



**Investigating factors  
for disaster  
preparedness**

E. Mohammad-pajooch  
and K. Ab. Aziz

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# Investigating factors for disaster preparedness among residents of Kuala Lumpur

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and frequency of such phenomena had been attributed to climate change (Yasuhara, 2011). Malaysia experiences a wide range of natural hazards such as flood, landslide, tsunami and smog but none of them are as economically damaging as flood. According to the International Disaster Database, among the top 10 natural disasters occurred in Malaysia that caused the most loss of lives between 2002 to 2011, 6 of them were floods (The International Disaster Database, 2011).

### 3 Disaster and flood preparedness

Before we go into the flood preparedness concept, it is preferred to briefly explain about the flood disaster, hazard and risk. The flood hazard is the potential of damage of flood or in a simple word a threat; once that threat come into the action and affect the individuals it will be considered as a risk. Thus the flood risk could be defined as the probability that the flood hazard could get into the action and lead to the injury. Once the flood damage revealed and become measurable it will be known as the flood disaster. The degree of flood hazard could be depended on several factors; the level of individual disaster preparedness is one of them. Disaster preparedness could be defined as to what extent individuals are ready to deal with natural or man-made disaster; by forecasting and taking precautionary measure and necessary action before a disaster, individual will be able to respond more effectively and ensure speedy recovery (Frieman et al., 2011; Austin, 2010; Perry and Lindell, 2003; Kent, 2004). As disaster preparedness is simply the state of readiness to deal with a disaster if and when it occurs (Frieman et al., 2011); one may simply say that flood preparedness is the extent to which individuals are ready to act and take preparatory defensive action in advance or immediately prior to a flood threat (Frieman et al., 2011; Schmidlin, 2010).

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### 3.1 Perceived risk

Perceived risk can be defined as how much risk or damage individuals perceived to be caused by a hazard or disaster (Sherman et al., 2011). Most people believe that they are safe and either disaster will not occur or if occur they will not be the one who will be affected, thus they don't take any precautionary activity; the reason behind this matter is that people tend to think that natural disaster such as flood are periodic phenomena and it does not occur randomly (Motoyoshi, 2006; Kano et al., 2009). Studies had shown that awareness of a location's flood risk will enhance the individual's flood preparedness, and furthermore, most people will want to be prepared for possible reoccurrence of the disasters, thus, are more likely to gather information (WMO, 2008; Coulston and Deeny, 2010). Other studies also stated the awareness and knowledge of one's surrounding are very valuable, because it will enhance mental readiness (Digian, 2005). However, studies have shown that the factors influencing flood preparedness are not only being adequately informed about the surrounding, but social-demographic characteristics could be also considered as important factors. Individual social-demographic differences (gender, house ownership, education, etc.) will result in inequality in experiencing flood impacts; and the severity of the impact on individuals will depend on the extent of the disaster (Coninx, 2010; Walker et al., 2006; Viswanath et al., 2011).

### 3.2 Socio-demographic as a factor of preparedness

The current population of Malaysia is estimated to be 28.6 million, among which 67.4 % are Malay, 24.6 % are Chinese, 7.3 % are Indians and 0.7 % other ethnics. Among the population 27.6 % are below 15 years old, 67.3 % are between 15 to 64 years old and 5.1 % are 65 years and over (Fox News, 2011; Malaysia Population Clock, 2011). Due to this variation in socio-demographic characteristics, there should be disparities among individual disaster preparedness with respect to their age, race, education, gender, income. Through the past researches, it was also revealed that disaster prepared-

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Based on the findings of Wood and his colleagues, men and women in the US are used to making the same decision in disaster preparedness (Austin, 2010). Similar studies with different outcome developed by Oxfam regarding the status of gender inequality and disaster preparedness in Bangladesh; findings showed the vulnerabilities and loss of life during disaster in Bangladesh is more among women, the reasons were due to women's status in the society and racial discrimination against them (Oxfam, 2011).

### 3.2.4 Property ownership

According to many studies this socio-demographic characteristic positively correlates with disaster preparedness; the findings seem to suggest that home owners seem to be more prepared than those who rent the place (Baker, 2011). Another study also emphasized on positive relationship between home ownership and preparedness, however stated that this correlation was not significant (Coulston and Deeny, 2010). The reason that home owners seems to be more prepared than renters could be due to several reasons which all refers back to the responsibilities that owners takes and renters prefer to avoid (Mulilis et al., 2000). Homeowners invest more to protect their property; this investment could be either in terms of construction, providing emergency equipment or acquiring insurance. The relation between property ownership is not limited to only residential area, study revealed that even businesses that own their premises seems to be more prepared than those who lease (Dahlhamer and Souza, 1997). The reason behind is that, owner believes that they have more asset in danger, thus they prefer to participate in more disaster preparedness activities to reduce the risk (Austin, 2010).

### 3.2.5 Age

In case of natural disaster in Asia in near futures, majority of people who get affected will be people below 65 (Goulding and Smith, 2003). Malaysia specifically has 67% of its population aged between 15–64 years old (Fox News, 2011; Malaysia Population

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2000). Although many studies indicated the positive correlation between the past experience and preparedness, there were also minor studies which showed that past experience does not always enhance preparedness of individuals, and addressed such ineffectiveness due to the degree of experience involved (Paton et al., 2001). Prior experience to disaster might not always directly affect preparedness but its indirect effect has been proved by several studies and it has shown to be one of the preparedness determinants (Lindell and Whitney, 2000). Schmidlin stated in his study of risk factors and social vulnerabilities, women who experienced the flood and have been trapped in their houses during the flooding intended to give special attention to the windows to make sure that they can escape easily in the future in case of flooding (Schmidlin, 2010). Individuals, who also experienced natural disaster and damage of property, seemed to be more attentive to the news than people who did not face natural disaster and property damage (Sattler et al., 1995). In addition, the past experience could be a great asset for the government as well, the experience obtained from the individual could be utilize to improve the response and preparedness of individuals to the future disaster (Said, 2011).

**4 Research methodology**

The research methodology selected for this study are be to test the existence of relationship between the investigated preparedness factors and disaster preparedness of residents of Kuala Lumpur. In this study, survey method was used to collect data from the residents of Kuala Lumpur. In total, 400 questionnaires were distributed in areas around Kuala Lumpur with high population density, a total of 214 questionnaires were received back, which implies a rate of return of almost 53 % .

## 5 Analysis

To determine the role of investigating factors on disaster preparedness, the answers returned from the respondents were keyed in Statistical Package for Social Science (SPSS 17.0) Software database. In the examination of the data collected, firstly, items related to the level of preparedness have been grouped and preparedness index has been identified. All constructs were tested for reliability by using the Cronbach Alpha reliability analysis. The results for all constructs in this research showed Cronbach Alpha of nearly 0.70. Previous studies found for social sciences the overall internal reliability is good when Cronbach Alpha is larger than 0.60.

### 5.1 Preparedness index

Preparedness index has been obtained by weighting reply to eight index questions; where answers to the index questions have been scaled. The summations of answers to all the questions make up the criteria for how prepared the individuals are; therefore, the individuals who responded with more number of “Yes” and “Very Prepared” obtain the highest preparedness level while those with low number of “Yes” along with “Not Prepared” result in low preparedness level. According to the descriptive statistics, if the highest level of preparedness is considered as 8 and lowest as 0, it can be said that individuals scoring below 4 could be considered as not prepared since they were not able to even achieve half of the total score. 133 residents (62 %) scored below 4 and reported that they are not prepared, 49 (23 %) residents scored moderately and obtained score of 4, while only 32 residents (15 %) reported high level of disaster preparedness.

### 5.2 Socio-demographic

#### 5.2.1 Age, gender and income

The results showed that there exist a relationship between age and preparedness. It was observed that as age increased so does the preparedness of residents. It was

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ership classified into two groups of either owned or rented property. There was a fairly positive correlation of 0.213 between this variable and disaster preparedness. There was also a clear relationship between those who read the forecast and their disaster preparedness; forecast positively correlated with having Pearson coefficient of 0.311.

5 Many socio demographic factors illustrated relationship with disaster preparedness; however, the correlation of race with disaster preparedness turn out bit complicated since the result turned out a Pearsons coefficient of 0.053 between race and preparedness, thus race could not be considered a major factor that affects the preparedness.

### 5.3 Past-experience and disaster preparedness

10 The following table represents the correlation of past experience with disaster preparedness, better handling subsequent flood and preparedness, report a high correlation of 0.566, faster evacuation and better reaction toward warning dissemination have also significant positive correlations with preparedness; however minimizing injuries does not have significant correlation with preparedness.

## 15 6 Discussion

There are several uncertainties involved in this research, first uncertainty is involved in terms of data validation, and since in this study the sample size was quit small, extensive data collection could be a better representative of the outcome. Second uncertainties could be due to the lack of data and activities which itself could affect the estimated level of preparedness, one of these factors could be the evacuation map and its distribution among the residents; according our findings majority of residents did not receive any evacuation map and where not even aware about their surrounding and nearest evacuation routes. Detail study regarding the evacuation routes should be conducted, such as estimating number of people at different places at different time of

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ties which are located in a danger zones and shift of poor population into those area which itself could result into new problem; thus population in the danger areas must be estimated and strategy to reduce accumulation of people on that area must be done. The other approach could be enhancing risk awareness, developing preparedness activities (public lecture; training materials, books, educative website and etc.) as well as setting up special groups who can assist and update citizens. Increase in the level of risk perception will enhance the preparedness level, thus it is necessary to keep risk perception at high level, so that individuals always believe that disaster will happen to them and they intend to get more prepared (Reese et al., 2010). Communication gap must be minimized; since individuals will have different educational background, enhancing the education and training could be the key to this issue. Studies showed that a person who is aware of the increased risk for flooding will be more likely to go after collecting information about flooding (Coulston and Deeny, 2010); and this leads the individual to be more psychologically prepared (awareness of one’s surrounding) which could be more valuable than being physically prepared (Digian, 2005). Providing a local and global preparedness index in order to investigate to what extend individual preparedness varies in local and global level, assessing appropriate preparedness action in critical location (such as evaluating the preparedness of hospitals) and how they can handle evacuation in case of facing disasters, (for example, museum employees knowledge on saving the valuable items, or the extent of staff and students knowing what to do when a disaster strikes their schools); all and all could lead to more precise evaluation of preparedness in Malaysia.

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**Table 1.** Flood disaster and number affected. Source: EM-DAT, The OFDA/CRED International Disaster Database.

Disaster Type	Disaster Date	Total Number Affected
Flood	12/1965	300 000
Flood	12/1970	243 000
Flood	01/1967	140 000
Flood	01/2007	137 533
Flood	12/2006	100 000
Flood	11/1988	60 000
Flood	11/2005	30 000
Flood	12/2007	29 000
Flood	11/1986	25 000

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**Table 2.** Socio-demographic correlations. \*\* Correlation is significant at the 0.01 level (2-tailed).

		Preparedness	Q1 Gender	Q2 Age	Q3 Race	Q4 Income	Q5 Education	Q9 Rent.or .Owned	Q10 Forecast
Preparedness	Pearson Correlation	1	0.243**	0.377**	0.053	0.629**	0.526**	0.213**	0.311**
	Sig. (2-tailed)		0.000	0.000	0.440	0.000	0.000	0.002	0.000
	N	214	214	214	214	214	214	214	214

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**Table 3.** Past-experience correlations. \*\* Correlation is significant at the 0.01 level (2-tailed).

Correlations		Preparedness	Q34 Faster.Evacuation.51a	Q35 Better.Reaction.Toward. Warning.Dissemination.51b	Q36 Minimize.Injuries.51c	Q37 Handle.Subsequent. Flood.Better
Preparedness	Pearson Correlation	1	0.255**	0.332**	0.048	0.566**
	Sig. (2-tailed)		0.000	0.000	0.488	0.000
	<i>N</i>	214	214	214	214	214

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**Figure 1.** Disaster flood damage area in Selangor. Source: Ministry of Natural Resources and Environment Malaysia.

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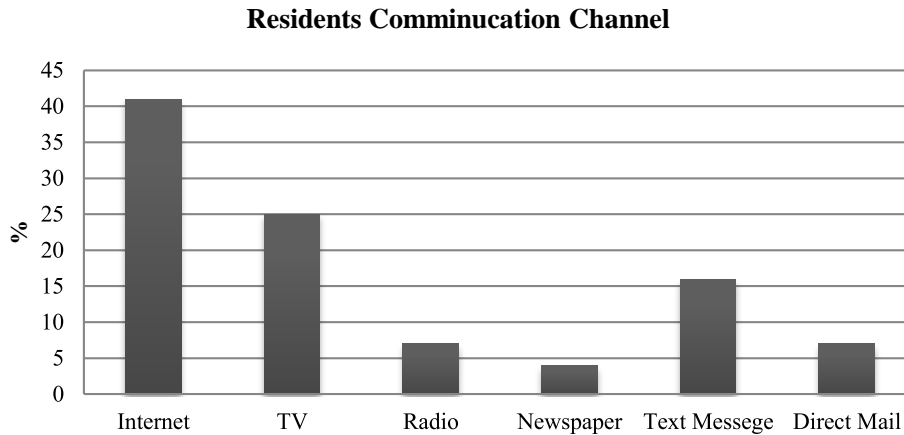
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**Figure 2.** Preferred communication channels by residents.

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