

PREPAREDNESS PLAN FOR FLOOD: A BOTTOM UP APPROACHN. N. M. Shariff^{1,*} and Z. S. Hamidi²

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ABSTRACT

Floods have caused major disasters around the world and these include Malaysia which is inevitable. However, we can be prepared by taking the lessons from the previous flood disasters. This paper attempts to highlight preparedness plan executed by the community i.e. six months before the expected flood in December 2015. Preparedness plan can be initiated during rehabilitation process at every level in the affected community by the community themselves-bottom up approach. It can be done through Community-based Disaster Risk Management (CBDRM) and intensive mutual assistance. The preparedness plan does not mean the community does not need help from the authority, but it is an integral effort. Hopefully, this bottom up approach will fill the gap between the community and the authority.

Keywords: preparedness plan; flood; disaster; Malaysia; CBDRM.

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1. INTRODUCTION

Normally, preparedness plan in Malaysia reactive rather than proactive. Disaster management in Malaysia is traditionally almost entirely based on a government-centric top-down approach. However, Malaysia is serious to give priority to flood mitigation project and the establishment



of Disaster Management and Relief Committee which is more holistic representation from many institutions such as Ministry of Information, Ministry of Finance, Ministry of Health and many more [1]. Preparedness is a part of systematic incorporation of disaster risk reduction. It can be said that preparedness is a state of readiness. Three (3) elements must presents in the state of readiness i.e. 1) prepare; 2) plan and 3) stay informed. Preparedness is the range of deliberate, critical tasks and activities necessary to build, sustain. At the same time, improve the operational capability to prevent, protect against, respond to and recover from domestic incidents involving efforts at all levels of government as well as between government and private sectors and non-governmental organizations. Fig. 1 describes the cycle of disaster.



Fig.1. Cycle of disaster

Preparedness components: 1) policies/governance; 2) preparedness program; 3) program management; 4) financial resources; 5) performance management reporting; 6) information management; 7) technical guidance and tools; 8) recruitment; 9) media and 10) business continuity management. Preparedness strategies/elements: 1) experience; 2) action plan; 3) assets; 4) knowledge skill; 5) resources and 6) timeline.

The main objective of this paper is to highlight preparedness plan by the community after a year being hit by 2014 flood. The preparedness plan has been started six months before the expected flood in December 2015. Due to time and financial constraint, this paper only covers

certain aspect of preparedness plan.

1.1. Risk Profile of Malaysia

Although Malaysia is upper middle income country, Malaysia has been listed among top ten countries for the number of victims of natural disasters victims together with Brazil, Burkina Faso, Sri Lanka and Serbia. Malaysia is vulnerable to natural disaster threat such as flood, earthquakes, haze, storm and landslide. International Disaster Database reported that from 1990-2014, the most frequent disaster happened in Malaysia is flood 62.5%, followed by storm 13%, landslide and wildfire 8% each, drought 4%, earthquake and mass movement 2% each (Table 1). Therefore, flood hazard in Malaysia contributes 98.7% of annual average loss (AAL) compared to other hazard [2]. Annual average loss (AAL) includes property and crop damage, number of casualties, disease epidemics and other intangible losses [3].

Table 1. Type of disaster in Malaysia: Its frequency, mortality rate and economic issues [2]

Type of Disaster	Frequency (%)	Mortality (%)	Economic Issues (%)
Flood	63	24.1	60
Storm	13	39.9	2.5
Landslide	8	13.9	0
Wildfire	8	0	14.1
Drought	4	0	0
Earthquake	2	11.6	23.4
Mass movement (dry)	2	10.4	0

Climate of Malaysia are uniform temperature, high humidity and abundant rainfall. Winds are generally light. Malaysia, which is in the equatorial doldrums very rare to have a clear sky even in periods of severe drought. Malaysia is also rare to have a period of several days with no sunshine except during the northeast monsoon season [4].

With annual heavy monsoon rains averaging more than 3000mm, there are three types of seasonal variation of rainfall in Peninsular Malaysia (Table 2) states on the east coast of Peninsular Malaysia (Kelantan, Pahang and Terengganu)-November, December and January are the months with maximum rainfall while June and July are the driest months in most states; 2) areas other than the west coast of Peninsular Malaysia, rainfall pattern shows two

periods of maximum precipitation, separated by two periods of minimum rainfall. Maximum primary usually occurs in October-November, while the secondary maximum occurs in April-May. In the northwest, the primary minimum occurs in January-February while the secondary minimum occurs in June-July. In other places, the primary minimum occurs in June-July while the secondary minimum occurs in February and 3) the pattern of rainfall in the west coast of Peninsular Malaysia is much affected by the incident ‘Sumatras’ May and August where multiple maxima and minima pattern does not exist. October and November are the months with maximum rainfall and February are the months with minimum precipitation. Maximum rainfall for March-April-May and June-July minimum does not exist or is less clear [5].

Table 2. Seasonal variation of rainfall

Type	Coast	Maximum Rainfall	Minimum Rainfall
1	East coast*	Nov, Dec, Jan	June, July
	East coast	<ul style="list-style-type: none"> • Oct – Nov • Apr – May 	-
2	West coast	-	<ul style="list-style-type: none"> • June – July • Feb
	Northwest**	-	<ul style="list-style-type: none"> • Jan – Feb • June - July
3	West coast	Oct and Nov	Feb

* Kelantan, Pahang and Terengganu, ** Perlis, Kedah and Penang

1.2. Flood Disaster in Malaysia

Floods have caused major disasters around the world [6]. Annually, floods occur in Malaysia has caused damage to property and loss of life. Therefore, it is useful to make a distinction between ‘normal’ and ‘major’ flood disasters. ‘Normal’ floods are seasonal monsoon floods, whereby the waters do not normally exceed the stilt height of traditional Malay houses. Historically, there have been big flood events in 1886, 1926, 1931, 1947, 1954, 1957, 1963, 1965, 1967, 1970/1971, 1988, 1993, 1996, 2000, 2006/2007, 2008, 2009, 2010, 2011, 2012, 2014 with every year flood in northern part of Kelantan [4] (Table 3).

Table 3. Flood incidents in Malaysia

Date/Year	Incident	Property, Material, Crop or Other Losses (USD)	No. of Deaths	No. of Victims Evacuated
1886	Flood known as “The storm forest flood”	Thousands of hectares of forests destroyed	NA	
1926	Most of Peninsular Malaysia	Damage to natural environment	NA	NA
January 1971	nearly the whole of Peninsular Malaysia with Kuala Lumpur the most badly hit	65.2 million	61	
December 1996	Floods brought by Tropical Storm Greg in Keningau (Sabah State)	300 million	241	
2000	Floods caused by heavy rains in Kelantan and Terengganu	Millions	15	
December 2006 and January 2007	Floods in Johor State	489 million	18	
2008	Floods in Johor State	21.19 Million	28	
2010	Floods in Kedah and Perlis	8.48 Million (Aid alone)	4	
2011 and 2012	La Nina in 2011 and 2012 (which brought floods)	NA	NA	
December 2014	East coast of Malaysia	481.55 Million	21	~300,000

Every year, natural causes such as 1) heavy rainfall above the norm compared with the flood season before which caused river bank flood. In the case of northern of Kelantan, overflow state of Golok River often causing flood. Moreover, the occurrence of heavy rain fall above the norm compared with the flood season before; 2) low lying low-lying flat terrain in Fig. 2 show flood prone areas in Malaysia 29,000 km² affecting more than 4.82 million people and 3) monsoon season also known as *musim tengkujuh*-windswept around the northeast monsoon from October to December were the main causes of flooding. However, in 2014 flood incident, 3) deforestation that reduces the role of forests as natural flood attenuation systems has become one of the contributing factor to the flood which fall under human induced flood [4].

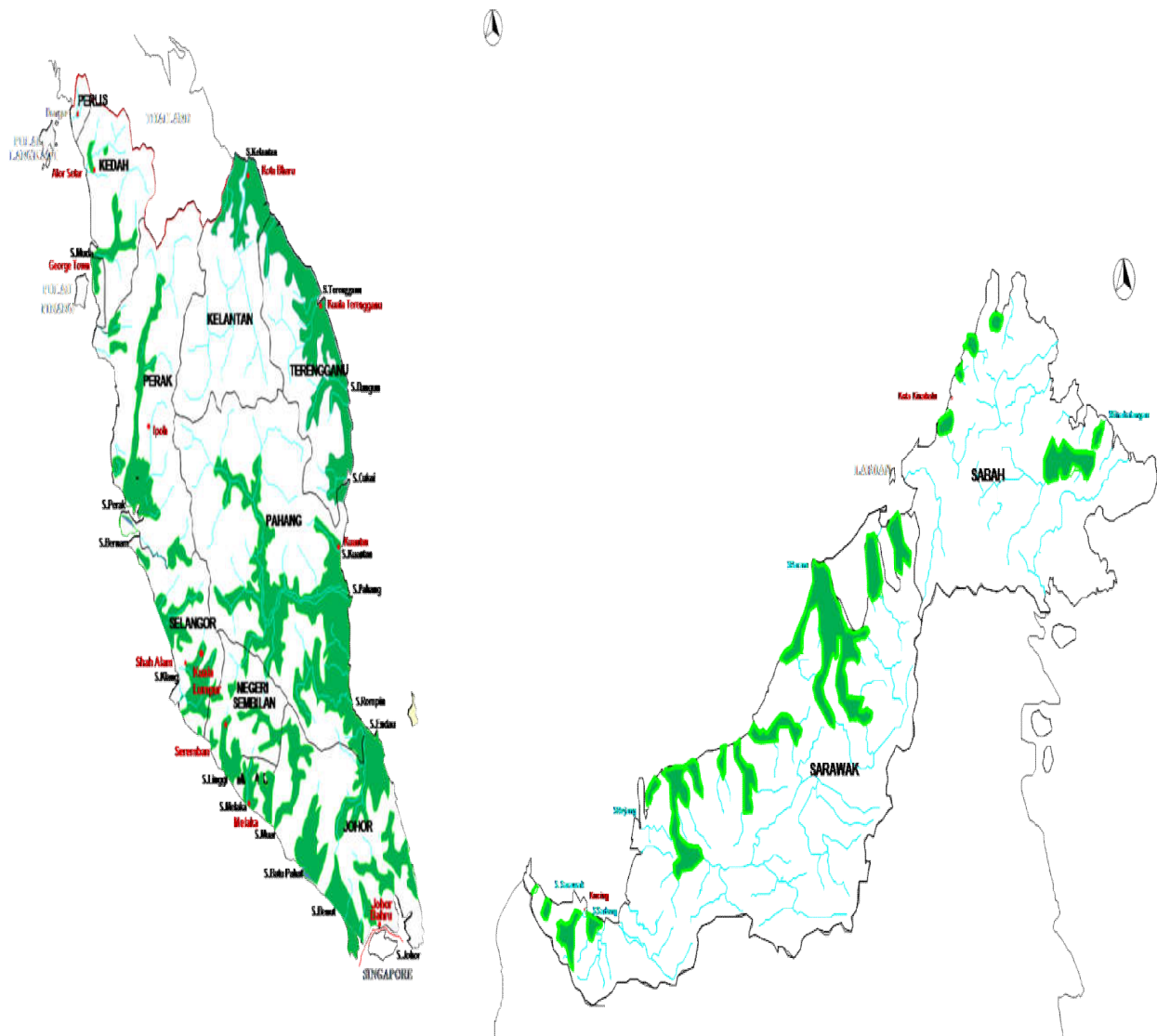


Fig.2. Flood prone areas in Malaysia [7]

1.3. Malaysia's East Coast Flood 2014

To date, 2014 flood was the worst in the history of flooding in Malaysia with more than 300,000 people had evacuated with 380 flood relief centers. The duration of the disaster is from 16th of December 2014 till 2nd of January 2015. Total property damage and infrastructure reaches RM2 billion. The government requires RM9.32 billion for the construction of all infrastructure and upgraded drainage in urban and rural areas.

Several factors that constraint post flood disaster: 1) politicization of flood disaster; 2) mediatization of flood disaster; 3) lack of awareness and volunteerism; 4) climate change; 5) short memory span and 6) erosion of social capital [5]. Common concern during flood: 1) health and hygiene; 2) psycho-social; 3) coordination; 4) aid volunteers; 5) infrastructure and 6) others such as temporary shelter, power supply, property loss (total, partial, small or abandoned construction with total loss) etc. Lack of coordination has become the issue in Flood 2014.

2. METHODOLOGY

In this research, we choose flood-prone community in Machang, Kelantan. The assessment was done during the 6 months of preparation before the expected flood in December 2015 by interviewing community members.

3. RESULTS AND DISCUSSION

For this case, community-based preparedness plan is a bottom up approach in disaster risk reduction. Preparedness plan can be initiated during rehabilitation process at every level in the affected community. In this case, there are 2 important things were executed by the community for the preparation: 1) Community-based Disaster Risk Management (CBDRM) and 2) intensive mutual assistance (*gotong-royong*) which was done as early as six months before the expected flood (around December 2015).

CBDRM is a part of Building Resilient Community (BRC) [8] module by MERCY Malaysia. This kind of training is done 10 months before the expected flood. In conducting the CBDRM, they need to understand the flood risk, have the knowledge and technology to mitigate the risk, share flood hazard information and exchange this information with other vulnerable

communities. Therefore, during the training, they are exposed to several related topics such as climate change, natural elements and disaster, early warning disaster, what-to-do, grab bag for individual and family, health and hygiene. The above-mentioned topics look very common but people tend to overlook during emergency.

Other than exposing them knowledge on related topics, experience sharing session is allocated in the training-be it their personal experience as flood survivor or volunteer. From that, they learn from each other experience and able to take appropriate actions. They also taught about time, equipment and resources (financial and human resources). The most important lessons in this training are 1) to identify the key actors in providing assistance in the disaster and 2) knowing advantages and disadvantages of their village by mapping them.

One major oversight that most of the groups made was they do not realize that they themselves should be in the middle of the overlapped circles as key actors. By pointing this out, this activity made them envisage that 1) they are as important as others who assisted in the disaster; 2) take in charge (by doing whatever they can) in the disaster; 3) preparing themselves with relevant knowledge on disaster and 4) planning to equip the community/village with appropriate paraphernalia-*machi-zukuri* (community/neighbourhood planning)-the processes of public consultation and public involvement. *Machi* is a noun; community or neighbourhood. *Tsukuru* is a verb meaning to build. *Machizukuri* is sometimes defined as processes of community building.

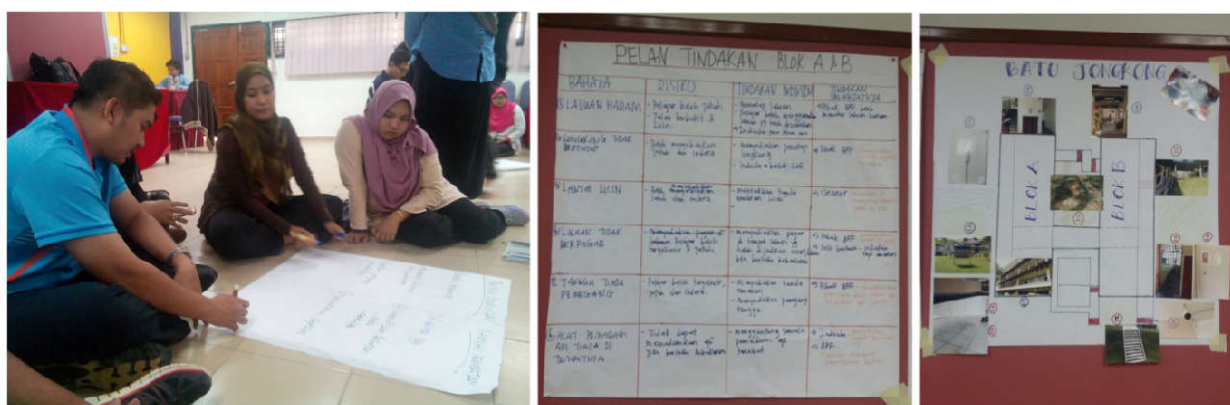


Fig.3. Community based disaster risk management (CBDRM) Training of Trainer

We noticed that-at community level-the *gotong-royong* (mutual assistance) has been taken even more seriously. For instance, clearing the bushes around the village, clearing any blockage in the small river there, clearing and cleaning around public space and between

houses etc. Almost ones affected community felt the throb when December 2015 came. They said, rainfall precipitation was less than last year. However, it has been raining in January-February 2016. Perhaps the rainfall pattern has been shifted.

By engaging the public and giving the public a more active role, their ability to respond to flood [9-10] or other disasters effectively and appropriately will be enhanced. Deeply ingrained in the community three different types of knowledge: 1) local wisdom; 2) vulnerability and capability whether or not their realize it.

4. CONCLUSION

Building a resilient community means the community has knowledge (either through learning or experience and traditional and local wisdom) about their own vulnerability and capability. In other words, the community themselves has become the first respondent to the disaster. Hence, continuous and concerted effort by community and the authority in preparing the preparedness plan is necessary. It is hope that the community stays alert and informed, although the disaster is hard to predict.

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