical challenge. This paper argues that a more holistic research is needed in the field of architecture to understand how architects are changing the way their design in order to adapt to a new future with climate change. The paper explores planned resettlement in Malaysia in the context of climate change.

### **Flooding and resettlement in Malaysia**

Flood scenarios have long been recorded in history and are among the most common hazards in the world (Cook, 2011). In Malaysia, flooding occurs annually and

accounts for significant losses, both tangible and intangible. Malaysians are historically a riverine people familiar with 'living with floods'. The earliest settlements were spread on the major riverbanks in the peninsula, and these highly populated areas are prone to the occurrence of flooding. Around 29,000 km<sup>2</sup> or 9 per cent of the total area of the country is prone to flooding (Che Omar, 2014). At least 4.8million people are estimated to live on the floodplains and are thus vulnerable to floods of different intensities (Che Omar, 2014). The mixing of natural factors, such as heavy monsoon rainfall, intense convection, rain storms, as well as poor drainage and other local factors, means that floods are a common feature in the lives of a significant number of people in Malaysia and an integral part of how they have constructed their communities. People's lives in the flood plain areas are well-adapted to the seasonal monsoon floods that usually take place between November to March and are categorised as 'normal floods' (Chan, 2012). Monsoon rains are needed for agriculture, particularly in the cultivation of rice, so rainfall and floods are seen as a resource and not only a hazard. As a consequence, interactions and response to the threat of external forces of rain and flooding has resulted in the development of highly sophisticated indigenous understanding and knowledge of living in the flood plain areas. Traditionally, houses have been built on stilts to avoid flooding and also to allow room to park boats underneath. Wooden wall panels and platforms are adjustable to allow the water to flow during flooding and thus reduce the impact of the flood to the house. Flood events have shaped the cultural and social life of Malaysian people. As opposed to 'normal' flood, 'major' flood is classified as unusual and extreme events that render people helpless (Chan, 2012).

Malaysia has experienced a series of major floods since the early 1900s. This includes the two waves of flood strikes in Kota Tinggi, Johor nearly a decade ago, in December 2006 and January 2007 (Julien, 2007), and in Kuala Krai, Kelantan in December 2014 and January 2015. Table 1 below shows the flood history in Malaysia including estimates of losses and fatalities (Chan, 2012; Loi, 1996; Ludin and Barau, 2011).

While numerous major flood disasters have occurred in the history of Malaysia, unfortunately even more can be expected in the years to come. The most recent floods in Kelantan have been recorded as unprecedented in Malaysian history. These flood events resulted in great human, property and environmental losses, along with social disruption and economic upheaval. This situation has called for acute measures from different bodies for post-flood actions, including architectural responses to help victims rebuild their spatial environment.

**Table 1: The flood history in Malaysia including estimates of losses and fatalities.**

Date/Year	Incident	Property, material, crop or other losses (USD)	Number of death
1926	Flood known as 'The Storm Forest' flood	Thousands of hectares of forest destroyed	NA
December 1996	Floods brought by Tropical Storm Greg in Keningau (Sabah)	300 million	241
2000	Floods caused by heavy rains in Kelantan and Terengganu	Millions	15
December 2004	Asian Tsunami	Millions	68
December 2006 & January 2007	Floods in Johor state	489 millions	18
2008	Floods in Johor state	21.19 millions	28
2010	Floods in Kedah and Perlis	8.48 millions (aid alone)	4
2011 & 2012	La Nina in 2011 and 2012 (which brought floods)	NA	NA
December 2014 & January 2015	Floods in Kelantan (the worst), Terengganu and Pahang	228 millions	23

There are 4 significant phases of disaster recovery process (1) immediate response such as providing medicals, food and clean water supply, emergency search and rescue; (2) short term response, where the provision of temporary or transitional shelters are prepared for victims; (3) medium response – identifying beneficiaries and local capacities (4) long-term response – rebuilding permanent houses and resettlement. These levels of process may take up to 5 years. At least 1,827 houses were damaged in the flood disaster that happened in Kelantan in 2014/15. In 1,200 of these houses, the inhabitants were identified as not owning the housing plot for rebuilding and thus needed to be relocated elsewhere in new settlements (Bernama, 2015).

In Malaysia there have been many relocation schemes to cope with the perceived dangers of flooding. Residents are moved from flood-prone areas and resettled in nearby towns where low-cost housing is available. Post-flood development such as resettlement can have major impacts on communities. However, little is known about the long-term effects of such adaptation measures on livelihoods and their success or otherwise in helping to resolve the problems posed by flooding. Hence, this paper revisits the flood resettlement projects created in Kota Tinggi, Johor following the floods of 2006-2007. This paper will discuss what can be learnt from these earlier housing projects that could be relevant to present-day responses to flood disaster.

### **Flood resettlement projects in Kota Tinggi, Johor**

Johor is located in the southern part of Peninsular Malaysia. It is divided into 10 districts, which are in turn subdivided into sub-districts and villages (*Kampung*, or *Kg*). It is surrounded by three of the most important seas in South East Asia, the Southern China Sea, the Straits of Malacca and the Straits of Tebrau. Johor covers an area of 19,095 km<sup>2</sup>, with a population of 3.49 million people (Department of Statistics Malaysia, 2011). It encompasses the longest coastal area in Peninsular Malaysia, which is 400km<sup>2</sup> (ICLARM, 1991).

The series of floods that hit Kota Tinggi, Johor in December 2006 and January 2007 were recorded as the worst flooding in the state due to the unusual monsoon phenomenon (Chan, 2012; Tam, 2014). The research for this paper was carried out in 2014 and 2015 in a resettlement that involved 6 *Kg*, mostly located along the Sungai Johor riverbank in Kota Tinggi.

### **Kota Tinggi then and now**

Kota Tinggi, (see Figure 1 below) the biggest district in Johor, was one of the worst affected areas during the 2006/2007 floods. It covers 3,488.70 km<sup>2</sup> with a population of 192, 220 people. The land on which the city is located is lower in altitude than the surrounding area, creating a valley and waterways, which makes the area more prone to frequent flooding. This has weakened and prolonged the town development (MDKT, 2011). Hence, Kota Tinggi requires detailed development planning in line with its role as the administrative center of the district.

During the flood disaster, Kota Tinggi town area was most affected compared to other places in this district. The water level in the *Sungai Johor* (the Johor River) rose by up to 5.45 meters, resulting in most of the Kota Tinggi town area to be flooded, including places that had not been affected by previous floods. Flood victims were moved to evacuation centers, however, some of the evacuation centers were reported as lacking food supplies due to limited access.

The Johor River is very significant to Kota Tinggi. Shops, schools, religious buildings and houses have all been built near the river. Most of the seasonal events take place along the river, which gives the district an especially strong character in relation to the town.



**Figure 1: Johor consist of 10 districts, surrounded by 3 most important seas; South China Sea, Straits of Malacca and Straits of Tebrau. Kota Tinggi is the biggest district in Johor.**

### **Desa Sejahtera**

The research presented is based on narrative from dwellers in Desa Sejahtera (see Figure 2 below), a new resettlement area that was built to home flood victims who previously lived within the flood plain and vulnerable area; especially those who lost their houses during the flood disaster. Villagers from 6 *Kampung* were moved to Desa Sejahtera (MDKT, 2011), *Kg. Sungai Berangan* (20 houses), *Kg. Tembiah* (120 houses), *Kg. Batu 25* (50 houses), *Kg. Makam* (20 houses), *Kg. Kelantan* (80 houses) and *Kg. Panti* (70 houses). The Desa Sejahtera development is located about 6 to 29 kilometres away from the existing locations of each village and Kota Tinggi town centre. In the year 2012, the Syarikat Perumahan Negara Berhad (State Housing Company Limited) under the Ministry of Finance Malaysia, subsidised the Desa Sejahtera development. 360 units of terrace houses and 10 units of shop lots were built and inaugurated by the former Chief Minister of Johor. Public facilities such as shop lots, a playground, community hall and prayer hall were also provided.

These villages, with the exception of *Kg. Sungai Berangan*, were quite special as they are 'villages within the town', located by the river but within reach of the town centre.

### **Methodology and methods**

The research for this paper has followed a qualitative research approach that focuses on architectural responses to flood scenarios in Malaysia. While environmental problems at a global scale are forcing architects to consider the sustainability of technologies, life-styles and behaviour, at the same time they are confronted with an unprecedented abundance of forms and possibilities. Flood

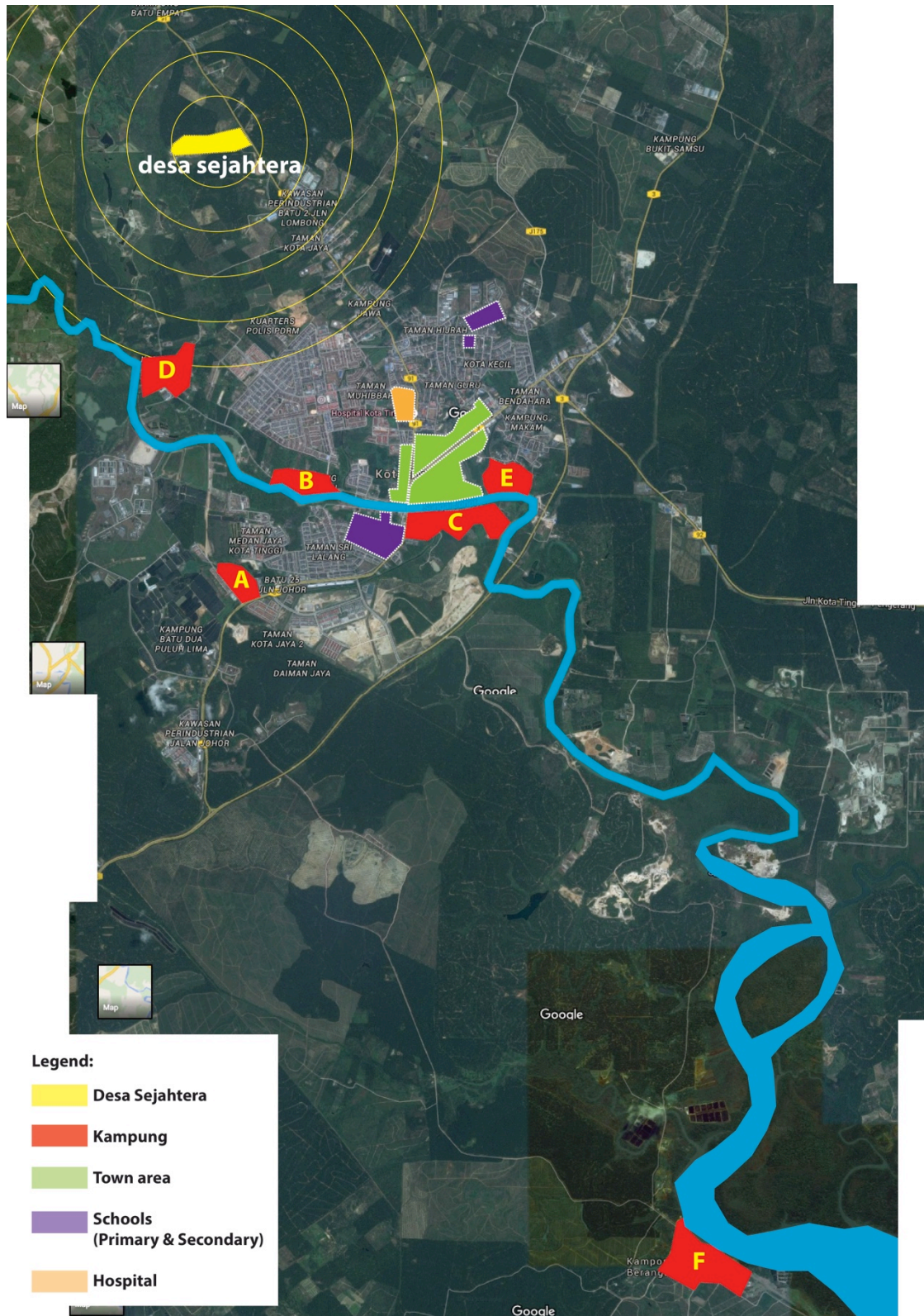


Figure 2: Diagram showing the location of existing *Kampung* (red), *Desa Sejahtera* (yellow) and town area (green). *Kampung* that are involved: (A) Kg. Batu 25 (B) Kg. Kelantan (C) Kg. Tembloh (D) Kg. Panti (E) Kg. Makam (F) Kg. Sungai Berangan.

scenarios and adaptation measures require critical attention from architectural practice  
6-61



because disaster as a result of flooding is predicted to become more erratic. Rosemann (2001, p. 64) states, 'the process of design has become a process of exploration, a process of researching new spatial possibilities and exploring new methodological approaches.' Exploring the issues around flood scenarios and adaptation measures through working with design is a really important aspect of the methodology in this research. The ambition has been to understand the process and implications of architectural production in the context of climate change. The case studies referred to in this paper are important in allowing for an in-depth understanding of the research context of responses to flood disaster during the monsoon season in Malaysia.

In addition to documents on climate change, displacement and resettlement produced by the Malaysian authorities and development agencies, empirical information in this paper is based on data collected during fieldwork between December 2014 and April 2015. Semi-structured interviews were chosen as the main method of data collection as they were considered to be the most effective way of gaining an understanding of the experience of flood disaster and planned resettlement in Malaysia. This was considered to be more effective than asking respondents detailed structured questions about specific issues as some found it difficult to accurately recall information from before the floods of 2006-2007. Eleven respondents were involved. During the interviews, respondents were asked to supply information on basic household characteristics and also on the causes of change in their daily life, and their views of quality of life before and after the floods. The goal of this study was to hear their authentic voices – listening to their stories, insights and experiences about this historical event. For the purpose of the study, respondents were identified based on their *Kampung* of origin and age. It was decided to interview in groups of two as respondents reported feeling more comfortable in the presence of the interviewer this way. This helped to ensure that respondents represented a cross-section of the different *Kampung* communities involved in the study.

Limited by the number of respondents, this study will not be representative of all the villagers and does not aim to provide a general view concerning place attachment, but rather intended to provide a deeper understanding on various insights and experiences on quality of life before and after their shift to Desa Sejahtera and how it might impact their everyday routine and socio-cultural environment.

In this study, fieldwork is understood as 'a form of reality check' (Gabrielsson, 2011, p. 37). The mixture of methodological techniques ensured that information could be cross-checked.

## Findings and discussions

Based on the interviews and observations, this paper focuses on reviewing the case study in terms of three interrelated aspects: (1) respondents' flood experiences and consequences; (2) the difference between the new resettlement housing and original villages; and (3) consideration of aspects of resettlement design for flood victims.

The study interviewed 11 respondents in one individual and five group-interviews who live at Desa Sejahtera (see Table 2 below). Nine respondents (P, R, Z, Y, D1, S1, D2, S2, and J) are aged between 58 to 76 years old and two respondents (K and ID) are aged 43 and 41, respectively. In this paper, respondents were chosen based on their experiences facing with several major floods. Seven of the respondents (P, R, Y, D1, S1, D2 and J) related that they had experienced two major floods in their lifetime, occurring in the year 1969/70 and 2006/07. All of them knew that such major floods rarely happen, however they also thought that there was a possibility that such a major flood event could happen again in the near future and that it is uncertain in terms of flood frequency and the strength of the flooding. Although the floods of 2006/2007 had taken place nearly a decade ago, the flood event was an unforgettable experience for the respondents. After the major flood and until being relocated to Desa Sejahtera, these villagers had become more aware of their surroundings. Whenever the rainy or monsoon season arrived they often had difficulty sleeping as they felt the need to monitor the water level from time to time to make sure that they were safe from flooding.

**Table 2: Respondents demographic information**

No.	Respondents	Kampung (Figure 2)	Age	Occupations
1	P	A	66	House maker
2	K	A	43	House maker
3	R	B	58	Retired (Gov. worker)
4	Z	B	60	Retired (Gov. worker)
5	ID	C	41	Self-employed
6	Y	C	65	Self-employed
7	D1	C	63	House maker
8	S1	F	75	House maker
9	D2	F	76	Retired (Gov. worker)
10	S2	D	63	House maker
11	J	D	65	Retired (Gov. worker)

\* There is no representative from Kg. Makam (E) when conducting the interviews.

Nine of the respondents (P, K, R, Z, ID, Y, D1, S1, and D2) stressed that they

6-63

preferred to stay in their village rather than be relocated to their current housing area. This is because they had lived in houses that had been built by their ancestors and used for generations; hence, they were precious assets for them. 'Kampung' is often described as a special place that has unique characteristics. It creates a sense of place and a sense of belonging which established a strong relationship between the

**Table 3: Summary table of interview responses to general questions about the original Kampung and the new settlement of Desa Sejahtera**

Respondents	Descriptions about flood.	Resettlement	Desa Sejahtera	Place attachment
<b>P &amp; K</b>	Both remembered the date and day of the flood due to one of their family members passing away the day before the flood happened.  After the flood had receded, they are more aware of their environment. They were too worried that the disaster will happen again, every time it rains heavily. They cannot sleep well and keep on monitoring the water level from time to time.	-	Respondent K was happy and thankful that she had been awarded a house although she did not own a house in <i>Kampung</i> .  Desa sejahtera waste management system is better than that in the <i>Kampung</i> .	Preferred to stay in Desa Sejahtera. But missed the <i>Kampung</i> environment.  Respondent K said that it is easier to handle a wedding ceremony in Desa Sejahtera as it has public facilities near to the house.
<b>R &amp; Z</b>	Thinks that the flood was due to global warming and also due to uncontrolled land management and exploitation of land resources	<i>'Some of them who awarded a house in Desa Sejahtera had decided to stay in the Kampung and taking this as a chance for them to get some money by selling the house here..'</i>	No proper organisations to organise the housing community since they moved in.  Location is far from Kota Tinggi town. Shops are yet to be opened.  The layout of the house is the same like the average layout of 1960s house. Lack of cross ventilation and natural lighting	Preferred to stay in <i>Kampung</i> .  Planned to return back to <i>Kampung</i> in two years time
<b>ID</b>	Was reluctant to go to the evacuation	Has no choice to return back	<i>'Sometimes I feel regret that I</i>	Preferred to stay in <i>Kampung</i> .

	<p>centre during the flood disaster. Preferred to stay at home, although they needed to hide from the rescuers.</p> <p>The flood destroyed her house. Not sure where and how to start cleaning the house, right after the flood receded.</p>	<p>to <i>Kampung</i> as her house has been dissembled and the Land and Mines Office took back the land.</p>	<p><i>disassemble my timber house in the Kampung. I don't mind if I am living in poor condition, my house is not as nice as others; but as long as I am happy, that is enough for me. I mean, happy in terms of social relationship with others..'</i></p>	
<b>Y &amp; D1</b>	<p>The big flood was also known as '<i>Air Pasang Keling</i>'</p> <p>Expressed that the flood in 1969/70 was bigger than 2006/07</p>	<p>Have no choice to return back to <i>Kampung</i> as her house has been dissembled and the Land and Mines Office took the land back.</p>		<p>Preferred to stay in <i>Kampung</i> as it is livelier and has many characters.</p> <p>Living cost is cheaper.</p>
<b>S1 &amp; D2</b>	<p><i>'..I just built an attic for my house; hence felt that it is safe to stay during flood. Furthermore, to make sure there's no thief came to my house.'</i></p>	<p>The house in <i>Kampung</i> is still available. If they were given a choice, they would take both houses in <i>Kampung</i> and <i>Desa Sejahtera</i>. And have one of them as a retreat house.</p>	<p>Waste management system in <i>Desa Sejahtera</i> is better. In <i>Kampung</i>, waste was thrown away at other places and they need to manage it themselves.</p>	<p>Preferred to stay in <i>Kampung</i> – able to do planting, and other land-based occupations.</p>
<b>S2 &amp; J</b>	<p>Respondent S2 expressed that that was her first time experiencing a big flood. The first wave in December 2006, she feels funny and can still laugh. However, when the 2<sup>nd</sup> wave of floods happened in January 2007, she felt vary sad and cried for the loss and damage of important stuff.</p>	-	<p><i>Desa Sejahtera</i> is more lively and safe.</p> <p>Had more friends and able to join community activities.</p>	<p>Preferred to stay in <i>Desa Sejahtera</i>. House in <i>kampung</i> was secluded from other villagers.</p>

villagers and their environment. The new settlement of *Desa Sejahtera* did not have the same sense for them.

As a consequence, the respondents reported that there were quite a number of

families that had returned back to the site of the original village, although they were aware that they would be vulnerable to flood events and uncertainty. This is also related to their individual's 'community attachment' (Cross, 2001) that influence their experience in a new setting, as well as their feelings about the place. However, the remaining two respondents (S2 and J) expressed that they preferred to stay in Desa Sejahtera due to their secluded house location from other villagers at their *kampung* and thus feeling unsafe to return back.

It is important to annotate further the differences between the existing *Kampung* and Desa Sejahtera in this study, in order to provide a holistic view of the respondents' experiences of living in both the *Kampung* previously and planned resettlement currently (Table 4).

**Table 4: Differences between the *Kampung* and the planned resettlement based on respondents' observations**

	<i>Kampung</i>	Desa Sejahtera
<b>Management</b>	Each of the villages have their own organisation to manage the village	Lack of proper organisation as 6 villages had become 1 big community
<b>Location</b>	Five out of six villages were located near to Kota Tinggi town. Easy access to public transport and within walking distance.	Location is far from the town, school and market. Lack of public transport (bus available every 2 hours). Thus, limited access.
<b>Economy</b>	Self-sustained and low living cost. Have their own allotments for fruits and vegetables and own their own land.	High living cost. Limited piece of land preventing them from being self-sustained. Shops are not yet open. Therefore, they have to depend on 'mobile shop' for groceries although it is quite expensive.
<b>Socio-cultural</b>	Active social interactions since everybody knows each other. It is easy to greet others.	Passive social interactions.
<b>Safety</b>	Some of the respondents claimed that their village is safe.	Some of the respondents claimed that the new settlement is safer than the village. However, improvements were needed before they could move in, such as adding door and window grills.
<b>Architecture and planning</b>	Traditional timber-house layout is much preferred and comfortable. Trees were an important element that they missed. The houses were built according to specific spatial needs and identity.	Small and limited space. House renovated to fit their spatial needs and identity.

### Rethinking resettlement as flood response

According to the interviews undertaken during fieldwork in Kota Tinggi, there are

4 types of situations that have occurred within the planned resettlement. (1) Some of the people planned to return back to their villages and keep their house in Desa Sejahtera as a retreat for the monsoon season (2) Others stay in the resettlement housing and rent the house in their village or vice versa, (3) Some have sold the house and returned back to the village (4) The house in the village had been demolished by the local council due to it being illegally built on the river reserved area, thus the inhabitants had no other option except to stay in the resettlement area. The study shows that respondents were aware of the risks that flooding posed but nevertheless planned to return to the flood plains or villages in the main because they were unable to establish a viable livelihood in their new location.

Resettlement is a complex process. This is because people that are moving have lived in the village for a long period of time. Some families association with the village stretched over many generations and consequently they felt deeply rooted in their locations. In many ways, living with regular flooding had influenced their historical patterns of intervention and architecture. They also have a set pattern of life which they cherish and reluctant to change (Chan, 1995). Some have engaged with particular self-employed jobs or land based occupation that makes them unwilling to relocate to other places. Such 'involuntary' resettlement to an 'alien' environment involves upheaval of people and livelihoods and may also provoke social disruption. Many attitudes and values of the Malaysian people and their *Kampung* way of life have been acquired over a long period of time. *Kampung* has a broader meaning, which encompasses home, familiar surroundings, relatives and neighbours and is the focus of life and activities, ranging from farming practices, to communal rites, social functions and religious rituals. Resettlement schemes need to take into account the social values and attitudes of *Kampung* residents and the extent to which they can be reoriented towards living in a new place.

As a consequence, there is a need to pay greater attention to these issues when planning resettlements of large numbers of people post-disaster in Peninsular Malaysia. In considering the number of families being relocated to the new settlements in this way, this paper highlights that planning and design plays an important role in gathering communities together. There should be a consideration of the sense of place, a sense of belonging and a sense of values. The paper also suggest that re-housing and resettlement design needs to respond to not only people's needs but also their inherent resourcefulness. Besides that, discussion between the local council and the villagers is needed before proceeding with projects for planned resettlement. It is important to make villagers feel part of the project from the beginning and encourage them to assume the responsibility for taking care of the place. The findings of the research acknowledge Bankoff's (2001) argument that

different belief systems view disasters in different ways and furthermore find many different ways of coping with extreme events – ways that make sense to one culture may be at odds with the plans of policymakers and governments.

This study underlines the importance of ensuring that resettlement communities are socially and economically viable as well as physically robust in an infrastructure sense. Hence, this paper suggests that it is also important to consider ways of reflecting the basic characteristics of the *Kampung* village spatial environment. This would see new resettlement projects accommodate, for example, various cultural activities in gathering areas, provision of allotments for growing crops to reduce living costs and enable the possibility of self-sustainable lifestyles, as well as the creation of smaller resettlement communities for easy organisation of the new village, as well as to encourage active social interactions. Thoughtful design consideration of spatial arrangement of the house is needed to provide a proper and comfortable living space such as passive design approach – day lighting, shading and natural ventilation.

This paper has argued that a more holistic perspective is required to understand the causes and consequences of flooding, displacement and planned resettlement in Malaysia. While projects for resettlement of communities out of floodplains meets both the objectives of development and adaptation measures of governments, there are many ways in which resettlement does not take into account the complex socioeconomic and cultural risks involved.

This study also warns against the way in which a 'dominating construction of climate change as an overly physical phenomenon readily allows climate change to be appropriated uncritically in support of an expanding range of ideologies' (Hulme, 2008, p. 9). Technical responses that view resettlement as an issue of simply providing adequate housing and infrastructure are often tied to political ideas of 'development'. At the same time, they obscure the important indigenous knowledge of adaptation to climate change. This paper thus emphasises the need for greater scrutiny of adaptation measures and at the same time more attention to their discursive and political dimensions. Full awareness of the various impacts of resettlement in Malaysia in the context of climate change is important for architects to understand how it might be possible to both continue 'living with floods' and encourage 'living with resettlement'.

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# Challenging Practice:

## Post-flood disaster assessment in Malaysia

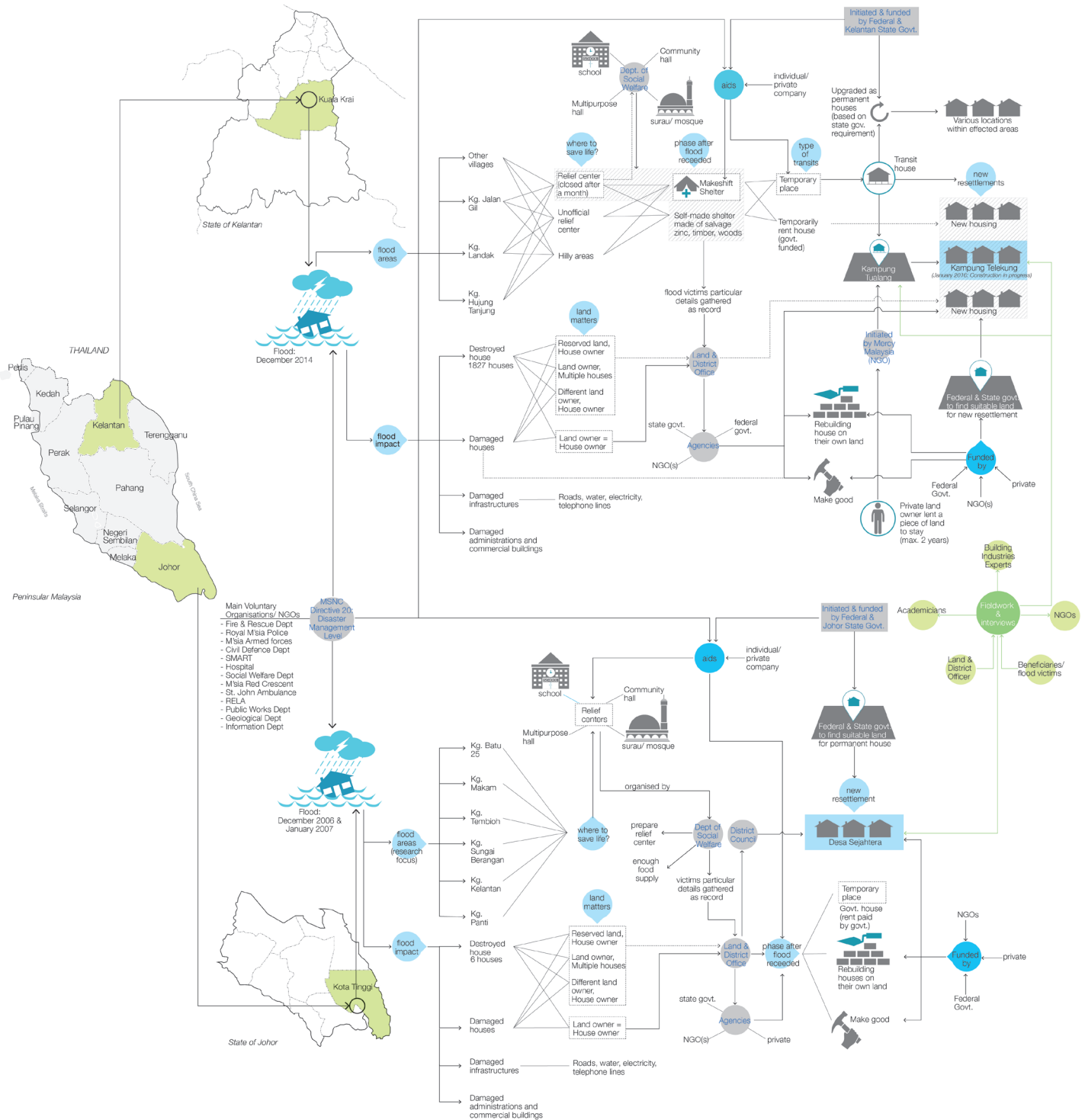
### Introduction

The thought of future associated with climate change is often described as complicated and uncertain. It is generally understood that climate change requires greater adaptability and localise responses. In the case of Malaysia, flood disasters are predicted to become more frequent and uncertain within a climate-changed future. This is particularly concerning with the challenges presented to architectural practice in Malaysia in responding towards adaptation measures from extreme weather impacts.

The Malaysian National Security Council defines disaster as an incident that occurs in a sudden manner, complex in its nature,

causes losses of lives, damages to property or natural environment and has profound effect to local activities.

The study is based on fieldworks conducted in Kota Tinggi, Johor and Kuala Krai, Kelantan between December 2014 and January 2016, at a time that coincides with the Kelantan flood in December 2014; a disaster that was recorded unprecedented in Malaysian history. Thus, this situation calls for acute measures from different bodies and agencies for post-flood actions, including architectural responses to help victims rebuild their life and reconstruct spatial environment.



### Mapping the post-flood events

The research poster maps and outlines the chronology of flood disasters and its aftermath, documented during the fieldworks to represent the various parties involved. Mapping is used as a main tool in the research to understand and compare the frameworks of 'recovery and response' for two different scenarios (Kota Tinggi and Kuala Krai), emphasizes on phases of post-flood events affecting the victims.

Initial review of both scenarios suggests that the post flood framework within Kuala Krai is more complex due to involvement from large groups of private organisations and public agencies, at different phases compared to the case in Kota Tinggi. Therefore, these active participations in Kuala Krai demonstrate an increase level of preparedness and awareness on flood issues and its implications within the local context.



## Chronological study of international scientific narrative.

- 1972, Stockholm, Sweden.  
**The United Nations Conference on Human Environment**  
/ Leads to the establishment of numerous national environmental protection agencies and the United Nations Environment Programme.
- 1979, Geneva  
**The First World Climate Conference**  
/ Concludes that the 'greenhouse effect' from increased buildup of carbon dioxide in the atmosphere demands urgent
- Late 1980s & Early 1990s  
Intergovernmental conferences focusing on climate change held  
/ Together with increasing scientific evidence,  
/ Helped to raise international concern about the issue  
/ Participants : government policy-makers, scientist and environmentalist.
- 1990  
**The Intergovernmental Panel on Climate Change (IPCC) First Assessment Report**  
/ Given mandate to assess the state of existing knowledge about:  
- The climate system and climate change  
- The environmental, economic and social impacts of climate change  
- The possible response strategies  
/ Report confirmed the scientific evidence for climate change  
/ Big impact to policy-makers and general public  
/ Provide basis for negotiations on the Climate Change Convention
- 1992, Rio de Janeiro  
**UN Framework Convention on Climate Change (Earth Summit)**  
/ Signed by 154 states  
/ 20 years after the 1972 Stockholm Declaration first laid the foundations of contemporary environmental policy  
/ The largest ever gathering of Head of State  
/ Other agreement adopted at Rio was **Rio Declaration and Agenda 21**
- 1994, Rio de Janeiro  
**Developed countries submitted national communications describing their climate change strategies.**  
/ INC continues its preparatory work another six sessions to discussed matters relating to commitments, arrangements for financial mechanism, technical and financial support to developing countries, procedural and institutional matters.
- 1995, Berlin  
**The Conference of the Parties (COP-1)**  
/ 117 parties, 53 observer states participated  
/ agreed that **commitments contained in the Convention for developed countries were inadequate** and launched the 'Belin Mandate'
- 1995  
**The IPCC Second Assessment Report** released.  
/ reviewed by 2000 scientists and experts world-wide.  
/ widely known for concluding that, **'The balance of evidence suggests that there is a discernible human influence on global climate'**
- 1997, Kyoto  
**The Conference of the Parties (COP-3)**  
/ Adopted Kyoto Protocol  
/ developed countries agreed to legally binding to reductions in emissions (greenhouse gasses).  
/ The Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP) was established to develop a protocol, with legal force under the Convention, applicable to all Parties. The ADP is to complete its work as early as possible, but no later than 2015, in order to adopt this protocol, legal instrument or agreed outcome with legal force at the twenty-first session of the Conference of the Parties and for it to come into effect and be implemented from 2020.
- 1998, Buenos Aires  
**The Conference of the Parties (COP-4)**  
/ Agreed two-year Plan of Action for completing Kyoto rulebook.
- 2000  
2000  
/ submitted **Malaysia's Initial National Communication (INC) to UNFCCC**  
/ contain the national Greenhouse Gas (GHG) inventory for a specified year as well as a record of activities undertaken to address the issue of climate change
- 2001  
**The IPCC Third Assessment Report** released  
/ report concluded that the evidence for humanity's influence on the global climate is now stronger than ever before, and it presented the most detailed picture to date of how global warming will affect various regions.
- 2007  
**The IPCC Fourth Assessment Report** released  
/ It produced the **Copenhagen Accord**, endorsed continuation of Kyoto Protocol. **Sets mitigation target at 2 degree celcius.**
- 2009, Stockholm  
**The Conference of the Parties (COP-15)**  
/ It produced the **Copenhagen Accord**, endorsed continuation of Kyoto Protocol. **Sets mitigation target at 2 degree celcius.**
- 2010, Cancun, Mexico  
**The Conference of the Parties (COP-16)**
- 2011, Durban, Africa  
**The Conference of the Parties (COP-17)**  
/ Theme, 'Working Together Saving Tomorrow Today'  
/ Established Greening Programme with the goal of hosting a low carbon event as well as minimising the events' ecological footprint
- 2012, Doha, Qatar  
**The Conference of the Parties (COP-18)**  
/ Governments have **agreed to speedily work toward a universal climate change agreement covering all countries from 2020, to be adopted by 2015**, and to find ways to scale up efforts before 2020 beyond the existing pledges to curb emissions so that the world can **stay below the agreed maximum 2 degrees Celsius temperature rise.**
- 2013, Warsaw, Poland  
**The Conference of the Parties (COP-19)**
- 2014  
**The IPCC Fifth Assessment Report** expected to be released

### Malaysian government action

2000  
/ submitted **Malaysia's Initial National Communication (INC) to UNFCCC**  
/ contain the national Greenhouse Gas (GHG) inventory for a specified year as well as a record of activities undertaken to address the issue of climate change

2009, The COP-15, Stockholm, Denmark  
/ The Prime Minister of Malaysia, Najib Razak, delivered Malaysia's proposal to reduce its CO2 emission's to 40 per cent by the year 2020 compared with its 2005 levels, subject to assistance from developed countries.  
/ Shifting Malaysia towards a path of low-carbon sustainable development

2011, The COP-16, Cancun, Mexico  
/ Established **National Green Technology and Climate Change Council - for emission reduction program (40% by 2020)**

2011, The COP-17, Bonn  
/ Malaysia is doing its part to combat climate change - **with limited financial, technological and human capacity resources at its disposal.**  
/ **Implementing necessary adaptation measures to address changing rainfall patterns and extreme weather events.**

2012  
/ Department of Environment under Ministry of National Resources and Environment **submitted Malaysia's Second Initial National Communication (INC) to UNFCCC**

### Malaysian building industry & architecture.



Organisations/Agencies that are responsible for building industry and architecture in Malaysia. From left: Public Work Department, Malaysian Institute of Architects, and Green Building Index 3rd. Blvd.



A total of 216 was registered with GBI, 44 buildings were GBI certified and 172 are waiting for design assessment. (Source: Green Building Index, 2011)

2009 - Introduced **Green Building Index (GBI)**  
/ Developed **specifically for the Malaysian-tropical climate, environmental and developmental context, cultural and social needs** by Malaysian Institute of Architect  
2009 - Ministry of Science, Technology and Innovation  
/ Produced **Climate Change Scenarios for Malaysia (2001-2099) Scientific Report** by Malaysian Meteorological Department.

2011 **Green Building Index Tool**  
/ **44 buildings** provisionally GBI certified  
/ **172 buildings** registered and awaiting design assessment.  
/ **All office should be no cooler than 24 degrees Celcius.**

2011 - 2015 **Building Sector Energy Efficiency Project (BSEEP)**  
/ Goal - reduce the annual growth rate of GHG emissions from the Malaysia buildings sector.  
/ Improve EE in Malaysian buildings - by promoting the energy conserving design of new buildings and by improving EE in the operation of existing buildings.  
/ Aimed at improving EE and promoting the widespread adoption of EE building technologies and practices in the Malaysian

2013 Introduced **Green Rating Tool**  
/ By the Public Work Department, Ministry of Public Work.

## Background

Keywords:

Climate Change, Malaysia, Built Environment, Narrative

Research about climate change has leads to sustainable development. There is a great concern of climate change from the scientists community, hence, has lack of voices from the social scientists. This research aims to explore this issue through the international agreements and national actions that focused to building industries and architecture.

# Climate Change

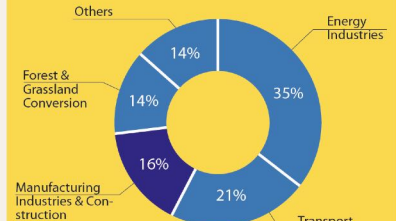
## From International Agreement to National Action: The case of Malaysia and Architecture

Malaysia

### Why architecture?

Buildings are among the major contributor to carbon emissions. In the year 2007, building sector in Malaysia represent 16 percent of carbon emissions, after the energy and transport sector.

Research shows that discourse emerging from institutions such as the IPCC displays different narrative properties and is less conducive to narration by others outside organization. Hence, failed to make much of an impact on group of people in building industries.



Major source on carbon emission in Malaysia, year 2007. Source: Ministry of Natural Resources & Environment (2012)

### How?

Architects are responsible to help reducing carbon emissions in building sector. As people spend more time in buildings - working and sleeping, the narrative should be more commonplace in order to understand how do architecture and architects address sustainability in design.

This chronological study of the international and national narrative reveals the sustainable development patterns. It is then analysed specifically to actions taken within architecture sector in Malaysia. This study will be the basis to explore architects understanding of sustainable architecture in Malaysia.

References:  
(1). United Nation Framework of Climate Change, 2013 (2). Intergovernmental Panel of Climate Change, 2007 (3). Minister of Natural Resources & Environment, 2012 (4). Minister of Public Department, 2013 (5). Green Building Index Malaysia, 2012.