



UNIVERSITI PUTRA MALAYSIA

***CULTURAL EVALUATION AND FLOOD MANAGEMENT
RECOMMENDATION FOR LOCAL SETTLEMENT IN MITIGATING
FLOOD DISASTER IN KELANTAN RIVER BASIN, MALAYSIA***

MUHAMMAD LUTFI BIN DAUD

FRSB 2018 20



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By

MUHAMMAD LUTFI BIN DAUD

**Thesis submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Master of Science**

March 2018

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Dedicated to:

Those who have aided me throughout the study

*My beloved parents
My cool **Father** and caring **Mother***



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UPM

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment
of the requirement for the Degree of Master of Science

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March 2018

Chairman : Associate Professor Nangkula Utaberta, PhD
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Recent huge flood on last December 2014 that affected east-coast of Malaysia, especially Kelantan has disrupted and caused big damages to the local community physically and mentally. The 2014 flood is believed as the largest and uncontrollable recorded flood in the history of Kelantan. Thus, this research is being conducted in order to identify lifestyle changes experienced by Kelantan community during before and after the enormous flood event. The study intends to compare existing flood procedure with other countries before proposing the new settlement aid based on the cultural analysis and consideration. In order to conduct the research, this study has done content analysis and evaluated opinions from previous researchers regarding the flood incidents in Malaysia focusing the events in Kelantan. Qualitative interview has been constructed and done with the experts and professionals whom directly involve in mitigating the flood disaster in last 2014. They have been helping in validating the data collected from the site visit. The research results are able to show the lifestyle changes before and after the flood among the locals and a proper cultural framework of Kelantan community will be constructed. Later, the framework will be beneficial in mitigating the flood disaster especially in term of settlement aids. This is important in order to understand the effect of disaster upon culture of a community, which directly able to increase the preparedness of that particular community to face the upcoming disaster again

Abstrak tesis yang disampaikan kepada Senat Universiti Putra Malaysia bagi memenuhi keperluan untuk Ijazah Master Sains

**PENILAIAN BUDAYA DAN CADANGAN PENGURUSAN BANJIR UNTUK
PENEMPATAN SETEMPAT DALAM MENANGANI BENCANA BANJIR DI
KELANTAN, MALAYSIA**

Oleh

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Mac 2018

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Banjir besar pada Disember 2014 lalu yang menimpa pantai timur Malaysia, khususnya Kelantan telah menyebabkan kerosakan besar kepada komuniti setempat secara fizikal dan mental. Banjir 2014 dipercayai banjir terbesar dan tidak terkawal dalam sejarah Kelantan. Kajian dijalankan untuk mengenalpasti perubahan gaya hidup yang dialami masyarakat Kelantan sebelum dan selepas banjir besar. Kajian bertujuan membandingkan prosedur banjir yang ada dengan negara lain sebelum mencadangkan bantuan penyelesaian baru berdasarkan analisis dan pertimbangan budaya. Untuk menjalankan penyelidikan, Anlisa kandungan dan menilai pendapat daripada para penyelidik terdahulu mengenai kejadian banjir di Malaysia yang bertumpu di Kelantan telah dilakukan. Wawancara kualitatif telah dilakukan dengan pakar dan profesional yang terlibat secara langsung dalam mngharungi bencana banjir pada 2014. Mereka membantu mengesahkan data yang dikumpul dari lawatan tapak. Hasil kajian dapat menunjukkan perubahan gaya hidup sebelum dan selepas banjir pada penduduk tempatan dan rangka kerja kebudayaan masyarakat Kelantan yang sesuai akan dibina. Kemudian, rangka kerja akan memberi manfaat dalam mengurangkan bencana banjir terutama dari segi bantuan penyelesaian. Ini penting untuk memahami kesan bencana terhadap kebudayaan komuniti, secara langsung meningkatkan kesediaan komuniti untuk menghadapi bencana yang akan datang.

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Muhammad Lutfi Bin Daud

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CHAPTER 1

INTRODUCTION

1.1 Background of The Study

In the review and readings from a variety of sources and literature, attendance and frequency of rainfall in Malaysia is located on the Equatorial Zone is not uncommon. Wind northeast monsoon brings heavy rains to the states on the East Coast and also to Sabah and Sarawak. As before, this rain will fall heavily for several days continuously, thus causing floods like the flood that occurred in 1967 and 1971. In the history of the frequent floods in the country, including in 1931, 1947, 1954, 1957, 1967 and 1971. Massive flood in 1926, 1967 and 1971 are said to happen due to weakness drainage infrastructure could not cope with the lack of rain in the large quantity. If physical development is the reason for the flood in 1926, 1967 and 1971; In general, the average public also blamed the unbalanced development as the excuse to flooding that occurred in 2014.

This claim is consistent with the memory of scholars and academics as ever mentioned by Mr. Syed Hussain Pah Bar Council of Universiti Utara Malaysia in his paper entitled "Implications of Socio-Economic Evaluation of Flood Basin Kelantan and also a paper entitled "Development of Flood Plain undertones Valley, Kelantan : Issues and Challenges " by Mariney Mohd Yusoff, a senior lecturer in Geography from the University of Malaya, both researchers discussed the shortcomings of development in Kelantan.

A team headed by Barzani Muhammad Gasim from Universiti Kebangsaan Malaysia also relate to flooding that occurred between December 17 until December 19, 2006 in Segamat, Johor with changes in land use is rampant and without monitoring. The floods are likely related to the effects of changes in land use, drainage conditions are not maintained as well as the climatic conditions. The proposed retention of forest reserves, regulatory changes in land use, upgrading the drainage system, avoid development in low-lying areas should be considered by the authorities in Johor

Whereas, In the opinion of L. Enrico (Henry) Quarantelli, from the Disaster Research Center, University of Delaware as much a sociological study the effects of the disaster, said there is a big difference between catastrophe and disaster. He gave six differences to explain whether it was a disaster. The disaster happened when, in his first public structure which include shelters, emergency relief organizations and the hospital are unable to operate during a disaster occurrence. Second, when a disaster happens, local authorities failed to carry out its task and emergency aid can only be delivered when the process of recovery after the disaster struck. Third, help from nearby communities (in this case from outside Kelantan) failed rushed to the disaster site immediately. Next, the fourth, we know it's not a disaster, but a disaster when the people fell sharply

and interrupted for a long period. In this case, the public will have absolutely failed to return to the original situation such as schools, businesses, estates and others in the short term. This means that members of the public would be preoccupied by the management of post-disaster before it can return to normal. In addition, when a disaster, basic facilities like electricity, water and communications were cut to mark the affected community as a whole.

Fifth, when a disaster is being widely covered by the mass media, including at the international level. The flood disaster in Kelantan was the international mass media attention when the incident draw many media attention from all over the world. Last but not least, sixth, according Quarantelli , once a disaster occurs usually top political leaders will be visiting. Large or small disaster can be measured when people ignore the presence of political leaders but they are denounced or criticized, either face to face, or behind. In other words, the symbol of their presence as a 'symbol of soliciting political figures' is no longer considered necessary or relevant by the public as they are going through pain and suffering far greater.

Based on the definition and Quarantelli view of the above, it is clear the massive flood on the East Coast, especially Kelantan is not an ordinary disaster (disaster) but is actually a catastrophe or in its Malay-language disaster (bencana) that has impacted the concrete structure, mental and physical of Kelantan community.

Disasterous Flood 2014 : *Bah Kuning*

Kelantan experiences flood annually. To the people, flood is a water festival where they enjoy the overflowed water by making raft and swim. However, on the other side, there is more urgent concern to look into which are the issues regarding the incident. There are two main issues that may be associated with the annual phenomenon. First, Kelantan topography which consisting of a labyrinth of rivers which act as the main source of water. Also, the climate and period of the monsoon time of year that always experience the monsoon accounts for the total quantity of heavy rains.

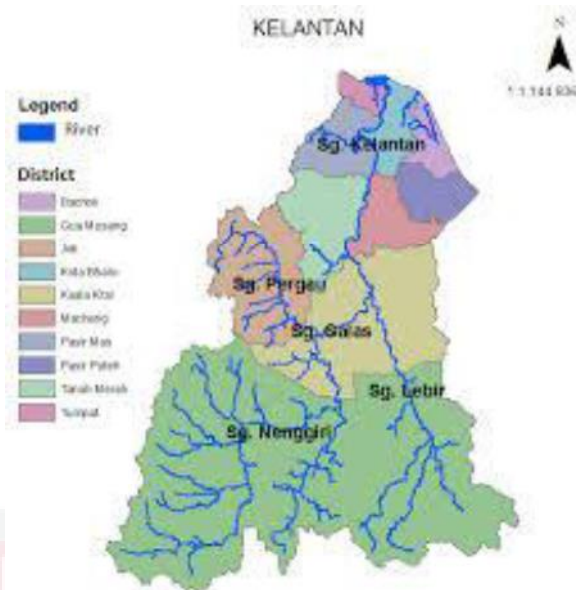


Figure 1.1: Rivers in Kelantan (Source : ieeexplore.ieee.org)

There are debate ongoing regarding the big disastrous flood in Kelantan 2014. The researchers are questioning about the main cause for the extreme flood either it is due to the occurrence of heavy rains descended above the norm compared with the previous flood season or otherwise.

According to the e-Kelantan Flood, First heavy rainfall started from 17 to 19 December, The rain volume was high on December 17, in Jeli, Kusial / Tanah Merah, Kota Bharu, Jenob / Tanah Merah, Rantau Panjang and Pasir Puteh. While the measure of the rainfall at other areas recorded greater than 100 mm except at the Kelantan river bank. The reading on the 17 December of the whole syllabus in Kelantan was 2,596 mm. As a result, on December 18, more than 80 percent of the Rantau Panjang flooded when the water level rise above the danger in Sungai Golok. After that, there was the second wave of rainfall , particularly in Mount Gagau, Cave Weasel (from December 21 to 24). Within in four days, 5,832 mm rainfall was recorded at Mount Gagau.

December 23

According to the e-banjir Negeri Kelantan, flood recorded in the rain descended in Mount Gagau on 23rd December is 515 mm. This is an unusual phenomenon than on the same date listed on the Kuala Krai, namely in Dabong 154 mm and 164 mm tramp. Derivatives of heavy rain has flowed into the river Sungai Badong Pertang and the prevailing strong currents and rapidly (due to large quantities of water from the top of the mountain) has hit not only the plot but also valleys and plains houses. Then the flood also hit the river valley Lebir (overflow entire bank) and strikes all the main valley up to the Kelantan River (beginning) in Kuala Krai. On the same day in tethering Department, Kota Bharu recorded at 5:57 danger level meter.

Events of heavy rain and swift river currents have also been linked to the topography and the absence of physical construction. This was because during the course of the river Lebir there has been no large reservoir. It is found along these rivers flow (before entering the Kelantan River channel) it does not have any lakes or large water storage reservoirs like Lake Pergau, in Jeli. The situation is different in Rajasthan that has Kenyir Lake in Terengganu and has Tasik Bera and Lake Chini to support the overflow water. Thus extreme large flood happened.

Thus when the flood hits Kelantan at the end of December 2014, it involves all regions, except Bachok and Pasir Puteh which only experience small effect during the first wave. While the bank of rivers in Kuala Krai and Pasir Mas have been flooded quite largely, called by some the class disaster.

Views on kelantan flood

The causes of the massive flood are still being investigated, anyhow Mariam Mokhtar says in Malaysia today (2015),

“The reason for the flooding in Kelantan is not just the extensive logging, nor is it God’s wrath or climate change or political bodies. The real reason for the disastrous floods in Kelantan is decades of neglect and under-investment by the government – both state and federal. It is also the people’s lack of will to force Putrajaya to provide the badly needed national funds to build flood defences and develop the state.”

On contrary, it is undeniable floods are natural disasters. It is part of a test of Allah S.W.T. For believers of any kind of test which comes from Allah S.W.T will make them more confident and cautious.

Allah S.W.T. commands in Surah Surah Al-Ankabut verses 2-3,

“Do men think that they are left alone to say, “ We believe ”, whereas they are not tested? And verily We have tested those before them, Allah knows those who really and surely He knows people that is a lie. ”

However, we as a caliphs of Allah S.W.T. , should not be giving up trust in fate. We should do everything reasonable measures for dealing with any form of disaster or tests that afflict us. In the context of a larger scale disasters such as the flooding that was struck in several states today, then disaster management will be managed by the government through various disaster management agency. (Ayop Mohd Abd Razid, 2015)

During the flood disaster occurred, in terms of physical destruction and material life but who 'corrupted' can not be calculated and viewed with the naked eye. The application of the old culture and religious education have helped the people of Kelantan in managing stress in dealing with this tragedy. The prayers of their in ancestors and also respect addition to the high religious scholars have spared them from getting down their emotional life. People of Kelantan accept this as an unfortunate fate and patience that makes community resilient.

Having examined all the arguments and opinions of the discussion above, it outlined three main goals of this study; The cultural changes among the local people in Kelantan experienced before and after the flood, The cultural considerations taken by the higher authorities in providing settlement aids to the victims and failure procedures of the flood management to supply fast action of recovery. The study will benefit in improvement of safety and sociodemographic studies for a more friendly settlement flood. Also, this study is significant for preparing the country to be better prepared to face the floods in the future.

In simply word, what has happened in Kelantan during December 2014 is a major disaster that cannot be underestimated at all. The initial observations of the impact of culture should be weighed, and evaluated immediately accessible so that the public be well-understand about the actual situation. It is important that the government recognize the fundamental rights of citizens affected by the disaster by giving or paid their rights in order to avoid instability and long-term imbalance in the society.

1.2 Problem Statement

As has been discussed, Kelantan experienced flood annually. Despite of frequent occurrence of the event in the Kelantan river basin, local community is still projecting dissatisfaction towards the ineffectiveness of flood management procedure. The efficiency of flood management system is essentially vital as it influences two crucial elements; the safety of human lives and property damages and losses. If the government is practicing proper and effectual flood management system ; before, during, and after flood occurrence, the extent of loss or damages of human lives and properties can certainly be incrementally reduced (Vari, 2002).

Kelantan and flood are two inseparable components due its significant frequency in that state. The flood occurrence causes losses and damages to properties and many lives. One of the main factors for the high number of flood event in the state is because to large-scale land clearing activities for commercial agricultural purposes such as for rubber and oil palm estates (Tuan Pah Rokiah, 2010). The total area of land use such as forest, rubber and oil palm indicates that there is a big annual change as most lands are utilised for commercial agricultural activities. From the year 1961 to 2006, Kelantan River Basins have experienced flooding for a total of 275 times at early warning level, 92 times at warning level and 23 times at dangerous level (Tuan Pah Rokiah, 2010). The same situation also exists for other sub-basin regions such as Lebir, Galas, and

Pergau which stated great increment in flood frequency and magnitude. This scenario illustrates that higher flood risk tendency if respected authorities pay less attention on the mitigation measures including flood management system especially for the three stages of before, during, and after flood occurrence. Unwanted events such as loss of properties, lives, and spreading of infectious diseases can certainly be avoided if proper measure are being taken into account.

Annually, structural engineering approach is the common element that has been paid major attention at time of flood disaster incident. The disaster oftenly being evaluated and study from the technical context however, this approach is found to be less effective in tackling human related flood issues or problems (Chan, 1995). According to Chan (2009), flood occurrence is closely related to human factor, therefore, the best approaches to solve flood problem should also be non-structural (humanity-based). Chan (2010) later added that the importance of this non-structural approach must be again emphasized through the concept of environmental humanities. Equally, according to Levy et al. (2005) the proposal for Disaster Support Systems (DSS) is a non-structural approach introduced to improve the planning and effectiveness of flood management. Among the important elements of DSS are communication, knowledge transfer, skill improvement in forecasting ability and the transparency of strategic flood decision management. In addition, the study by Vari (2002) at Lower Tisza found that the forms of flood control is not necessarily needed to be informed but it is important that the public be informed of the level of risks associated with flood in order to avoid a panic situation in the local community.

On the other hand, Study in Vietnam interestingly found that the effects of doi moi policy really provide much of awareness to the community in order to embrace the flood disaster by building more durable housing, building home in stages using better resistant building materials. Up to the year 2005, there was 17 percent of houses built using more durable materials, 65 percent using semi durable materials and 18 percent still using less durable materials (Tran et al. 2009). According to Warner (2008), efficient flood management system requires a close cooperation by each level of the community, private sector and local leaders. These groups should not be left out in enduring major flood disaster rather they should form line in the front in helping the flood victims.

Systematic planning in flood management system reflects proactive cooperation among relevant parties in preparation for flood disaster. Thus, government has to consider about the level of settlers' satisfaction to current flood management systems namely before, during and after floods materialization. With such prudent actions, it can certainly assist flood victims in the preparation of any flood disaster especially to those who resides in more vulnerable flood-prone remote/interior lowlands. It is crystal clear that the local residents or the community are still not satisfied with the flood management system. Therefore, the government should improve several aspects of the flood management system focusing other than technical aspect especially before the flood such as accuracy of information delivery techniques, effectiveness of earling warning system, time interval for disaster announcement and time interval for actions.

And for the period after flood, the government should be sensitive to the timely repairs public facilities and improvement on safety and security monitoring.

In agreement to the statements, the study aims to unravel some of the initial problems that arise in the context of the review of floods that hit Kelantan in 2014 ago. As already discussed, the definition of culture must be first peeled in more detail. The study and comparison between the cultures of other people must be given full attention in order, the result could be a yardstick for the real culture of the community in this eastern country. As has been mentioned earlier that the problem of multiple studies that have been done before further emphasize other elements such as security, medical and so on without taking into account culture in a settlement during disasters. This study wanted to see the local culture and its relationship to disasters between before and after the incident. The study will be focusing on the cultural changes that the locals experienced throughout the tragedy. As the Imam of the Kuala Krai mosque has emphasized on the drastic changes of the community whom have greatly at lost after the tragedy. The common flood which normally being celebrated annually has put the majority of local people in Kelantan in bad state mentally and physically. Thus, Ratings culture of observation and analysis needs to be done to measure the value of culture in association with floods.

This study is expected to be able to give a positive result in contributing safer flood management procedures that is better and closer to the local communities themselves. This is because existing safety procedures still failed to help the flood victims in total. When compared to the catastrophic situation before and after, our country is still far behind in terms of efficiency and channel assistance given over than other countries. It is clear, showing the current disaster safety procedures should be enacted and more detailed attention in order to safeguard the welfare and safety of the people in the future.

Further, the study wanted to see and compare the placement of victims involved. Studies and observations of settlements that will drift away to be studied in identifying weaknesses in the design and improve the new disaster settlement model. The construction of the new settlement that takes cultural factors must meet the demands of flood friendly houses according to local culture. As Raja Shamri strengthened the statement by saying that the provided disaster settlement do not provide soul of the people within the houses. Placement shall be constructed on the basis of strength and is in a strategic location as well. This is because the existing settlements are seen to fail resisting the flood that hit Kelantan recently.

1.3 Research questions

This research will be conducted based on some identified questions or problems as discussed below. The questions have been derived from the discussion and agreements of opinion as been mentioned. In short, the research problem is focused on the cultural

changes experienced by the Kelantan community and how the changes can benefit to a better flood management procedure and settlement aids to the victims.

Sub research questions are:

1. What are the cultural changes experienced by the local community in Kelantan before and after tragic flood disaster 2014?
2. What are the cultural and safety factors that have been considered by procedure from other countries which can be implemented in the flood management procedure applied in Kelantan?
3. How the cultural consideration taken by the higher authorities in providing the disaster settlement could be beneficial to the victims in Kelantan?

1.4 Research Objectives

The goals of this research are:

1. To identify the cultural changes experienced by Kelantan community before and after flood disaster 2014.
2. To analyze existing flood management procedures by making comparisons with procedures in other countries with disaster safety approaches.
3. To propose design framework of the new disaster settlement based on the cultural analysis and considerations for the flood victims.

1.5 Scope of research

This study will focus on the cultural changes of Kelantan community during before and after the flood disaster and the cultural considerations of new disaster settlement aids for the flood victims. Thus, the scope of the research will be confined within the boundary of identifying the cultural changes to the local community in Kelantan before and after the flood disaster 2014. Important to be kept in mind that the research scope are done within the objectives mentioned above in order to improve the current safety procedure and propose a local cultural settlement for victims of the flood.

Following process will be adopted to conduct the research :

- a. Identifying the changes faced by the local Kelantan community before and after the huge flood incident 2014 form the aspect of culture.

- b. Analyzing the cultural and safety elements considered in a safety flood management in other countries i.e. Thailand, Japan and United Kingdom
- c. Proposing the framework of the new disaster settlement aids based on the cultural considerations for a safer settlement in order to conserve the local culture of the Kelantan community.

As stated in previous section, this thesis will relate most specifically in Kelantan. Research will be drawn from this area and conclusion will relate primarily to the region.

1.6 Methodology

The methodology used in this research is divided into three (3) ways:

1. Qualitative content Analysis, through the study of grey documents and literature on various writing about defining culture of Kelantan are being well discussed. Apart, finding from the case study of safety procedures disaster from foreign countries such as Thailand, United Kingdom and Japan and a detailed review of the improvement element from all aspects of quality improvement resilience to face future flood data.
2. Focus Group Discussion among the experts and professionals which have been held in Universiti Malaysia Kelantan (UMK) and Universiti Putra Malaysia respectively upon an open-ended discussion regarding the flood. The invited speakers are asked and required to thoroughly elaborate on the flood issues and suggestions.
3. experts interview, the study has been furthered carry with validation of information regarding the flood by detailed outputs from the experts that involved directly in aiding the incident. The interview which has been made at the flood-affected areas in Kuala Krai and Pasir Puteh are purposely carried out for validation process and recommendation.

1.7 Structure of the study

The discussion of this research will be divided over seven (7) sections begins with a chapter that will cover an introduction, background, problem statement, purpose, methodology and discussion of the scope and structure of this study.

Chapter two will present and identify the wealth and diversity of cultures. This chapter will explain the factors that contribute to the uniqueness of the Kelantan.

The third chapter will be the construction for conceptual framework derived from the study cases.

Next, in chapter four, the methodology of the research are explained in detailed manner.

Chapter five is more focused on the data finding of the study of mentioned objectives ; namely the cultural changes among the Kelantan community, the flood management procedures and new disaster settlement.

Chapter six discusses the comparison between security procedures disasters of our country and other developed countries with the aim to find differences and similarities between the procedures. Also, the analysis of culture considerations will be carried out to identify implementation aspects of local culture on the new placement.

The final chapter that is, about the seventh will conclude the review and listing suggestions and recommendations that can be made in the future.

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