

**IDENTIFYING KEY CRITERIA OF THE PHYSICAL
FACILITIES FOR AN EVACUATION CENTRE FOR
FLOOD VICTIMS**

BY

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degree of Master of Science (Built Environment)**

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ABSTRACT

Malaysia has been experiencing many natural disasters such as floods, landslides, earthquakes and droughts, which resulted in damaging the properties and causing casualties. The most disastrous was in 2014 during the biggest flooding affecting over 36,128 families in East Coast of Malaysia particularly in Kelantan. During disaster events, public buildings such as schools, community halls and religious buildings, including mosques have been used as evacuation centres in Malaysia to place the flood victims. Many studies identified that the flood victims had experienced many problems and discomfort with regards to physical facilities and amenities. These include improper sleeping area, cleaning and washing facilities as well as the needs for privacy for the flood victims. The aim of the research is to establish the key criteria to achieve the most appropriate and suitable physical facilities as well as meeting the psychological needs of the victims of natural disasters. The research begins with the review of the physical facilities requirements for appropriate and suitability as evacuation centre. Assessments on the components of the physical facilities for the existing evacuation centres are conducted. The research adopted a qualitative approach where data were collected through observation and interviews. Secondary data through literature analysis to examine the study's theoretical context. Three case studies in Kelantan were selected in Kelantan namely Veteriner office, Kuala Krai, Sekolah Menengah Kebangsaan Keroh, Kuala Krai and Sekolah Menengah Kebangsaan Agama Lati, Pasir Mas. Comparative analysis were carried out to evaluate the existing evacuation centres taken as case studies. The research found that the basics physical facilities (with appropriate size, spaces and specifications) should be provided to be considered as evacuation centre. Thus, this research is an attempt to propose the criteria of physical facilities for evacuation centre. It is believed that the most appropriate and suitable physical facilities and amenities for evacuation centre would be able to meet the well-being of the victims that include not only comfort but privacy as well to achieve rehabilitated environment for the flood victims in Malaysia physically, psychologically and mentally.

ملخص البحث

تعرضت ماليزيا للعديد من الكوارث الطبيعية مثل الفيضانات والانهيارات الأرضية والزلازل والجفاف، مما أدى إلى إلحاق الضرر بالمتلكات والتسبب في وقوع إصابات، كانت الأكثر كارثية في عام 2014 خلال أكبر فيضانات أثرت على أكثر من 36128 أسرة في الساحل الشرقي لماليزيا ولا سيما في كيلانتان. خلال أحداث الكارثة تم استخدام المباني العامة مثل المدارس والقاعات المجتمعية والمباني الدينية بما في ذلك المساجد مراكز إجماع في ماليزيا لإيواء ضحايا الفيضانات. حددت العديد من الدراسات أن ضحايا الفيضانات قد عانوا من العديد من المشاكل وعدم الراحة فيما يتعلق بالمرافق المادية ووسائل الراحة، وهي تشمل منطقة نوم غير لائقة، ومرافق للتنظيف والغسل، بالإضافة إلى احتياجات الخصوصية لضحايا الفيضانات. الهدف من البحث هو وضع المعايير الرئيسية لتحقيق أنسب المرافق المادية وأنسبها، وكذلك تلبية الاحتياجات النفسية لضحايا الكوارث الطبيعية. يبدأ البحث بمراجعة متطلبات المرافق المادية لملاءمتها في حال استخدامها لإيواء الضحايا. يتم إجراء تقييمات على مكونات المرافق المادية لمراكز الإخلاء الحالية. اعتمد البحث نهجا نوعيا؛ حيث تم جمع البيانات من خلال الملاحظة والمقابلات. أما البيانات الثانوية فقد تم الوصول إليها من خلال تحليل الأدبيات ومراجعة السياق النظري للدراسة. تم اختيار ثلاث دراسات حالة في *Kelantan*، وهي: مكتب *Veteriner*، *Kuala Krai*، و *Sekolah Menengah Kebangsaan Keroh*، *Kuala Krai* و *Sekolah Menengah* *Pasir Mas*، *Kebangsaan Agama Lati*. تم إجراء تحليل مقارنة لتقييم مراكز الإخلاء الحالية التي تم اعتمادها لتكون دراسات حالة. وجدت الدراسة أنه يجب توفير المرافق المادية الأساسية (ذات الحجم والمساحات والمواصفات المناسبة) ليتم اعتمادها مراكز للإخلاء. ومن ثم؛ فإن هذا البحث هو محاولة لاقتراح معايير المرافق المادية لمراكز الإخلاء. من المعتقد أن المرافق المادية الأنسب والأكثر

ملاءمة ستكون قادرة على تلبية احتياجات الضحايا التي لا تشمل الراحة فحسب؛ بل الخصوصية أيضًا لتحقيق بيئة مؤهلة لإيواء واستيعاب ضحايا الفيضانات في ماليزيا جسديًا ونفسيًا وعقليًا.



APPROVAL PAGE

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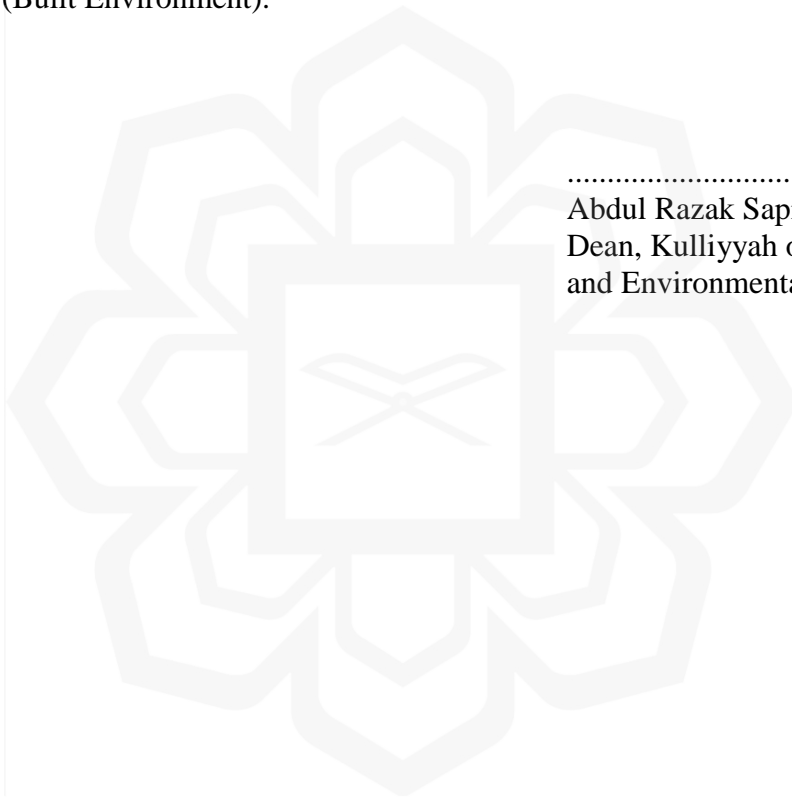
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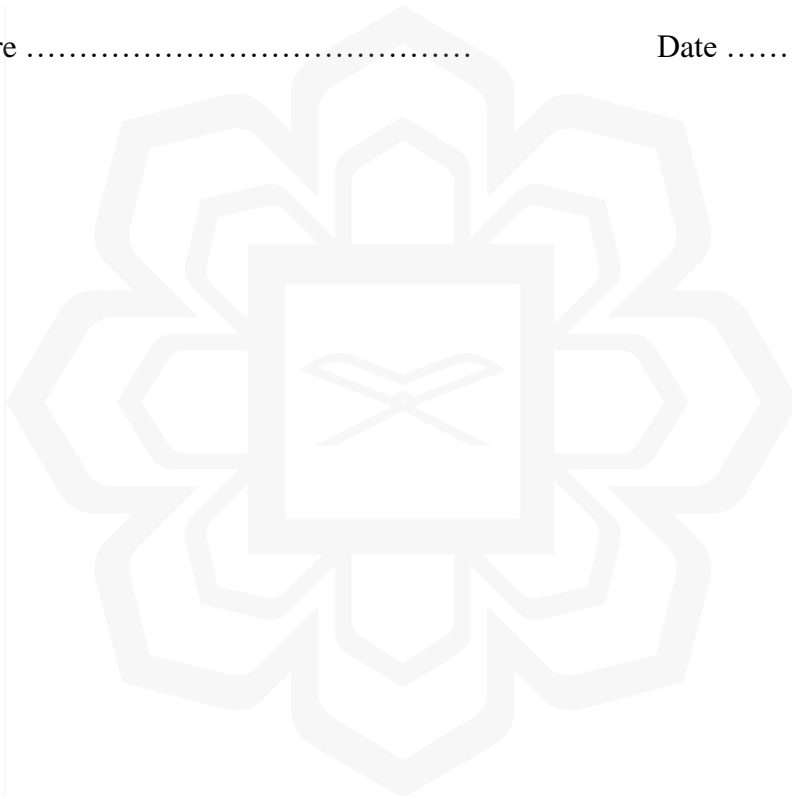
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LIST OF ABBREVIATION

DCA	Department of Civil Aviation
DID	Department of Irrigation and Drainage
DiDRR	Disability-inclusive disaster risk reduction
DOE	Department of Environment.
DPOs	Disabled peoples' organizations (DPOs)
DRR	Disaster risk reduction
IAMSAR	International Aeronautical and Maritime Search and Rescue
JKKK	Jawatankuasa Kemajuan & Keselamatan Kampung
JKM	Jabatan Kebajikan Masyarakat
JPP	Jawatankuasa Perwakilan Penduduk
KRT	Kawasan Rukun Tetangga
MMEA	Malaysian Maritime Enforcement Agency
MPP	Majlis Perwakilan Penduduk
NSC	National Security Council (NSC) No.20
PwDs	Person with Disabilities
SAR	Search and Rescue
W.H.O.	World Health Organization

CHAPTER ONE

OVERVIEW OF THE RESEARCH

1.1 INTRODUCTION

This chapter elaborates on the fundamental studies (needs and requirements) of Evacuation Centre for Flood Victims in Malaysia, taking the existing evacuation centre in Kelantan as case studies. This chapter introduces on the research background of a current evacuation centre in Malaysia, research issues arise regarding the evacuation centre, research aim and objectives, research questions to address the objectives, research methodology, scope of research, limitation of the research, the significance of the research and structure of research. The findings from this study will be useful for future planning in managing the flood victims at the evacuation centre to be more manageable and coordinated in term of physical facilities as well as safety.

1.2 RESEARCH BACKGROUND

In December 2014, Malaysia was stunned by the news of the floods taking place on the East Coast of Malaysia, especially in Kelantan. While floods are like an annual occurrence, the year 2014, Kelantan especially was facing the most significant flood since 2004 and the last big flood in 1967. In the history of Kelantan, the massive flood that occurred in 2014 was the worst, where the water levels in most of the floods in the region were superseded by the floods of the last big flood of 1967 (National Security Council (NSC) via Datuk Mohamed Thajudeen Abdul Wahad, 2015).



Figure 1.1: House of flood victim at Manek Urai, Kuala Krai, Kelantan that destroyed completely from the flood happen in 2014.



Figure 1.2 Train station building at Limau Kasturi, Gua Musang, Kelantan was damaged by flood happen in 2014

According to a study reported by Izawati Tukiman (2008), on 5 January 1971, during severe floods that occurred in many parts of the Peninsula of Malaysia, the government of Malaysia has declared it as a national disaster. The Department of Drainage and Irrigation was entrusted with a significant flood mitigation program in 1972 due to damaging national flood in 1971. Flood Mitigation and Hydrology were designed as a function of the Department of Drainage and Irrigation. In both urban and rural areas, the dams were constructed, rivers canalised and drains improved to reduce flooding as a result of this program. Maintenance and management of river reserves, river diversion, river training and clearing were some of the other measures

had been taken. Kelantan River, Terengganu River, Pahang River, Batu Pahat River, Muar River and Kelang River basins have been installed with a flood forecasting system as part of measures taken.

The first publishing of the Hydrological Procedure 'HP1: Estimation of Rainstorm Design in Peninsular Malaysia', had been made in 1973. In 1979, the Department of Drainage and Irrigation agreed to set up the Planning Branch for Project Planning and Feasibility Studies to improve drainage systems. According to Thajudeen (2015), the Council identified two key explanations for the unexplained increase in water levels, one of which is attributable to shifting climate patterns and adverse weather effects. The other could be attributable to unregulated land management, tree swelling and soil degradation. Based on these claims, it suggests that the recent global disasters that have arisen have resulted from our poor land management and reckless people's destruction, which has made the world worse.

Much planning is needed to deal with the situation in the future, due to the unforeseen environmental disturbance. It is to avoid the difficulties and barriers to save the victim and to be psychologically and physically prepared to deal with the disaster. It is crucial to have a proper position in the evacuation centre which can provide a great deal of warmth, security and a clean atmosphere due to a sudden rise in victims that is attributed to crowded people. The layout of the evacuation centre must be scalable that can accommodate a large number of people expected to be there to promote and train victims.

Public buildings such as schools, religious buildings, including mosques or community halls, have been used as evacuation centres in Malaysia every year (Ruwaidy et al., 2016). Several issues faced by the victims were recorded, particularly in terms of physical facilities, such as providing improper assistance in terms of facilities, privacy and many others. As a result, a suitable emergency centre area is required in the future to provide better services for the victims.

Consequently, the primary aim of the research is to establish the key criteria to achieve the most appropriate and suitable physical facilities as well as meeting the psychological needs for the victims of natural disaster.

1.3 RESEARCH PROBLEM AND ISSUES

The evacuation centre is functions to provide a comfortable stay and an assistant with the security, safety and comfort of the victims in facing the disaster. However, the current state of the existing evacuation centre in East Coast of Malaysia, particularly in Kelantan, which mostly uses the schools, mosques and community halls as their evacuation centre, causes many inconveniences due to the location is not accessible to flood victims and the after effect of the building leaves with the state of destructions of property, garbage and sewerage system is clogged (Ruwaidy et al., 2016).

Malay Mail (30 October 2019) reported that Former Deputy Prime Minister, Datuk Seri Dr Wan Azizah Wan Ismail stated that the current evacuation centres are not suitable to be used as centres especially at school as it will disturb the students, teachers as well as the education activities. Therefore, the need is imperative to explore other sites or buildings that were not utilised to be turned into evacuation centres. She also added that the concern regarding the sewerage system at the evacuation centres is not well maintained and fear of disease infection when too many flood victims converge at one place.

Based on a report by New Straits Times (3 December 2019), Former Deputy Prime Minister, Datuk Seri Dr Wan Azizah Wan Ismail stated that current evacuation centre still needs to be improved in term of supplies to the flood victims particularly to women and children such as necessities like blankets, foods and others. Privacy for female victims need to take into account, especially for them to pray and necessities for disabled people at the centres.

It also appears that the authorities are still lacking in providing basic necessities such as food supplies, a place to stay like tents and rescue transportation due to lack of fund and resources (Ruwaidy et al., 2016). Due to that, many Non-Governmental Organisations (NGO) were taking the initiative in providing temporary tents or shelters and other necessities to help flood victims (Ruwaidy et al., 2016). The authorities face many difficulties in assisting and saving the flood victims during a disaster due to the weak management of the evacuation centre in term of managing the supplies, maintenance of facilities and others. It has also been reported that evacuation

centres are lacking adequate food supplies, miscommunication among victims, an overpopulated of occupancy (victims more than capacity of the evacuation centre can reside) and insufficient infrastructure and equipment (Said, Gapor, Samian, Abed Aziz, 2013).



Figure 1.3: The tent was given to each families as sleeping and personal area at evacuation centre (Source: Harian Metro Online, 2019)

1.4 AIM AND OBJECTIVES

The research aim is to establish the key criteria to achieve the most appropriate and suitable physical facilities as well as meeting the psychological needs for the victims of natural disaster by assessing the selected case studies of evacuation centres in Kelantan. The research objectives are thus, established to meet the research aim:

- i. To review the requirement of the physical facilities for the evacuation centre.
- ii. To assess the component of the physical facilities for the current evacuation centre.
- iii. To propose the criteria of the physical facilities for the evacuation centre.

1.5 RESEARCH QUESTIONS

Research questions were derived from the research objectives, which are as follows:

- i. What are the requirements of the physical facilities for the evacuation centre?
- ii. What are the components of the physical facilities for the current evacuation centre?
- iii. What are the criteria for physical facilities in the evacuation centre?

1.6 RESEARCH METHODOLOGY

A qualitative approach was used for this research as primary data, using the information collected via primary observation and interview methods, and secondary data through literature analysis, to analyse the theoretical aspect of research. The qualitative approach was applied as the purpose of this analysis was not to conduct a test but to provide the sample with a general context.

Case studies are to be performed by interviews and observations. Tools include a detailed assessment of the building used as a disaster relief centre and an inventory study. The purpose and nature of the case studies will be addressed, and the approach used will be clarified in the following subsections.

An inventory review will be undertaken to examine the specific aspects of the disaster relief centre, which focuses primarily on victim shelter. Within this chapter, the case study also will be elaborated to provide an overview approach and to highlight the nature and objectives of the case studies.

Table 1.1 The Research Framework

Research Aim	Research Objectives	Research Questions	Instruments	Method of Analysis
to establish the key criteria to achieve the most	To review the requirement of the physical facilities for	What are the requirements of the physical facilities for	Literature Review, Case Studies & Unstructured	Inferential Analysis

appropriate and suitable physical facilities as well as meeting the psychological needs for the victims of natural disaster by assessing the selected case studies of evacuation centres in Kelantan.	the evacuation centre	the evacuation centre?	Interviews	
	To assess the component of the physical facilities for the current evacuation centre	What are the components of the physical facilities for the current evacuation centre?	Case Studies & Unstructured Interviews	Inferential Analysis
	To propose the criteria of the physical facilities for the evacuation centre	What are the criteria for physical facilities in the evacuation centre?	Case Studies & Unstructured Interviews	Inferential Analysis