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## Optimisation of Flooding Recovery for Malaysian Universities

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### Abstract

Malaysia's 11<sup>th</sup> Five Year Plan (2016-2020) emphasises the need for strengthening of disaster risk management strategies. This is in accordance with the Sendai Framework for Disaster Risk Reduction (2015–2030), which calls for substantial global reductions in the occurrence of disasters by 2030. Flooding in Malaysia normally occurs after heavy rains, especially during the monsoon seasons. The resulting floods are increasing in severity because of climate change, to the point where serious flooding is occurring almost every year. The effects of flooding are extensive and widespread all over the country, with consequential loss of life and property. The infrastructure of the Malaysian university sector is not immune from these effects. Recovery to an operational state may be highly problematic, especially if research and teaching infrastructure is damaged. The recovery process may be complex and would be aided by the implementation of strategies leading to improved resilience to flooding, as both processes require co-ordination among many stakeholders. At present, there is an almost total lack of information on flooding recovery strategies improvement in the context of the Malaysian university sector, and this is a matter of some concern. This paper describes potential improvements to apply to Malaysian universities' current measures for handling the aftermath of flooding. The objective of the paper is to review relevant literatures related to flooding recovery planning in Malaysian universities. The main methodologies used in this study include a literature review and interviews with stakeholders.

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### 1. Introduction

Natural disasters are occurring more frequently with a changing climate; thus, planning for and expecting the

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worst must play a central role in development. Natural disasters such as floods are hard to predict and cannot be prevented completely. It is believed that Natural Disaster Risk Reduction (NDRR) is a cost-effective investment in lessening future losses especially for developing countries [1]. Malaysia has previously experienced natural disasters, the majority of which has been flooding. The challenge for Malaysia is to reduce the effects of flooding problems as the nation progresses economically. The Malaysia Five Year Plan (2016-2020) [2] emphasises strengthening disaster risk management through five phases: prevention, mitigation, preparedness, response and recovery. Although the present Malaysian government already has procedures for handling natural disasters, there are still opportunities to achieve further improvements in flooding recovery disaster management. Malaysian universities are the focus of this study. Many people are present at these institutions at any time and in addition there are major holdings of knowledge capital (libraries, teaching material and research in progress) and expensive research equipment and other infrastructure on university premises. The potential for loss and disruption caused by flooding is immense, and it is no exaggeration to say that the adverse impacts of such events could be critically damaging. Setting aside human impacts, the loss of vital research equipment with a long lead in time for replacement could effectively end programmes of research and thus render any investment in said research practically worthless. The Malaysian government has put millions of dollars into higher education for Malaysians in recent years [3]. It is thus prudent for the Malaysian university sector to develop a proactive approach rather than a reactive approach for dealing with flood risks.

## 2. Methodology

This paper is concerned with Natural Disaster Risk Reduction (NDRR), with a focus on flooding recovery efforts at the Malaysian universities. The methodology used in this paper consists of two parts, which are literature review and interviews. Literature reviews were gathered from reference materials extracted from sources such as journals, articles, websites, country reports, relevant statistics and databases. The combination of evaluation of the literature gathered, risk assessment and knowledge gathered from stakeholder interviews were used to identify ways to reduce possible flooding impacts on the Malaysian university sector. The data on flooding disasters come from the Malaysian government official statistic websites [4]. A detailed literature search for relevant academic papers and Malaysia government flooding reports (for example [5]) was carried out. In recognition of the fact that effective handling of flooding risk and recovery requires a multidisciplinary approach, the search covered major disciplines such as knowledge management, risks management, civil engineering and geography. In-depth interviews were conducted for the purposes of data gathering from key stakeholder groups. Stakeholders working closely within the area of universities disaster preparedness, risk management, facilities management and emergency team operations were identified and systematically interviewed. The interview sessions and discussions for every case study were recorded and transcribed. Stakeholders were contacted via email and telephone to set up a face-to-face meeting, which took about 60 to 80 minutes each. This is a type of semi-structured interview. The questions were designed according to the objectives and based on relevant information needed. The semi-structured interview approach allows any follow-up questions to be tailored according to the responses received during the interview. Stakeholders were chosen based on their job scope and responsibility within the university organisation. The duties of each personnel were identified, including their involvement in assessing risks of flooding in universities and the effects of flooding on affected buildings. The case study involved several geographical areas. Four MARA universities (UiTM) in four states were chosen. Only areas that previously been affected by flooding or having high risks of future flooding were studied. Field trips and individual observation were carried out at MARA (UiTM) campuses in Shah Alam (Selangor), Terengganu, Kelantan and Johor.

## 3. Literature Review

### 3.1. Disaster

The United Nations International Strategy for Disaster Reduction (UNISDR) defines a disaster as “a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability and capacity, leading to one or more of the following: human, material, economic and environmental losses and impacts” [6]. The International Emergency Disasters Database Disaster

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