



**Investigating factors
for disaster
preparedness**

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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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ness could have correlated with certain socio-demographic characteristics such as education, income, gender as well as age of individuals (Mulilis et al., 2000; Motoyoshi, 2006; Schmidlin, 2010; Reese et al., 2010; Digian, 2005; The Macaulay Land Use Research Institute, 2011; Fothergill et al., 1999; DESA, 2004; Baker, 2011). In terms of social demographic, factors such as age, gender, education, level of income, house ownership as well as race will be taken into the account in this study.

3.2.1 Level of income

Income could be one the most important factors which shares a relationships with disaster preparedness (Digian, 2005). Many studies found that high income population seems to be more prepared and less vulnerable before, during and even after natural disasters than low income population (Baker, 2011; Rowel et al., 2011; King, 2000). Similar study by Kim and Kang (2010) also expressed the importance of income in a more complicated way; disaster resources could be one of the key elements in disaster preparedness which itself is highly depended on income level. Other studies also stated that people with higher income would have access to more resources such as television, radio as well as car, which assist them in evacuation from vulnerable area (King, 2000). Toya and Skidmore (2007) highlighted the different level of natural disaster impact in two countries that experiencing same level of disaster but having different level of income; the result showed that increase in level of income will result to increase of safety, thus country with less income will have less precautionary measure and will experience more loss during natural disaster.

3.2.2 Race

Many studies found that race plays important role in disaster preparedness where, minority groups are likely to be more vulnerable (Viswanath et al., 2011; Austin, 2010; Baker, 2011). This positive correlation between races and preparedness exists due to reliance of race on several factors that highly correlates with disaster preparedness.

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Clock, 2011). Many studies revealed that older people seems to be less prepared and more vulnerable in the case of natural disaster, however some studies illustrated that older people are more likely to avoid the negative psychological aspect of natural disaster (MMD, 2008; Bourque et al., 2006; Cutter et al., 2003; WHO, 2008; Norris and Murrell, 1998). Advantages of elder people could be their awareness of their surrounding and their prior experience of natural disaster, which makes them more familiar with natural disaster and as a result gives the ability to overcome the disaster more effectively (King, 2001).

3.2.6 Education

Studies in the area of disaster preparedness and education found positive correlations between the two. Thus, educated people will have tendency for higher disaster preparedness (Haulihan et al., 2000; Peacock et al., 1999). Importance of relation between education level and flood preparedness have been emphasized by many studies; however, there are more, need to be explored regarding the impact of these two on each other (Coninx, 2010). Several studies illustrated variation in experiencing flood impacts on individuals due to different education level; the differences was mostly due to differences in understanding the dangers of potential hazards, knowledge regarding hazard behavior, preparation techniques, interpreting and receiving flood forecasting, warnings and accessing electronic media (Digian, 2005; Peacock et al., 1999). Lack of information due to the different education level also lead uneducated people to be more disposed to material damage (Thrush et al., 2005).

3.3 Past experience as a factor of preparedness

Past experience can increase the preparedness to natural disaster, since it influences people to gather more information about the natural disaster, inform the individual about the probability of occurrence of similar events in future and as a result brings better judgment toward natural disaster preparedness (Weinstein, 1989; Lindell and Perry,

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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 % .

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found that residents aged below 20 had a preparedness of 1.5 while this preparedness is doubled for people from 30 to 50. In terms of gender difference, female showed low level of preparedness of 2.68, while male had almost average level of preparedness of 3.37. The residents who have the highest level of income are among the most prepared group with the index of 4.4, while individuals with the range of income below RM 2000 had lowest level of preparedness of 1.7. Residents with the level of income between RM 2000–4000 and RM 4000 to 6000 had preparedness of 3.35 and 3.85 respectively.

5.2.2 Evacuation plan, type of item in supply kit

The survey revealed that 56 % of participants have had an evacuation plan, while 44 % have not had any evacuation plan. A high portion of survey participants (94 %) reported not having a supply checklist, however, 54 % reported to have a survival kit instead. Those prepared individuals who had supply kit seem to have food as the most popular item (82 cases) followed by water (77 cases), medical supplies (56 cases), flashlight (47 cases), battery (32 cases), battery powered radio (27 cases) and fire extinguisher (19 cases) as common items in their supply kit.

5.2.3 Communication channels

Communication channels could enhance community preparedness by providing information regarding risk, evacuation, etc. Nowadays, many people still refer to TV, radio, newspaper and many others type of communication channels to get the latest information; but the most preferred type of communication channels by residents of Kuala Lumpur was discovered with the help of questions in the last part of the questionnaire.

Analysis revealed that a majority of respondents (41 %) prefer to receive information regarding preparedness through the Internet. Respondents mentioned TV as the second point of contact for acquiring information (25 %), while for 21 % of the respondent rated text message as the first priority. Thus, Internet, TV and Text Message are consid-



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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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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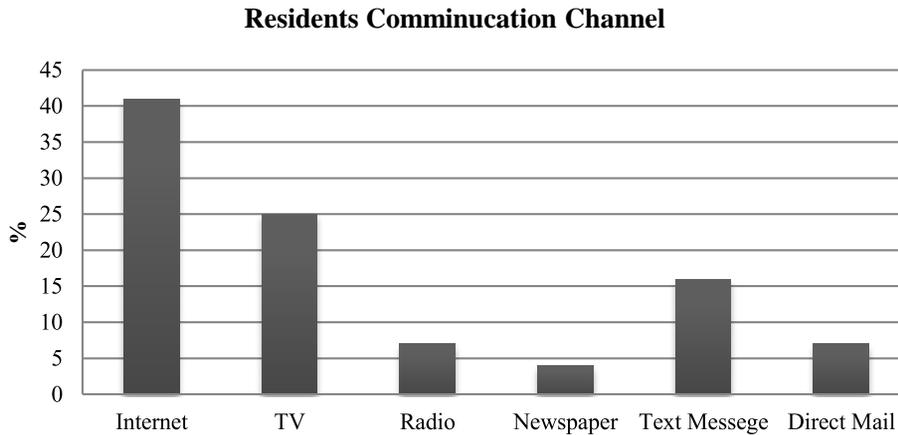


Figure 2. Preferred communication channels by residents.

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