



## Does prior experience really matter for disaster preparedness?

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### Abstract

Climate change and transition toward urbanization had resulted in more frequent and severe disasters in the last decade. While urbanization is potential driver of change and economic growth, climate change had exacerbated resource scarcity and exposed local communities to greater and more frequent disasters. The local communities in Malaysia are of no exception. The most common types of disasters in Malaysia are landslide, flash flood and haze. This study explores the extent to which prior experience affects the level of preparedness among Malaysian communities before occurrence of natural disasters. Although previous studies have proven prior experience aided better handling of preparedness, yet some researchers have not found significant correlation between prior experience and preparedness. Having inconclusive results and with the rise of unexpected disaster events, has lead this present study to investigate the link in the Malaysian context. Questionnaire surveys were distributed to more than 1,000 respondents and face-to-face interviews were conducted with 12 local communities from Klang Valley, Malaysia. The results indicated that prior experience does contribute towards the level of disaster preparedness among the local communities in Malaysia. Hence, the findings of this present study may reduce the impact of disasters and thus could help local communities to effectively cope with the events of disasters.

**Keywords:** Prior experience; local communities; disaster risk preparedness; disaster risk reduction; Malaysia.

### 1. Introduction

Natural disasters occurrences are often unexpected, disrupt livelihood and caused huge economic losses. While urbanization is the potential driver of change and economic growth, climate change had resulted in more frequent and augmented the scale of natural disasters in the last decade (Thomas & López, 2015). Malaysia, like any other country, is affected by natural disasters and suffers from irregular hazards which can be disastrous, create calamitous damages and adversely influence the livelihoods of the affected communities. Malaysia's experience with the fatal earthquake at Mount Kinabalu in 2015, flood in Kelantan and Pahang in 2014, tsunami in 2004, frequent landslides, sinkholes and flash floods had prompted the nation to take precautionary measures to minimise the risk of disasters (New Straits Times, 2019).

Historically, local communities were seen as passive entities whose involvement in disasters/emergencies was only as receivers of assistance when disasters occur. Nevertheless, community participation has now been recognized as an important element in disaster management that is necessary to reduce the unpleasant consequences from disasters. The local communities used coping and survival strategies to face and respond to the chaotic situation before aids arrive. At the moment, the local communities in Malaysia lack a robust solution to cushion the effects of disasters. Therefore, in the interest of safety and wellbeing of the local communities, this study is needed to explore if prior experience with disasters could lead to better preparedness to pave way for disaster risk reduction efforts.

## 2. Review of Literature

Disaster preparedness is an initiative that is intended to increase readiness and knowledge among the various stakeholders regarding the risks, related agencies, preventive measures and other disaster related information (Dorasamy, Raman, Muthaiyah, & Kaliannan, 2010). Dorasamy et al., (2010) also highlighted that while undertaking insurance policies improved the level of preparedness towards disasters, the knowledge-based preparedness to face disaster was still inadequate. In line with this, disaster preparedness is perceived as a fundamental way to ensure disaster risk reduction, which is closely tied to the concept of flexibility (Baker & Ludwig, 2018).

Becker, Paton, Johnston, Ronan, & McClure (2017) highlighted that it is difficult to motivate household to prepare for earthquakes, given that earthquakes are infrequent and with varying magnitudes. However, the authors stressed that direct experience with disaster could be a strong motivator towards preparedness for hazard events. Experience with disasters had prompted community participation whereas those who had indirect experience with disasters could empathize in people, hence, prompted them to give a helping hand. Households who had experienced large-scale disasters, for example the Great East Japan earthquake in 2011, were largely more well prepared than others who experienced only small-scale disasters (Onuma, Shin, & Managi, 2017).

Becker, Johnston, Paton, & Ronan (2012) found that prior experience was an important motivator to encourage the preparation of emergency plan when natural disasters strike. Further evidences also pointed that vicarious experience (i.e. the disaster experience of others/information on the media) or hazard-related 'life' experiences were all indirectly related to preparedness levels. Hoffmann & Mutarak (2017) reported that education could play an important role in promoting disaster preparedness among individuals. Interestingly, it was pointed out that education promotes preparedness behaviours especially for those who do not have prior experience with disasters.

However, some studies have found only small or non-significant correlations between prior experience and preparedness. Chan, Kim, Lin, Cheung, & Lee (2014) conducted a study on the extreme poverty household in remote, rural and disaster prone communities in Gansu Province, China. The findings showed that there was a limited level of disaster preparedness among these extreme poor communities, although the communities had faced multiple disasters. The reasons given by the communities were "never occurred to me" or "wanted to but lacked the resources to do so". These responses revealed the community's perception towards risk faced and thus disaster preparedness may not be associated with prior disaster experiences. In addition, Takao et al., (2004) found that although Japanese were frequently in danger of disaster occurring, the level of preparedness remained inadequate.

## 2. Methodology

This study involved an exploratory phase and a detailed reflective phase with the aim to investigate if prior experience influences the level of preparedness of the local communities towards natural disasters in the Klang Valley. Klang Valley is the target of this study as almost 24% (or 7.78 million) of the total population in Malaysia are located in Klang Valley (Department of Statistics Malaysia, 2019). The quantitative approach by way of survey questionnaires were carried out to obtain information or data that were subsequently analysed using the Statistical Package for Social Science (SPSS). Convenience sampling had been utilized because it is easier to recruit respondents in answering and returning back the distributed questionnaires effectively and efficiently. Hence, large amount of completed questionnaires can be collected and more in-depth interviews could take place.

Approximately 1,500 sets of self-administered questionnaires were distributed to the respondents. The survey questionnaire was designed in simple English Language for the ease of understanding. It consisted of two main parts: Section A with demographic information and Section B which consists of construct measurements for prior experience. Five-point Likert scale (1 = Strongly Disagree; 2 = Disagree; 3 = Neither Agree or Disagree; 4 = Agree and 5 = Strongly Agree) were used to solicit the responses from the respondents.

In-depth interviews were also conducted after making appointment with the respondents. The in-depth interview guide consisted of two parts - the first part comprised of open-ended questions for prior knowledge constructs and the last part requested for the respondents' demographic profile. A total of 12 in-depth interviews were conducted with local residents and resident representatives to obtain their perception of the level of preparedness of the local communities towards the issue of natural disasters in the Klang Valley.

## 4. Findings

### 4.1 Descriptive Analysis

The background details of the respondents for the survey questionnaire and in-depth interviews are presented in Table 4.1 below. Out of a total of 1,500 survey questionnaires distributed, the usable questionnaire sets were 1,030 sets. The data showed the gender distribution of 34.6% male respondents as compared to 65.4% female

respondents for the survey questionnaire. On the other hand, the in-depth interview comprised of 7 male and 5 female interviewees.

Majority (69.3%) of the survey questionnaire respondents fall under the age group of 18 to 46 years old, whereas the in-depth interviews were with more senior local communities with a mean age of 44 years. Of the questionnaire survey respondents, 46.6% are working full time (employed), 29.6% students, 18.3% homemakers and the balance are retirees (5.5%). In contrast, 75% of the local communities interviewed are employed full time, 16.7% retirees and one student interviewee.

More than 70% of the respondents who participated in the survey questionnaire hold at least a Bachelor, Master/PhD or professional qualification. On the other hand, for the in-depth interviewees, 41.7% hold a Bachelor's degree, 33.3% with Diploma/SPM qualifications, 16.7% with Masters/PhD and the balance of 8.3% with professional qualification.

**Table 4.1: Background details of the respondents**

Variables	Survey Questionnaire		In-depth Interviews	
	Frequency	Percentage	Frequency	Percentage
<b>Gender</b>				
Male	356	34.6	7	58.3
Female	674	65.4	5	41.7
<b>Age Group</b>				
< 17 years	51	5.0	-	-
18-34 years	365	35.4	3	25.0
35-46 years	349	33.9	4	33.3
47-56 years	190	18.4	3	25.0
> 56 years	75	7.3	2	16.7
<b>Employment</b>				
Employed	480	46.6	9	75.0
Unemployed/Homemaker	188	18.3	-	-
Retired	57	5.5	2	16.7
Student	305	29.6	1	8.3
<b>Highest Education Level</b>				
Professional	320	31.1	1	8.3
Bachelor	385	37.4	5	41.7
Masters/PhD	17	1.6	2	16.7
Others: Diploma/SPM	308	29.9	4	33.3

#### 4.2 Prior Experience constructs

Table 4.2 presented the results from the survey questionnaires with respect to the central tendencies for the five constructs used to indicate prior experience of the respondents towards natural disasters.

The highest mean of 3.29 out of the 5-point Likert scale was attained by the statement "I understand the risk associated with the natural disaster in my area", where 52.7% of the respondents agree/strongly agree to this statement. On the other hand, the statement of "I fully understand the disaster warning and safe routes during emergency" recorded the lowest mean score of only 3.09. This could indicate that more activities are required to better educate the local communities with respect to the disaster warning and safe routes during emergency.

Besides, the statement of "I know how to respond to the emergency plan during to the natural disaster" shows that 48.6% of respondents agree/strongly agree, thus indicating less than half of the local communities have knowledge on what to do during the occurrence of natural disasters. Quite alarming is that approximately 30% of the respondents either disagree/strongly disagree to this statement, thus indicating that they are not sure what to do when natural disaster strikes.

Following these, the statements of “I am aware of my local warning protocols”, and “I have heard, seen or received relevant information about preparing for hazards or emergencies from media (e.g. television, radio, newspaper, etc.)” showed that more respondents agree to these statements and thus are not that disturbing.

**Table 4.2 Central tendencies measurement of prior experience**

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean (of 5-point Likert scale)
1. I know how to respond to the emergency plan during to the natural disaster.	3.0%	27.2%	21.2%	44.4%	4.2%	3.20
2. I fully understand the disaster warning and safe routes during emergency.	4.0%	25.8%	30.8%	35.9%	3.5%	3.09
3. I am aware of my local warning protocols.	4.6%	25.9%	26.9%	38.9%	3.7%	3.11
4. I have heard, seen or received relevant information about preparing for hazards or emergencies from media.	6.4%	19.9%	24.6%	42.6%	6.5%	3.23
5. I understand the risk associated with the natural disaster in my area.	4.3%	20.1%	22.9%	47.5%	5.2%	3.29

### 4.3 Reliability test and Pearson Correlation analysis

The reliability test on the prior experience and the natural disaster preparedness constructs showed satisfactory and acceptable levels, with Cronbach Alpha values of 0.882 and 0.779 respectively. Statistically, a Cronbach Alpha value that is greater than 0.6 represented acceptable level and if the value is 0.9 and greater, the strength is excellent (Zikmund, Babin, Carr & Griffin, 2013).

Pearson correlation analysis is a statistical analysis that used to determine the direction and intensity of relationship between independent variables and dependent variable. The range of correlation coefficient from -1 to +1; correlation coefficient can be either positive or negative, and the magnitude of the correlation coefficient indicates the intensity of the association. Pearson correlation analysis is one of the statistical analyses which used to determine the data of significance level of 95% or 99% in order to reject or accept null hypotheses. According to Sekaran & Bougie (2010), the interpretations of correlation size are presented in 5 levels, negligible correlation refers 0.0 to 0.2; low correlation refers 0.2 to 0.4; moderate correlation refers 0.4 to 0.7; high correlation refers 0.7 to 0.9; and very high correlation refers 0.9 to 1.0.

According to Table 4.3 below, prior experience showed a negative sign and is correlated tonatural disaster preparedness. Interestingly, these two constructs showed a significant relationship. Thus, the level of disaster preparedness among the local communities will be influenced by prior experience with natural disasters.

**Table 4.3 Pearson Correlation**

		Prior experience	Natural disaster preparedness
Prior experience	Pearson Correlation	1.000	-0.067*
	Sig. (1-tailed)		0.015
	N	1030	1030
Natural disaster preparedness	Pearson Correlation	-0.067*	1
	Sig. (1-tailed)	0.015	
	N	1030	1030

\* Correlation is significant at the 0.05 level (1-tailed)

#### 4.4 In-depth interviews with local communities

##### **Knowledge about natural disasters**

All the respondents have heard about natural disasters. Most agree that disasters are unpredictable, happens suddenly, trigger substantial losses/damages and at times, caused injuries to the individual/community. Flood, landslide and severe storm had been cited as the frequently encountered natural disasters in the Klang Valley.

Majority (9 out of 12) respondents have direct experience and the balance (3 out of 12) have indirect experience with natural disasters. Direct experiences with natural disasters is mainly with occurrences of flood. Indirect experience usually dealt with effects of flood that led to traffic congestions, damages to personal belongings (e.g. car) or unable to get access to their own homes. From the in-depth interview, especially for those who had direct experience with natural disasters, events of natural disasters had led to financial losses and mental stress as they do not know when it will happen again and notably worrying if heavy downpour, irrespective of day or night. All agree that events of flood are usually unexpected and happened very fast.

##### **Perception of natural disasters risk faced by the local community**

The local communities who participated in the interview felt that the low-lying areas in their neighbourhood and the vicinity with inefficient drainage system were the flood-prone areas. Some respondents cited that flood occurred due to developments in the surrounding areas (whether controlled or uncontrolled). Local communities who lived on higher grounds were less affected and usually only affected indirectly. Some respondents who were only incidentally affected showed nonchalant attitudes as they think that since the disaster had never happened to them, they do not think that they need to take any precautionary actions. However, those who had direct encounter stressed that they had exercised more caution, especially during the extreme weather conditions.

##### **Local warning protocols, emergency plans and disaster warnings of natural disasters**

All the respondents, except one, are not aware of any warning protocols during emergencies due to natural disasters. This revelation is quite startling since early warnings before the onset of disasters were really important in order to reduce the brunt of natural disasters. Interestingly, one respondent was confident that Malaysia has sufficient resources to tackle the emergency situation should a severe natural disaster occurs. The lack of awareness towards early warning and emergency plans lead one respondent to suggest that this should be taken as a sign to initiate one. Another respondent cited that rescue rangers from the authorities (e.g. MajlisPerbandaran) and people from outside the community affected by disaster were available to help out only after the disaster occurred. As a counter-action, the community collaborate with neighbours to watch and give warnings when flood happens or about to happen e.g. through calls or Whatsapp messages.

#### 5. Conclusion

Malaysia could no longer claim to be a disaster-free country as Malaysia had its fair share of disasters. Climate change and urbanization had contributed to more frequent and severe disasters. More actions should be in place to reduce the impact of disasters on the local communities. This present study is devoted to the perception that prior experience influences level of disaster preparedness among the local communities in the Klang Valley. It gives an insight to policy makers and standard setters to improvise their existing policies, rules and regulation to reduce the impact of natural disasters to the local communities. Consequently, there is a necessity to preach more on preparedness towards natural disasters through investments in infrastructure and identifying better evacuation routes. Moreover, clear communication strategies were needed in order to spread the importance of preparedness and clarify the steps to be taken in the event of disasters.

Future studies could also investigate other relevant variables such as coping strategy, volunteering and family disaster planning into the framework to examine preparedness level towards disasters. Further, a wide spread of data collection from disaster-prone location other than Klang Valley could be another area of interest to investigate in future.

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