

Proposal Report
On
Flood Hazard Mapping Project
In
Muar and Batu Pahat, Johor

Prepared By

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FLOOD HAZARD MAPPING TRAINING COURSE

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1.0 Background

Flooding is the most significant natural hazard in Malaysia in terms of population affected, frequency, area extent, flood duration and social economic damage. Having 189 river basins throughout Malaysia, including Sabah and Sarawak, the rivers and their corridors of flood plains fulfil a variety of functions both for human use and for the natural ecosystem, i.e. they are fundamental parts of the natural, economic, and social system wherever they occur. At the same time, rivers might be the largest threat to entire corridor areas.

Flood management aims to reduce the likelihood and the impact of floods. This includes the management of flood disaster and relief, during and after flood. Experience has shown that the most effective approach is through the development of flood management programs incorporating a holistic approach with respect to the following strategies:

- i. *Prevention* - preventing damage caused by floods by avoiding construction of houses, properties and industries in present and future flood-prone areas; by adapting future developments to the risk of flooding; and by promoting appropriate land-use, agricultural and forestry practices;
- ii. *Protection* - taking measures, both structural and non-structural, to reduce the likelihood and the impact of floods in a specific location;
- iii. *Preparedness* - informing the public about flood risks and what to do in the event of a flood;
- iv. *Emergency response* – developing emergency response plans and actions in case of a flood; and
- v. *Recovery and lessons learned* - returning to normal conditions as soon as possible and mitigating both the social and economic impacts on the affected population.

Thus, the production of Flood Hazard Map (FHM) is an alternative and necessary way to reduce the impact of floods in the affected area. Considering that the government is looking for an effective way to reduce the flood's impact with much lesser amount of cost, a FHM is able to provide the public with substantial information on the range of possible damage and the disaster prevention activities. The production of this map will give much benefit not only to the public but also to the government. In addition of being able to make public be prepared for flood, the government also can reduce the spending of money especially during the emergency rescue stage as many affected residents are already evacuating themselves when given warning or evacuation order.

2.0 Outline of Muar and Batu Pahat Area

The target areas for this FHM are Muar and Batu Pahat District. Both districts are located at the upper north of Johor Bahru. In December 2006 and January 2007, these areas and all other districts in Johor Bahru have been hit by flood that caused extensive damages in term of life and properties. This flood was due to a couple of “abnormally” heavy rainfall events which caused massive floods. *Figure 2* shows the Isohyet Map for three consecutive days in Johor Bahru. The estimated total cost of these flood disasters is RM 1.5 billion, considered as the most costly flood events in Malaysian history. Recent urbanization amplifies the cost of damage in infrastructures, bridges, roads, agriculture and private commercial and residential properties. At the peak of that recent Johor flood, around 110,000 people were evacuated and sheltering in relief centers and the death toll was 18 persons.

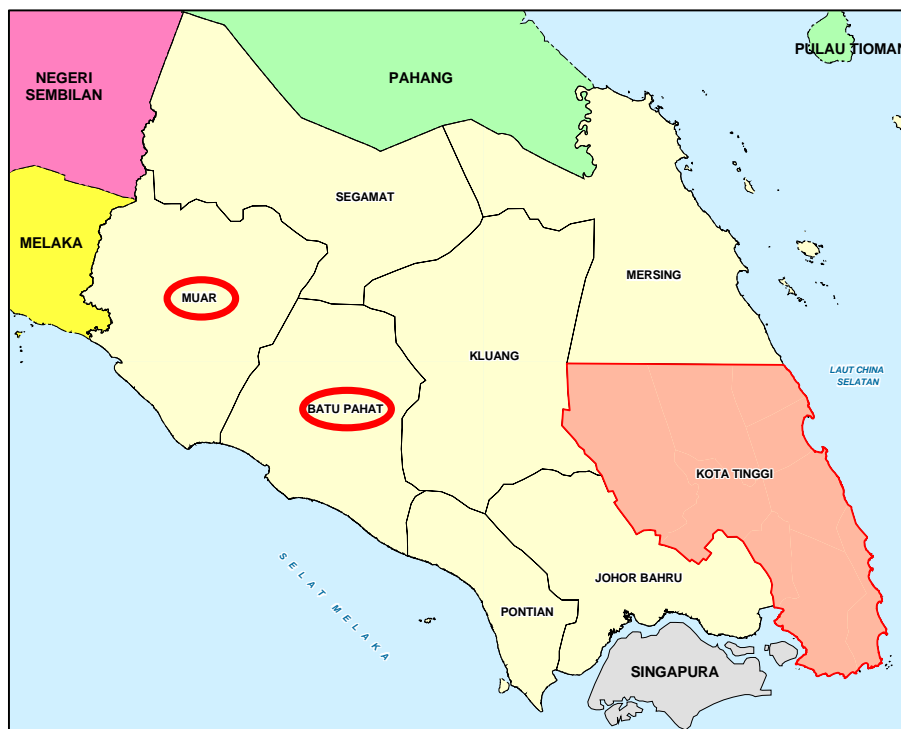


Figure 1: Location of Muar and Batu Pahat District

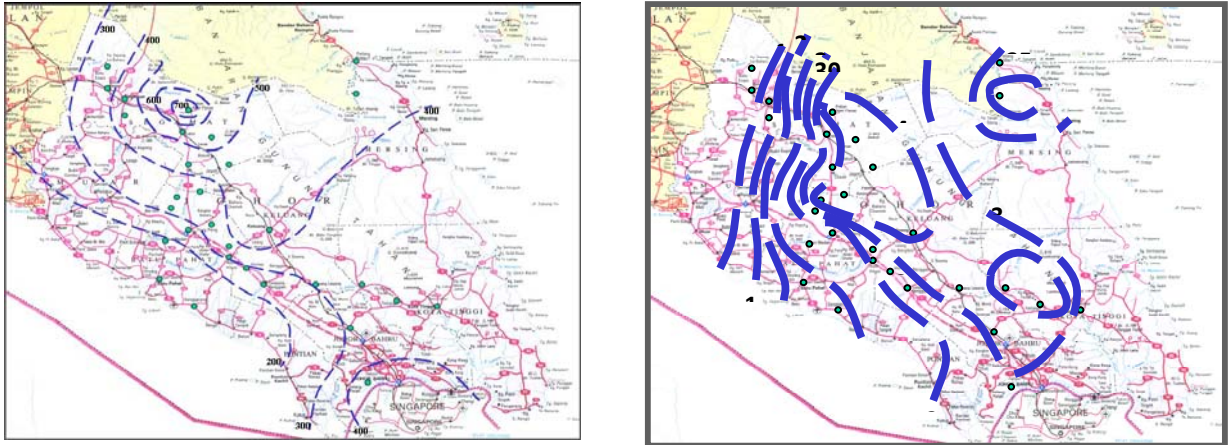


Figure 2 : Isohyet Maps from i)18-20 December 2006 and i)11-13 January 2007 for Johor Bahru

In Muar and Batu Pahat alone, 36,052 and 66,491 people have to be evacuated from their house and the estimated cost of damages is RM 214 million. Muar district formerly covers 2346.12 km², with a population of 328,695 (2000). Muar River Basin is consists of Muar River and several others small tributaries. The worst affected area is Pagoh. Muar is home to several famous historical places that commemorate the establishment of Malaysia. Due to this flood, many of the preservation areas have been badly damaged.

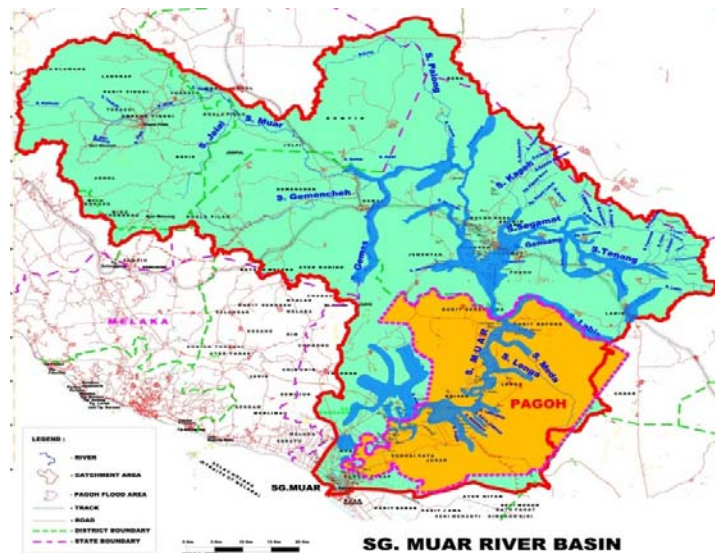


Figure 3: Muar River Basin

Meanwhile, Batu Pahat covers 1872.56 km² with population of 538 880 (2007). During 2006 and 2007 flood, this area has been inundated for more than two weeks

due to its low land topography. Many of the residents in this area cannot return to their home as it was badly damaged. It took almost a month for them to stay in the evacuation centers. Subsequently, government has come out with immediate action plan to mitigate the flood but unfortunately, the structural countermeasure is preferred more than non-structural countermeasures. Therefore, it is a vital time to start introduces the FHM as a way of flood prevention.

3.0 Schedule of Implementation

As FHM has been introduced to the Government of Malaysia in 2004, therefore several major actions have been completed throughout the years. For instance, flood disaster management policies i.e. Operation Procedure No. 29 published by the National Security Council and Department of Irrigation and Drainage (DID) Circular No. 2/2003 – “Guidelines for Management of Flood Disasters during the Monsoon Season and Flash Floods” have been established by the government. Then a specific unit, Non-Structural Unit under DID, that handled matters regarding FHM has also been set up. Hence it make the next action of producing FHM is much easier to be executed. Below is the schedule of implementation of FHM in Muar and Batu Pahat area:

Table 3-1 Action Plan toward Effective Flood Hazard Map

Action	Year	2008	2009	2010
1. Promotion of FHM <ul style="list-style-type: none"> - Presentation to the FHM Committee - Generation of ideas between related agencies - Acquire consent from the decision maker i.e. Economy Planning Unit, Ministry of Finance - 		■	■	
2. Production of FHM <ul style="list-style-type: none"> - Carry out dialogue with the stakeholders to get an initial view from various perspectives - Conduct survey/town watching etc. to collect crucial data on site – possible evacuation route, evacuation center, dangerous spots, etc - Carry out survey/interview with residents 			■	

■

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<p>in the affected areas for their early view to ensure the effectiveness of FHM</p> <ul style="list-style-type: none"> - Carry out inundation analysis to get inundation map of the target areas - Produce a simple, easy to understand FHM but with enough significant data - Present draft to the committee for approval - Acquire endorsement from various agencies to be publicly distributed 			<p>■</p> <p>■</p>
<p>3. Dissemination of FHM to the public</p> <ul style="list-style-type: none"> - Identify mechanism of dissemination of FHM i.e. media, internet, newspaper, campaign, pamphlet etc - Assign district/municipal government as person in-charge - Provide residents with enough education/information of FHM - Conduct routine briefing/explanation to the residents to create awareness - Provide assistance to the district/municipal government i.e. budget, manpower etc. 			<p>■</p> <p>■</p> <p>■</p> <p>■</p> <p>■</p>
<p>4. Improvement of FHM</p> <ul style="list-style-type: none"> - Develop and improve technique in developing flood hazard map. - Review the approach in developing flood hazard and dissemination. - To review the effectiveness of FHM in terms of reducing cost of damages/loss of life. 			<p>■</p> <p>■</p> <p>■</p>

4.0 Estimated Budget

For the purpose of production and promotion of FHM, budget will come from an annual fiscal budget of the Department of Irrigation and Drainage. Total amount of budget is MYR 320,000 (about USD 88,400) as shown in Table 4-1.

Table 4-1 Estimated Cost of Production and Dissemination of FHM

Item	Task	Cost Estimate (MYR)
1.	Promotion of FHM	
	- Training Courses	50,000
	- Seminar/Conferences	20,000
	- Materials	5,000
2.	Production of FHM	
	- Survey/Town Watching	70,000
	- Data Collection/Acquirement	30,000
	- Modelling Software/Programs	10,000
	- Map Publishing	100,000
3.	Dissemination of FHM	
	- Dissemination	30,000
4.	Improvement of FHM	5,000
	TOTAL	320,000

5.0 Expected Effectiveness

The expected effectiveness of Flood Hazard Map in Muar and Batu Pahat are as follows:-

- i. Provide the residents with information on the range of possible damage and the disaster prevention activities;
- ii. To be used as a basic material that can be utilized to provide disaster prevention service;

- iii. As a tools to establish a warning system and the evacuation system;
- iv. As a planning purposes, to give immediate information on the safest site for new developments, and
- v. As a technical support to the Director of State Security Department for issuing the evacuation order / recommendation order.