UNIVERSITI PUTRA MALAYSIA

COMMUNITY KNOWLEDGE, ATTITUDE AND PRACTICE ON THE PREPAREDNESS OF EARTHQUAKE DISASTER IN RANAU, SABAH

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COMMUNITY KNOWLEDGE, ATTITUDE AND PRACTICE ON THE PREPAREDNESS OF EARTHQUAKE DISASTER IN RANAU, SABAH

BY

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Thesis submitted in fulfilment of the requirement for the degree of Bachelor Science (Environmental and Occupational Health) from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

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ABSTRACT

COMMUNITY KNOWLEDGE, ATTITUDE AND PRACTICE ON THE PREPAREDNESS OF EARTHQUAKE DISASTER IN RANAU, SABAH

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Introduction: Natural disaster has become a major global concern due to the expanding number of catastrophic events. Unlike flood, which is the most frequent natural disaster happening worldwide, earthquake is a disaster that can cause the highest total loss for the community and that particular country. It is the main cause of 55.7% death and USD232, 070 million worth of harm if compared to 22% of other natural phenomena. Earthquake can even trigger other tremendous disaster such as fires, tsunami and landslides. For countries located out from the pacific ring of fire such as Malaysia, where by fact should be free from this disaster, but in reality, there have been few episodes of earthquakes recorded. For instance, the 5.9magnitude happened in 2015 Ranau and Bukit Tinggi, Pahang back in 2007. This raise the issue of how well are Malaysian know and prepared of this unpredictable catastrophe? **Objective:** This study aims to determine the level of the community's knowledge, attitude and practice (KAP) towards the preparedness of earthquake disaster in Ranau, Sabah. **Methods:** In this cross-sectional study, 104 respondents completed a set of modified questionnaire consisting 53 questions altogether. The questionnaire was distributed through convenient sampling among the community in 5 selected villages in Ranau but it must meet certain requirements. **Result:** The findings of the study found out that there are moderate level of KAP among the community with no significant association among the variables as all the p-values are >0.05. However, some socio-demographics factors (age, level of education, duration of residency and prior experience to earthquake) shows a strong significant association with knowledge and practices on earthquake preparedness. **Conclusion:** Since a moderate level of KAP obtained among the community (47.1%, 74% and 66.3% respectively), the authorities should formulate a better disaster management and mitigation as well as to improve their risk communication to the public. The authority might can consider the ideas from the respondents obtained during the questionnaire survey as to ease the effective strategies and process to approach the community to deliver the knowledge and trainings.

Keywords: Community, Knowledge, Attitude, Practice, Earthquake Preparedness

ABSTRAK

PENGETAHUAN, SIKAP DAN PRAKTIS PERSEDIAAN KOMUNITI TERHADAP BENCANA GEMPA BUMI DI RANAU, SABAH

JOANITA JONIS

Pengenalan: Bencana alam semula jadi merupakan isu global disebabkan oleh peningkatan peristiwa bencana yang direkod. Berbeza dengan musibah banjir yang merupakan bencana alam semula jadi yang tertinggi dicatat di seluruh dunia, gempa bumi pula merupakan bencana yang mencatat jumlah kerugian tertinggi. Komuniti merupakan golongan yang sering menanggung kerugian besar selain ekonomi negara turut terjejas. Gempa bumi merupakan penyebab utama kepada 55.7% kematian dan kerugian sebanyak USD232, 070 million jauh lebih tinggi jika dibandingkan dengan 22% bencana semula jadi yang lain. Hal ini kerana, gempa bumi boleh mencetuskan bencana yang lebih besar seperti kebakaran, tsunami, dan tanah runtuh. Bagi negara yang terletak di luar rintangan api pasifik seperti Malaysia, bencana sedemikian sepatutnya tidak berlaku, tetapi realitinya, Malaysia telah pun merekod beberapa episod gempa seperti insiden 5.9 magnitud di Ranau, Sabah (2015) dan Bukit Tinggi, Pahang (2007). Persoalannya, sejauh manakah rakyat Malaysia tahu dan bersedia akan bencana gempa bumi? **Objektif:** Kajian ini bertujuan untuk mengkaji tahap pengetahuan, sikap, dan praktis komuniti terhadap persediaan menghadapi gempa bumi di Ranau, Sabah. **Metodologi:** Kajian keratan rentas ini melibatkan 106 responden yang mana mereka perlu melengkapkan satu set borang kaji selidik yang mengandungi 53 soalan dan telah diubah suai dari beberapa sumber. Borang kaji selidik telah diedar dengan menggunakan kaedah persampelan mudah kepada komuniti di 5 kampung terpilih, namun, responden tersebut mestilah memenuhi kriteria yang telah ditetapkan. **Keputusan dan Perbincangan:** Keputusan mendapati bahawa pengetahuan, sikap dan praktis komuniti adalah pada tahap sederhana dan tiada perhubungan signifikan dengan pembolehubah memandangkan kesemua nilai p adalah >0.05. Namun, beberapa faktor sosiodemografik (umur, tahap pendidikan, jangka masa menetap dan pengalaman gempa bumi) menunjukkan perhubungan yang sangat kuat dengan pengetahuan dan praktis. **Kesimpulan:** Memandangkan pengetahuan (47.1%), sikap (74%) dan praktis (66.3%) pada tahap yang sederhana, maka, pihak berkaitan perlu merangka pelan pengurusan bencana dan mitigasi yang lebih baik kepada komuniti. Cadangan yang telah diberikan oleh responden dalam borang kaji selidik juga perlu dipertimbangkan agar strategi dan proses mendekati komuniti untuk menyampaikan pengetahuan dan latihan berkaitan persediaan menghadapi bencana menjadi lebih mudah dan berkesan.

Kata kunci: Komuniti, Pengetahuan, Sikap, Praktis, Persediaan Gempa Bumi

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WHO	World Health Organization
USD	United States Dollar
USGC	United States Geological Survey
EM-DAT	Emergency Database
UNEP-APELL	United Nations Environment Program- Awareness and Preparedness for Emergencies at Local Level
FEMA	Federal Emergency Management Agency
IFRCRCS	International Federation of Red Cross and Red Crescent Societies
EPA	Environmental Protection Agency
UN	United Nation
ISDR	International Strategy for Disaster Reduction
ICN	International Council of Nurses
ICDO	International Civil Defence Organisation
GPS	Global Positioning System
MST	Malaysian Standard Time
Kg	Kampung

IBM SPSS	International Business Machine Statistical Package for Social Sciences
JKEUPM	Ethic Committee For Research Involving Human Subject
JKKK	Jawatankuasa Keselamatan dan Kemajuan Kampung

CHAPTER 1

INTRODUCTION

1.1 Research Background

In this millennium era, there are lots of environmental disaster happened. It is a phenomenon that occur unexpectedly even though part of it can be predicted (Haliza & Rapeah, 2018). The repeated events may leave a strain on the people's lives and indirectly affecting their life productivity. In fact, seldom in a week goes by where a significant disaster is not appear in the media – a disaster which leads in death and demolitions (Sinha, Pal, Kasar, Tiwari, & Sharma, 2008).

But what is a disaster? 'Disaster' is originally from French word "Desastre" that combine two words, 'des' means bad and 'aster' means star. Therefore, it refers to 'Bad or Evil Star' (Adnan et al., 2015). The World Health Organization (WHO, 2007) defined disaster as a severe disruption in a functioning community or society resulting widespread human, material, economic and environmental losses that limits the ability of the affected community or society to deal using their own resources'.

Meanwhile, the Malaysian National Security Council Directive 20 interpret disaster as an event that interfere human's and nation's activities as it may cause life loss, properties damage, economic loss and environmental destructions. Hence, it requires extensive mobilization of sources (Malaysian National Security Council Directive 20, 2012).

Basically, environmental disaster is divided into two categories; natural disaster and manmade disaster (Haliza & Rapeah, 2018). Natural disaster is the disaster that happens in accordance with the nature due to natural factors such as volcano explosion and earthquake. It is frequently described as the "Act of God" (Shaluf & Ahmadun, 2006). Meanwhile, manmade disaster happened due to humankind. For instance, the flash flood and acid rain. The result may be due to human activities either intentionally or unintentionally until it gives negative impacts to the surrounding environment.

Disaster results to a chain of reaction (Adnan et al., 2015). Earthquake for example is one of the most dangerous natural disaster on Earth as it may lead to tsunami, landslide and soil liquefaction (Adnan et al., 2015). It is known as the shaking of Earth due to the movement of waves under the Earth's surface and resulting tremors vibration, surface faulting, landslide, liquefaction aftershocks and/or even tsunami (WHO, 2016). Earthquake disaster have been proven to be the most terrifying and high-cost disaster which contribute to a serious threat to a

country's infrastructure, population, economy, and social structure (Baytiyeh, 2014). In the first decade of the 21st century, 4,022 natural disaster have been reported, 284 (7%) were earthquakes (Taghizadeh et al., 2012).

Even though it contribute a small share among the number of disasters, earthquakes are the main cause of 55.7% death and USD232,070 million worth of harm if compared to 22% of other natural phenomena (International Federation of Red Cross, 2011). 85 percent of people exposed to earthquakes, tropical cyclones, floods and droughts live in countries with either medium or low human development and more than 95% of all deaths due to disaster happen in developing countries while economic losses are focused in developed world (Adnan et al., 2015).

Based on global record since 1900, one earthquake with magnitude of 8 or greater, 15 earthquakes with magnitude 7-7.9 and 134 earthquakes with magnitude 6-6.9 on the Richter scale are predicted each year. The number of huge earthquake has remained constant, but, because of the growing number of seismological stations, the number of tiny earthquakes which is magnitude lesser than 6 has increased annually (USGS, *n.a*).

The Murphy's law on natural hazards claims that anything that can go wrong, will go wrong (Otolo, 2014) and it describes the world's largest recorded earthquake in 20th century with 9.5 magnitude happened on May 22, 1960 near Valdivia,

Southern Chile. The tremendous event is also known as the "Great Chilean Earthquake" and the "1960 Valdivia Earthquake". The victims suffered huge number of life and property loss due to series of tsunamis that were initiated by the earthquake (Geoscience News and Information, 2018).

Kishore (2003) highlighted that Asia Pacific are among the high prone countries to expose with many types of natural hazards. For instance, the recent news on earthquake with a magnitude of 7.5 hit the Sulawesi Island in Indonesia and triggered a tsunami on September 28, 2018. The quake killed more than 400 human lives and 350,000 people lost their homes (Chavez & Andri, 2018). According to Disasters Report 2012, the number of affected population was seen to be increased of 14% while 39% rise in death toll as the outcome of both natural and manmade disasters in the past decade (Xu et al., 2015). Emergency preparation and fast self-help measures of the local community is very crucial for disaster victim survival (Xu et al., 2015).

1.2 Problem Statement

Asia Pacific countries are the most vulnerable area for geological hazards (for instance; earthquake, tsunami and volcanic eruptions), hydro-geological hazards like floods and droughts and other types of hazards such as cold waves, forest fires as well as epidemics (Shaluf & Ahmadun, 2006). Even though study have confirmed that Malaysia is an earthquake-free country, but due to obvious phenomena change over the past few years, the belief that Malaysia is a seismic free is totally the opposite with the current situation that the Earth experience (Marto, Kasim, Soon, Zurairahetty, & Yunus, 2013).

Since December 2004, Malaysia has experiences multiples of quake tremors which occurred because of the Sumatra Andaman and Philippine earthquakes (Majid et al., 2017). Malaysia is located at a tectonically stable crust of Indosina-Sundaland and surrounded by active seismically zone equivalent to 350km away (Marto et al., 2013). There have been few cases recorded locally and yet the public are still unaware of it such as the 2007 Bukit Tinggi, Pahang earthquake. However it did not results any serious damages (Majid et al., 2017). Until the quake episodes in Ranau, Sabah on June 5th, 2015, a 5.9 quake magnitude was recorded which have claimed 18 human lives (Tam, 2015) and physically damages many buildings. To reduce the damage or loss due to earthquake, some preparedness measures can be applied, yet people in developing and developed countries do not use these actions fully (Taghizadeh et al., 2012).

There have been a number of researchers discussed on the regional tectonic setting while many others look into the potential of future earthquake events via genuine scientific study, however it is still lacking in the study of community's knowledge, attitude and practices on preparing themselves for the catastrophic earthquake since the mentality norm of the community are still left behind due to the belief that Malaysia is exceptional from the disaster. The communities should be prepared with education, public awareness, and a better understanding of the natural disaster in such a way that the effects and risks can be eventually reduced (Bakar, Jamaluddin, Omar, & Razak, 2013).

In Malaysia, earthquake is considered as a rarely happening event, hence, there is no awareness program among publics, lack of disaster warning system, and no subjects related to earthquake offered at secondary school or even at higher level of education (Adnan et al., 2015). The 2004 Sumatran earthquake of 9.3 magnitude has triggered tsunami killing 283,100 people from 14 countries including 68 people died in Malaysia (Adnan et al., 2015). Hence, Malaysia should learn the preparedness measures with such disaster, because some disaster events might not emerge from this country but also from nearby countries (Adnan et al., 2015). Thus, this research is critically needed to be conducted to access the public's view regarding earthquake disaster and to be able to improvise the nation's disaster management which may minimize the impacts of the disaster especially to the human lives.

1.3 Research Justification

Unlike Indonesia and Philippines, Malaysia should be safer from earthquakes. This is because Malaysia located outside the Pacific Ring of Fire (Noor, 2018). However, Malaysia has to be watchful as the growing number of natural disaster incidences for the past few years are worrying. Even though Malaysia sits outside the Ring of Fire, but the consequences of the quakes can sometimes be felt (Noor, 2018).


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GEMPA HAMPIRI MALAYSIA

» Sesar aktif berhampiran negara mampu bawa kemusnahan

Figure 1.1 Malaysia is at risk of earthquake disaster

Source: Berita Harian (2 November 2014)

Generally, there are many researches done on earthquake in Malaysia, however, research that is specifically aimed to access knowledge, attitudes and practice of the community towards disaster preparedness is still lack. There is a need to carry out this research because the outcome may provide the baseline data and use as a support to develop an effective risk communication strategies and education programs for the public.

Ranau, Sabah is chosen as the research location because the area is highly prone to earthquake event in Malaysia. The 2015 earthquake which is believed to be the greatest quake ever happened in Malaysia shocked the whole nation when the moderate quakes of 5.9 magnitude hit with epicentre at Ranau, Sabah (Majid et al., 2017). The tremors were also experienced in Kundasang, Tambunan, Pedalaman, Tuaran, Kota Kinabalu, and Kota Belud (Majid et al., 2017).

From the incident, the community are the most affected group as they have to bear with all the consequences they encounter due to the disaster. Based on the last 113 years of global record, the number of people died due to earthquakes and tsunamis are more than 2.6 million and approximately 174 million people were affected (EM-DAT, 2013). The government started to realise the need to formulate and implement Earthquake Awareness Programme in school curriculum especially in Sabah (Jiffar, 2018). Hence, the previous Prime Minister's Department Datuk Seri Abdul Rahman Dahlan, stressed that it is very crucial to reduce public panic and prepare them knowledge on appropriate action to be taken when the natural disaster happen (Jiffar, 2018). However, the problems may remain over the quality of data and research. Knowledge should be prepared to enable access of the correct practice in time of earthquake and strengthen the preparedness level of the community to face the unpredictable earthquake.

1.3 Conceptual Framework

Figure 1.2 is the overview of this study. The conceptual framework summarize on the community in Ranau, Sabah focusing on the safety and health aspects whenever a disaster strikes. There are two types of disaster outlined by UNEP-APELL (2003), WHO (2003a, b), FEMA (2003), IFRCRCS (2003), Directive 20 (2003), Hood and Jackson (1992), Richardson (1994) and Turner Pedgeon (1997); the manmade disaster and natural disaster. Manmade disaster happen because of human ignorance and related with human and industrial activities. Meanwhile, natural disaster are the series of disaster that occurred beyond human capabilities of predicting (Adnan et al., 2015). In this study, natural disaster will be discuss specifically on the earthquake. It was presume that the attitude and practice of the Ranau community may be affected by the level of knowledge possess by them.

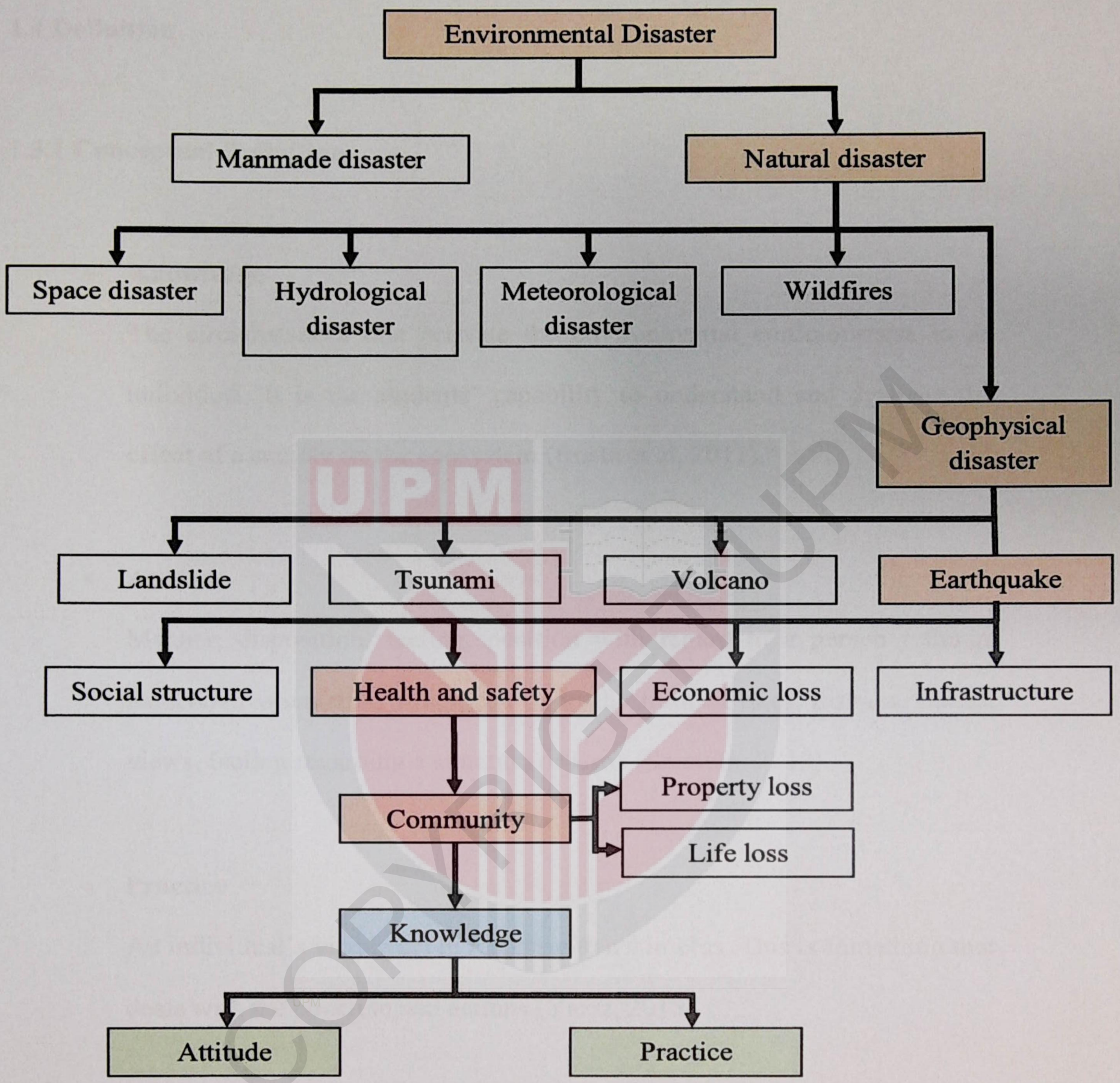

Figure 1.2 Conceptual Framework

1.4 Definition

1.5.1 Conceptual Definition

- **Knowledge**

  The circumstances that activate the environmental consciousness in an individual. It is the students' capability to understand and evaluate the effect of a society on the ecosystem (Rosta et al, 2011).

- **Attitude**

  Manner, disposition, feeling, position with regard to a person / things tendency / orientation which can be in the form of likes, dislikes, biases, views, feeling regarding a situation or issue (Sammut, 2013).

- **Practice**

  An individual's visible act in response to a stimulus. This is something that deals with the concrete and actions (Yaziz, 2015).

- **Community**

  A group of people with multiple characteristics who are related by social relationship, share the same view, and engage in joint action in a geographical locations or settings (Green & Mercer, 2001).

- **Socio-demographic**

  Socio-demographic can be identified from the combination of sociological and demographic criteria. For intense; age, gender, race, education level, marital status, etc (Adilah, 2017).

- **Preparedness**

  The stages or states of an individual, collective and organizational context despite to reduce the injuries due to the occurrence of an event (Ranjbar, Soleimani, Sedghpour, & Shahboulaghi, 2018).

- **Environmental Disaster**

  Related with different types of environmental processes and systems such as geo-morphological, topographical / landscape, atmospheric / climatic, geo-chemical, edaphic, hydrological, hydrological, hydrodynamic, features, as well as the human activities inclusive the industrialization / urbanization (EPA, 2014).

- **Earthquake**

  The shaking of Earth because of the movement of waves under the Earth's surface and end up with tremors vibration, surface faulting, landslide, liquefaction aftershocks and/or even tsunami (WHO, 2016). It can be measured using the earthquake Richter scale known as the seismometer (Scientific American, 2005).

1.5.2 Operational Definition

- **Knowledge**

  Knowledge level was evaluated by using modified set of questionnaire consisting 16 general information about earthquake. The questions were in the form of close-ended question provided with option Yes or No. The individual then classified into good, medium or poor knowledge on earthquake.

- **Attitude**

  Attitude was evaluated through a modified set of questionnaire consists of 13 questions. The questions were in likert-scale form with a scale of 1 (strongly disagree) – 5 (strongly agree). From the result, the participants were categorized into high, medium and low attitude.

- **Practice**

  Practice was evaluated via modified set of questionnaire consisting 13 Yes or No questions. Then the result obtained was classified into good, medium or poor practice on the preparedness of earthquake.

- **Community**

  The people who participated and affected by in this research outcome, which is the lay residents of a local area.

- **Socio-demographic**

  Socio-demographic factor was measured by using a modified set of questionnaire consisting questions such as race, age, gender, education level, duration of residency, marital status, occupation, and monthly income.

- **Preparedness**

  It involves the planned action taken by the community / individual on how to respond to a situation.

- **Environmental Disaster**

  Manmade disaster / natural disaster that can cause destruction to the nature and result disease, loss and death of living things as well as loss of property.

- **Earthquake**

  Earthquake can be determined from asking the respondent's experience on earthquake and the frequency of them have experience earthquake throughout their life.

1.6 Research Objectives

1.6.1 General Objectives

To determine the level of knowledge, attitude and practice among Ranau community on the preparedness of earthquake disaster.

1.6.2 Specific Objectives

i. To determine the distribution of socio-demographic factors among community in Ranau, Sabah.

ii. To determine the association between knowledge and attitude toward earthquake disaster among community in Ranau, Sabah.

iii. To determine the association between knowledge and practice for preparedness of earthquake disaster among community in Ranau, Sabah.

iv. To determine the association between attitude and practice for the preparedness of earthquake disaster among community in Ranau, Sabah.

v. To determine the association between socio demographic factors (age, level of education and prior experience on earthquake) and practice on earthquake preparedness.

vi. To determine the association between duration of residency and knowledge on earthquake among the community.

vii. To obtain the suggestions on earthquake preparedness measures from the community.

1.7 Research Hypothesis

i. There is a significant association between knowledge and attitude on earthquake disaster among community.

ii. There is a significant association between knowledge and preparedness practice in time of earthquake disaster among community.

iii. There is a significant association between attitude and practice for the preparedness of earthquake disaster among community in Ranau, Sabah.

iv. There is a significant association between the socio demographics factors with the preparedness practice on earthquake disaster.

v. There is a significant association between duration of residency with the knowledge level on the earthquake disaster.

CHAPTER 2

LITERATURE REVIEW

2.1 Overview of disaster

Disaster is as old as the human history but the significant increase and harmful outcome make it become the global concern issue. Based on the National Security Council Directive No. 20, disaster is defined as an incident that happens unexpectedly and eventually derive in the loss of lives, damage to properties and environment. These result may lead to the disruption in daily activities of the local community. Hence, it requires resources mobilization actions extensively and cooperation from many different agencies as well as the possibility of taking complex actions over a long time. In general, it can be define as a severe destruction in a working community which chapter 4s loss of thousands of lives, damage to environment and property which restrict them to use their own resources.

Disasters happen erratically with no discrimination in such an immediate manner (Adnan et al., 2015). A disaster can end up with combination of hazard, vulnerability and insufficient capacity to reduce the probability of chances of risk. A disaster to be key in into the database of the UN's International Strategy for Disaster Reduction (ISDR) must met at least one of the criteria; a report of 10 or more people killed, a report of 100 people affected, a declaration of a state of emergency by the relevant government, and a request by the national government for international assistance (Sørensen, Vedeld, & Haug, 2006).

Disaster can be classified into two types: Firstly, natural disaster. This is the type of disaster cause due to natural phenomena. It happens naturally such as the cyclones, tsunamis, earthquake and volcanic eruption. The second one is the manmade disaster. Manmade disaster happen because of human activities mainly associated with industries and energy generation facilities (Mustaffa, Marzuki, Khalid & Sakdan, 2018). For instance, explosion, leakage of toxic waste, pollution, dam failure, wars as well as civil strife.

However, there is also called socio-natural hazard like the landslide, floods, drought, fires because it might happen naturally or due to human acts. No matter the types of events, the incidents have a high tendency to cause severe loss of life and physical demolition and might leave the communities in shock and emotional distress due to the unexpected loss that they have to face (Johnson, 2017).

2.2 Impacts of natural disaster

The Earth has been weathered with series of disasters over the past centuries. In fact, the world is currently challenged with the growing frequency and magnitude of natural and man-made disasters which leave catastrophic impacts (Srinivas, 2015). The worldwide disasters are happening oftentimes, and the Asia-Pacific region is one of the most terribly influenced, leading to high numbers of life loss, injuries, economic loss and environmental harm (Usher & Mayner 2010). Some catastrophes have been exacerbated due to human development (Liu & Diamond, 2005). Wherever disaster occurs, the impact on population and communities may be destructive, despite the nation, region, or community immune (International Council of Nurses (ICN), 2009). Despite with both types of disaster, it has undeniably leave impacts in every country in the world and its population (ICDO, 2018).

2.2.1 Effects on Human Life (Society)

Based on the report from the secretariat of the International Strategy for Disaster Reduction (ISDR), 478 100 people killed with more than 2.5 billion people affected (Srinivas, 2015). As stated in pervious journal, death and injuries are the main effects the community have to face when a disaster strikes, however, other temporary or permanent migration, panic and social disruption are also among the consequences the community experience with (Oreto & Marti, 2012).

In short, natural disaster will definitely record a high number of mortality (Adnan et al., 2015). The International Federation of the Red Cross and Red Crescent Societies (IFRCRCS) in 2013 have reported that there are more people have been displaced by natural disaster compared to war (Sørensen et al., 2006). Apart from that, victims of disaster would be challenged mentally due to the trauma they encountered during the disaster. Being traumatized can affect the health of a person including the national and community stability as overall (Ursano, McCaughey & Fullerton, 1995).

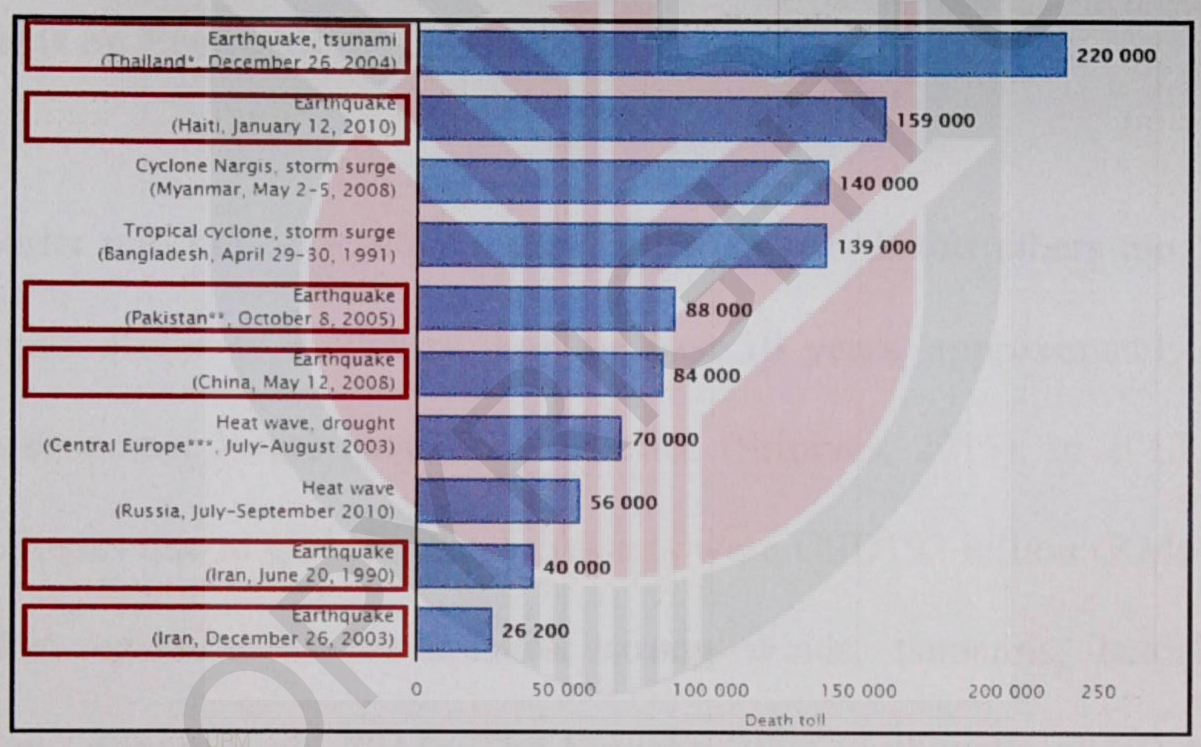

Figure 2.1 Series of significant natural disaster worldwide by death toll from 1980 to 2017

Source: The Statistic Portal, 2018

2.2.2 Effects on Property and Environment

Properties are not spared whenever a devastating event happen. It is believed that immediate effects on property and social such as loss of housing, disruption on market which can indirectly ruin income source of the victims (Adnan et al., 2015), communication breakdown as well as social disruption (Oreto & Marti, 2012). At the same time, that particular area will be at high risk of fire, landslide, and tsunami (WHO, 2018).

2.2.3 Effects on Economic

Disaster will not only affect a party but also will distort others too, including the economic sector of a country. For the past 10 years, approximately US$ 690 billion in economic losses have been recorded (Srinivas, 2015). In 2013, the total economic losses due to global natural disasters were USD192 billion (RM613 billion) due to 296 episodes of earthquakes, strong winds, tsunamis, landslides and liquefaction (Adnan et al., 2015). The Sumatra 2004 earthquake of 9.0 magnitude which have triggered a devastating tsunami have submerged a village in the north of Mauritius. Huge loss in terms of economic was felt the total loss were estimated have reached millions of dollars (Ramalanjaona & Georges, 2011).

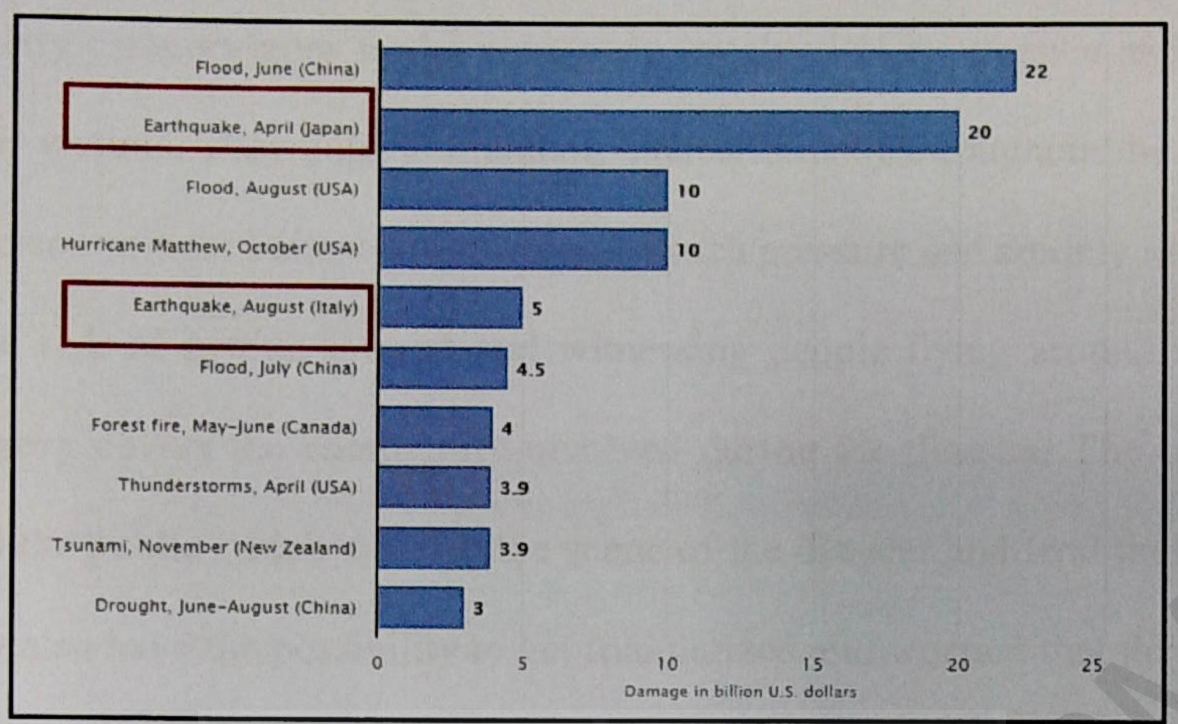

Figure 2.2 The ten natural disasters with the most economic damage in 2016 (values in billion U.S. dollars)

Source: The Statistic Portal, 2018

2.3 Categories of Disaster Victims

Victims of disaster can be classified into few categories. Primary victims are those who exposed directly to the disaster. Hence, they have maximum exposure to it compared to the other groups. Usually, victims who survived in a disaster will experience an immediate psychological effect and requires long term aid and attention. Secondary victims consist of the family and friends of the primary victims. They normally were on the scene of the event and felt the loss and stress together (Mustaffa, Marzuki, Khalid & Sakdan, 2018).

Tertiary category goes to the volunteers involved in emergency and rescue of the disaster victims. They need to maintain their efficiency throughout the operation. The rescue committees believed to experience such pressure and anxiety as they have to face the risk of getting injured and witnessing people dying around them. The forth category covers the community involved during the disaster. The community include all the public which were on the scene of the disaster and lend their hands to help. They also have the possibility to get traumatized and worried that they might as well experience the same thing. Fifth category is those who feel emotional disturbance although they are not directly involved with the disaster. Lastly, is those who have the possibility to be the victim but luckily saved from the disaster (Mustaffa, Marzuki, Khalid & Sakdan, 2018).

2.4 Earthquake

Earthquake is also known as the Earth's seismic activity (Erickson, 2018). The word 'earthquake' is defined as the sudden movement of the Earth's rocky surface which is normally happen when the Earth's surface detached (Haliza & Rapeah, 2018). Meanwhile, World Health Organization (2018) defined earthquake as the shaking of Earth due to the wave movement under the Earth's surface that will end up with tremors vibration, surface faulting, landslide, liquefaction aftershocks and/or even tsunami.

The most catastrophic of earthquake event in the 20th century is the "Great Chilean Earthquake" occurred on May 22, 1960 in the southern Chile. With a magnitude of 9.5 by the United States Geological Survey, approximately 2, 000, 000 Chilean became homeless (Geoscience News and Information, 2015). Meanwhile, in Southeast Asia, a 7.5 magnitude of earthquake shocks the Indonesians in Sulawesi Island as it have also triggered a tsunami on September 28, 2018. More than 400 human lives killed and 350,000 people left homeless due to that event (Chavez & Andri, 2018).

Table 2.1 Examples of earthquake and its impacts

Year	Location	Magnitude	Impacts
2004	Indian Ocean (Ramalanjaona & Georges, 2011)	9.0	• Triggered tsunami • 18 countries in Southeast Asia and Southern Africa affected • 250, 000 death in a day • 1.7 million homeless • Million dollars of loss affecting fishing and tourist industries • Water pollution and flooding and endemic disease
2015	Ranau, Sabah (Tongkul, 2017)	5.9	• 18 climbers died • Physical damage on public and private buildings • Rock falls and landslide • Liquefaction
2019	South Texas (Ramon, 2019)	2.6	• No damage and injuries

2.5 Occurrence of Earthquake

The Earth consist of four layers; a solid crust, a hot and nearly solid mantle, a liquid outer core, and a solid inner core. The solid crust which is also the surface of the Earth covered with a lithosphere region in the form of giant puzzle known as the tectonic plates. There are 7 main plates; African Plate, Antarctic Plate, Eurasian Plate, Indo-Australian Plate, North American Plate, Pacific Plate, and South American Plate (Neild, 2010). These plates will keep on moving or shifting on the viscous or slow flowing, mantle layer at the bottom (Erickson, 2018).

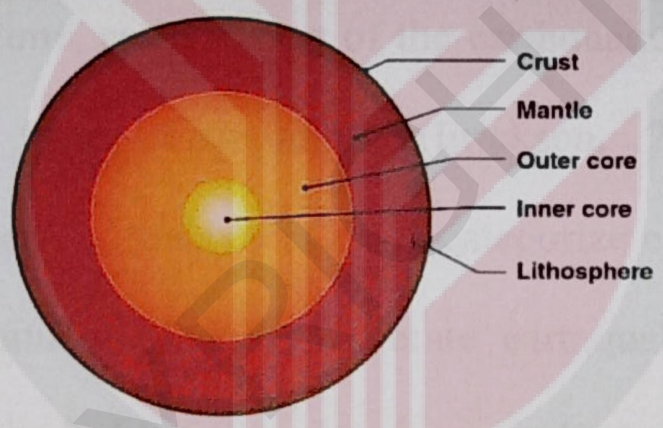

Figure 2.3 The diagram of the Earth's layers

Source: Erickson, 2018

Earthquake starts with the release of energy in the rocks clustered around a fault that divides tectonic plates. The friction held the rocks in its original place, however, due to the motion of the plates, the rocks around the fault eventually will bend and stretch. So, the rocks then become like a compressed springs, with energy stored until the friction across the fault is no longer can hold the rocks together, resulting a crack across the fault and begins to slip. Hence, part of the stored energy

is release while some other creates the seismic waves that transmit to the surface and cause harm. The starting point of the earthquakes is known as the epicentre (Erickson, 2018). The disaster will only stop when there is no more enough energy to keep them going. In short, the energy released from the sliding fault must be fundamental enough to crack the friction holding the rocks in place (Greenemeier, 2008).

Charles Richter an American seismologist developed the earthquake Richter scale in 1935. The earthquake magnitude can be summarize into an easier way to remember and analyse using single-digit number – magnitude 3 (tiny earthquake); magnitude 6 (may cause significant harm); 9 (may cause extreme destruction). Secondly, the strength, time, and location of the earthquake can also be determined through the readings from seismometer (Erickson, 2018). Meanwhile, the Meteorological Department of Malaysia (2019) categorize earthquake into 4 groups; weak earthquake (magnitude 1.0-4.9), moderate earthquake (magnitude 5.0-5.9), strong earthquake (magnitude 6.0-6.9) and major magnitude (magnitude 7.0-10.0).

Earthquake is detectable by using seismometer although the location is not particularly near to the fault. Modern seismometer can even record earthquake at 5 magnitude and above that happening around this globe (Scientific American, 2005).

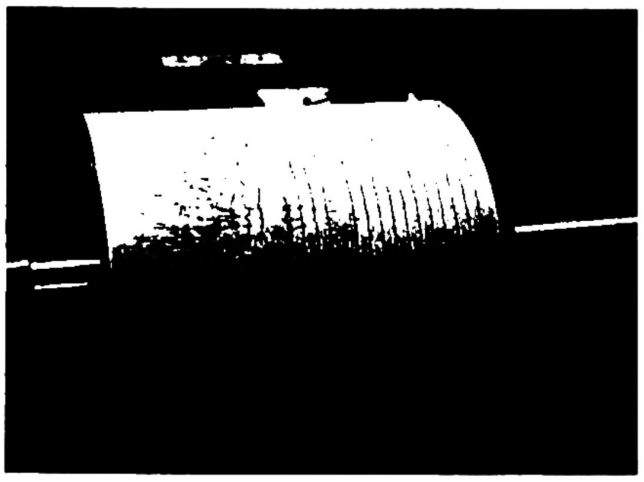

Figure 2.4 Seismometer record seismic waves in the form of zig-zags

Source: Erickson, 2018

2.6 Malaysia and Earthquake

Malaysia (329, 750 km^2) of 23, 522, 482 population is located in the tropical region of South-East Asia. Malaysia is characterized as the region with heavy rain almost throughout the year and it is rich in tropical forest. However, Malaysia have experienced few times of natural disaster like landslide, mudslides, floods due to heavy rain (Shaful &Ahmadun, 2006). In facts, Malaysia have also experienced earthquakes over the past years but it is mostly due to the quakes happening at nearby the country.

Table 2.2 Examples of earthquake that have affected Peninsular Malaysia

Date	Epicenter	Magnitude	Effect on Malaysia
19/5/2005	Nilas	6.9	Penang, Kuala Lumpur, Sungai Ara, Tanjung Tokong
24/7/2005	Nicobar Island	7.2	George Town
17/12/2006	Northern Sumatera	5.8	Kuala Lumpur, Singapore
12/9/2007	Southern Sumatera	8.4	Setapak, Cheras, Pudu, Langkawi, Johor Bahru, Malacca
30/9/2009	Padang	7.9	Kuala Lumpur, Putrajaya, George Town, Johor Bahru
9/5/2010	Northern Sumatera	7.2	Sungai Dua, Penang
14/6/2011	Northern Sumatera	5.6	Selangor, Malacca, Perak, Putrajaya, Negeri Sembilan
11/4/2012	Northern Sumatera	8.2	Penang,Kuala Lumpur

Source: (Marto et al., 2013)

Earthquake have started to hit Malaysia since 1984 with 94 records in Sabah, 21 in Sarawak and 31 incidents in Peninsular. Theoretically, Malaysia lies safely in tectonic stable crust, Indosina-Sundaland and surrounded by 350km away from active zone of seismic activities. However, Malaysia will not forever stay immune to seismic risk as there have been study on the regional setting out and the possibilities of future earthquake events based on reliable scientific investigation (Marto et al., 2013). Moreover, Malaysia is very close with the neighbouring country where the

active faults is, affecting Malaysia, hence, is not spared from the quakes (Khoiry, Hamzah, Osman, Mutalib, & Hamid, 2018).

2.7 The Ranau Earthquake

Sabah located at the criss-crossing of three main tectonic plates; Eurasian, Indian-Australian, and Philippine-Caroline-Pacific plates respectively at the northwest, south, and east side of Sabah (Tongkul, 2017). According to GPS measurements, the Eurasian plate move to southeast at the rate 3-5cm every year, the Philippine plate move westward with 7-10cm yearly, and the Indian-Australian plate with 5-7cm in a year. The intersection of the 3 main plates causes huge incidents of volcanoes and earthquakes while Sabah is only around 1000km from the Philippine Trench and Eurasian-Philippine plate boundary respectively. Sabah is on the semi-stable South China Sea region, however, it is still affected by the active mobile belts of Sulawesi and the Philippines (Tongkul, 2017).

The deadly 5.9 magnitude of a 30-seconds earthquake happened on June 5, 2015 at 7.15am Malaysian Standard Time (MST) with estimated depth of 10km at the coordinates 6.0°N 116.6°E (Meteorological Department, as cited in Yusa, 2015) of Ranau, Sabah. It was the strongest vibrations that have struck Malaysia since the 1976 Lahad Datu earthquakes (Tongkul, 2017). The incident's epicentre happened at a distance of 19 km (12 miles) from Ranau town and 54 km from Kota Kinabalu. Eighteen Mount Kinabalu climbers (10 Singaporean students and teachers, 2

Malaysian climbers, 4 local mountain guides, and one climber from Japan and China respectively) (Sario, 2016) died, 130 injuries as well as building structures were also badly affected (Yusa, 2018).

Within the 3 months after the main shock, there were 120 aftershocks recorded by Meteorology Malaysia. However, only 5 events that exceed magnitude 4 (Tongkul, 2017). The whole Sabah were affected by the tremors, and some parts of Labuan, Miri in Sarawak and Brunei. The most recent earthquake event happened earlier last year on March 9, 2018 with a magnitude of 5.2 also epicentre at Ranau. The vibration also felt at Kota Kinabalu, Kundasang, Penampang, Tuaran, Kudat, and Kota Marudu (Bernama, March 9, 2018).

2.8 Knowledge, Attitude and Practice

Due to the realization in natural concern, the natural problem extremely non-stop highlighting the main variables on ecological assurance. For instance, the environmental behaviour, awareness, knowledge and attitude (Ayush, 2008). The researcher believed that knowledge and attitude are interconnected with each other in which attitude is also associated with behaviour (Flamm, 2006).

Ecological instruction can further the attitude and knowledge on the environment where it is crucial to manage the issues (Department of the Environment and Heritage, 2005). Fahlquist (2008) in his previous study claimed

that when people are knowledgeable about the environment issues and its consequences, they will have sufficient information on the related problems regarding the environment. Hence, they will be more encourage to handle the environment with care.

It has been proven for decades that development of a good knowledge, attitude and practice of an individual can be achieve from environmental education. This is because, awareness and comprehension of connection among people and their surroundings begins from the environmental education (Hafezi et al., 2013).

There is also a fact that the attitude and external factor will be connected with each other to affect the behaviour. However, at some point, attitude will not determine the behaviour due to the negative external situation. The behaviour will only increase with attitude if there is a strong positive external surroundings (Guagnano et al., 1995). Socio demographic factors such as gender, age, political issues, parent's income and education level may affect the awareness, knowledge and attitude on environmental education (De Le Vega, 2006).

CHAPTER 3

METHODOLOGY

3.1 Research Location

The location of this research was conducted at the rural district of Ranau, Sabah (Figure 3.1). Ranau is located between 500 to 2, 000m above sea level on the Southern flank of the magnificent Mount Kinabalu that height up to 4, 101m which is known as the tallest mountain in Southeast Asia. Hence, it becomes the main tourist attraction not only in Ranau but, the whole Sabah.

However, one of the most active seismic activity in Malaysia is located in Ranau (Indan et al., 2018). Since Sabah is surrounded by the major world moving plates such as the Eurasian plates, Indian-Australians plates and Philippine-Caroline-Pacific plate, so, it triggered a few active faults around Sabah (Tongkul, 2015). The recent deadly 2015 earthquake is because of the Lobou-Lobou Fault moved on that area (Indan et al., 2018).

Ranau is surrounded by mountains and the geomorphology are like floodplain, river terraces, and plateau (Yusoff et al., 2016). Five villages were selected; Kampung Dumpiring Atas, Kampung Dumpiring Bawah, Kampung Kundasang Lama, Kampung Lembah Permai, and Kampung Mesilou. The village selection criteria was based on the analysis of information on the 2015 Ranau earthquake series (Khairul et al., 2016). The Department of Mineral and Geoscience Sabah (JMG) as well as from the media reports have also stated that, the five villages were the most affected during the 2015 earthquake disaster in Ranau (Khairul et al., 2016).

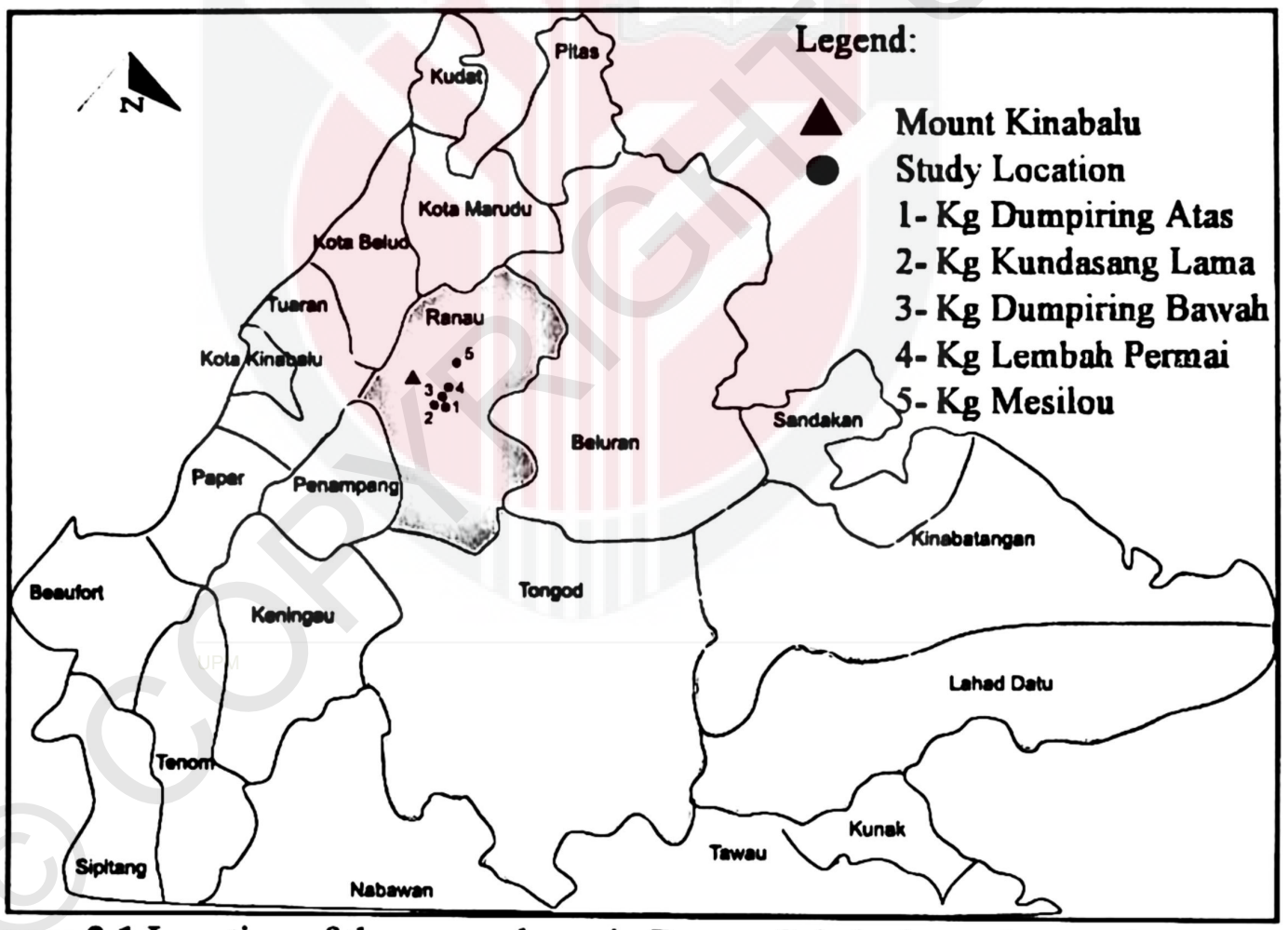

Figure 3.1 Location of the research are in Ranau, Sabah shown in grey boxes

3.2 Research Design

A cross-sectional study was conduct to determine the level of knowledge, attitude, and preparedness practice among community. This research involves the local community in Ranau, Sabah where they were believed to have experienced quite a few times of earthquake series in their life.

3.3 Sampling

3.3.1 Sampling Population

The respondents were from the community of Ranau, Sabah and analysed in terms of their knowledge, attitude and practice towards emergency preparedness of earthquake disaster. However, the respondents must fulfil the inclusive criteria in order to participate in this research.

3.3.2 Sampling Method

From 85 villages in Ranau, only 5 villages were selected based on stratified random sampling and from analysis of previous information and findings on earthquake in Ranau, Sabah. The 5 villages identified were the Kampung Dumpiring Atas, Kampung Dumpiring Bawah, Kampung Kundasang Lama, Kampung Lembah

Permai, and Kampung Mesilou. These villages were selected because these area were the most affected with the 2015 Ranau earthquake.

The total residents in each village were identified and obtained the number of representative respondents from each village by applying the stratified random sampling formula. The eligible respondents were required to complete a set of questionnaire that was distributed randomly via convenient sampling.

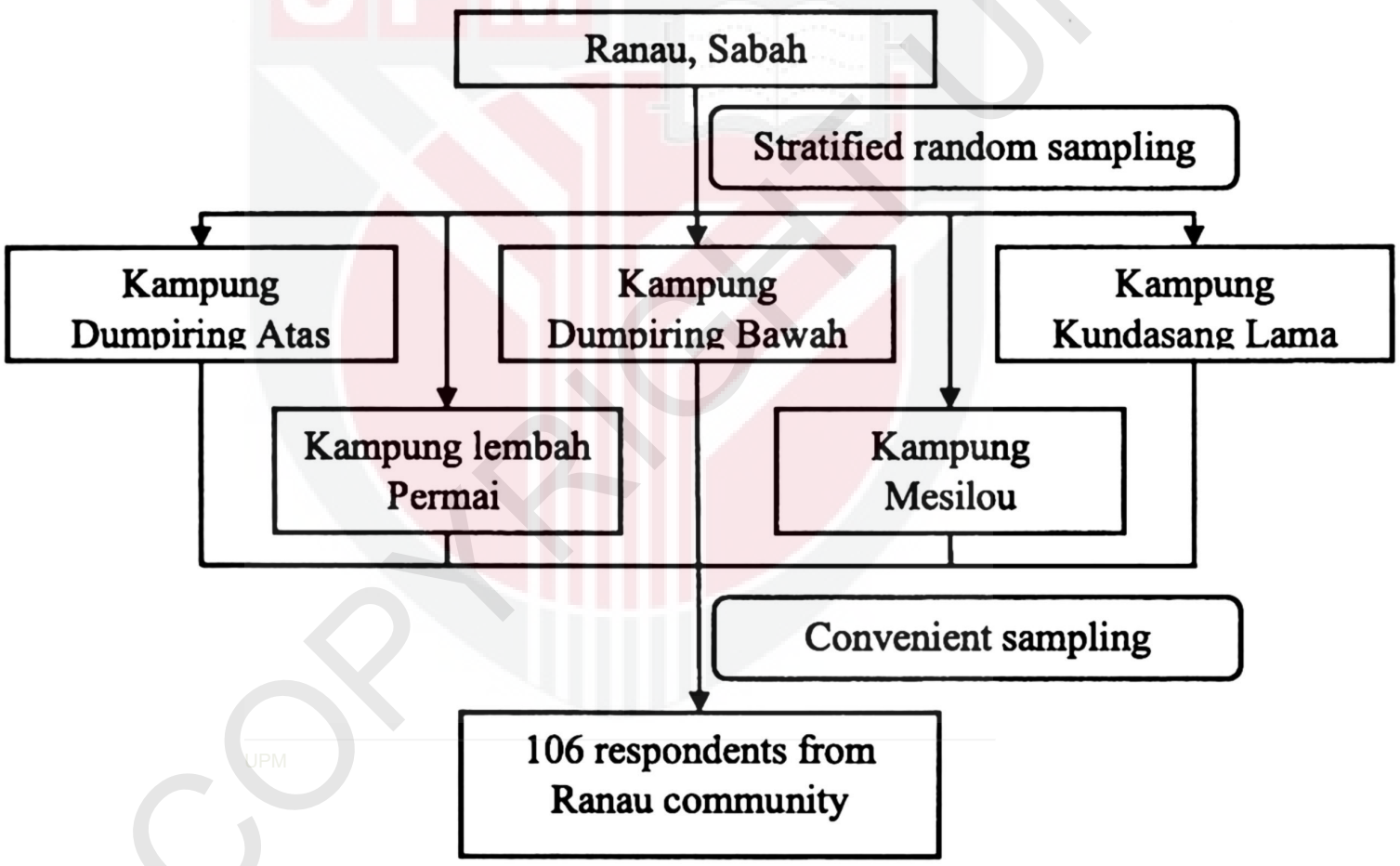

Figure 3.2 Sampling method summary

3.3.3 Sampling Unit

All residents of Ranau are capable to take part in this research if they fulfil the inclusive criteria;

1. Ranau residents age 15 years old and above. This is because according to Taghizadeh et al. (2012), individual age 15 and above will have the consciousness and understand about the related issue already.
2. Staying in Ranau for one year or more. This study is aiming for those who have undergone earthquake in their life. Moreover, the last earthquake event happened at Ranau was one year ago.

3.3.4 Sample Size

The sample size was calculated by using Slovin's (1960) formula of stratified random sampling (Khairul et al., 2016);

$$n = \frac{N}{1 + N(e)^2}$$

Where,

n = sample size

N = number of population

e = margin of error

1 = constant value

Based on the latest data from Ranau District Office (2018), the current population in the 5 selected villages are 2, 702 people.

$$n = \frac{2\,702}{1 + 2\,702\,(0.1)^2}$$

n = 96 Respondents

However, another 10% of the sample size was added in case if there is likelihood of refusal by respondents or being withdraw from the study due to non-fulfilment of the inclusive criteria or questionnaire was not completed upon its submission to the researcher.

$$10/100 \times 96 = 9.6 \quad , \approx 10 \text{ respondents}$$

Therefore, the overall sample size (96 + 10) is 106 respondents. Meanwhile, the distribution of the number of respondents from each village is determined as follow;

Table 3.1 Calculation of the number of respondent representative from each village

Village	Number of residents	% per village	Distribution (n = 106)
1. Kampung Dumpiring Atas	492	(492/2702)*100=18	(18/100)*106 = 19
2. Kampung Dumpiring Bawah	810	(810/2702)*100=30	(30/100)*106 = 32
3. Kampung Kundasang Lama	400	(400/2702)*100=15	(15/100)*106 = 16
4. Kampung Lembah Permai	700	(700/2702)*100=26	(26/100)*106 = 12
5. Kampung Mesilou	300	(300/2702)*100=11	(11/100)*106 = 12
Total	**2, 702**	**100%**	**Respondents = 106**

3.4 Research Instrumentation

3.4.1 Questionnaire

A set of questionnaire was produced from the adaptation from Taghizadeh et al., 2012 journal publication and Khairul et al., 2016 report publication. These two sources were the main references to come out with a modified set of questionnaire for data collection. The modified questionnaire was written in Bahasa Malaysia and divided into 5 sections which consist of respondents' socio-demographic (section A),

knowledge about earthquake disaster (section B), attitude towards earthquake (section C), practice on earthquake preparedness (section D) and the last section (section E) was an open ended question to obtain suggestion from the respondents in terms of earthquake preparedness measures. By providing an open-ended question, the respondent will have freedom and spontaneity when answering. Hence, it provide a variety of information and ideas from the respondents (Oppenheim, 1992). It may also give more time and space for sharing in terms of their understanding, experiences, opinions and interpretations of, their reaction to, social processes as well as the current situation (McGuirk and O'Neil, 2005)

Section A: respondent's socio-demographic data

In this section, the researcher wanted to gain the respondent's socio-demographic data such as their village name, age, race, sex, education level, duration of residency, marital status, occupation, monthly income, and the frequency of experiencing earthquake.

Section B: Knowledge on earthquake disaster

A total of 16 'yes/no' questions were asked to the respondents to evaluate their knowledge level on earthquake. Questions were related with the basic things and facts about earthquake.

Section C: Attitude towards earthquake disaster

Thirteen likert-scale (scale 1 (strongly disagree) – 5 (strongly agree)) types of questions were asked in this section to access the respondent's attitude towards earthquake disaster. "Earthquake can be avoided by praying and not doing any sinful act" was one of the questions included in this part.

Section D: Practice on the preparedness of earthquake

This section evaluating the respondents' practice in term of their preparedness by answering 13 'yes/no' type of questions. The example of question that was asked; "equipping themselves with earthquake insurance for property".

3.5 Data Collection

As soon as the ethics approval obtained, the Security Committee and Village Progress (JKKK) of each village was contacted to inform about the data collection process. On the day of the data collection, the respondents were given a short briefing concerning about the research. At the same time, a consent form was attached together with the questionnaire as a sign of agreement to participate in this study and a token of appreciation was given to those who have completed their questionnaire upon submission to the researcher.

3.6 Quality Assurance

3.6.1 Reliability Test

Pre-test was done to enable to run Cronbach's Alpha for internal consistency of the questionnaire. The number of respondents for Pre-test was 10% of the number of sample size (n=11). The sample of questionnaires were distributed to identify their ability and understanding in answering the questions. After that, a reliability test for Cronbach's Alpha values was calculated using the Statistical Package for Social Sciences (SPSS) software. In this study, the Cronbach's Alpha for the modified set of questionnaire is 0.73.

3.7 Data Analysis

Data analysed by using IBM Statistical Package for Social Science SPSS Statistic Version 25. The statistical analysis used were shown as follow;

Table 3.2 Statistical analysis for each objective

No	Objectives	Statistical analysis
1.	To determine the level of knowledge, attitude and practice among Ranau community on the preparedness of earthquake disaster.	Descriptive analysis
2.	To determine the distribution of socio-demographic factors among community in Ranau, Sabah.	Descriptive analysis
3.	To determine the association between knowledge and attitude toward earthquake disaster among community in Ranau, Sabah.	Spearman correlation
4.	To determine the association between knowledge and practice for preparedness of earthquake disaster among community in Ranau, Sabah.	Spearman correlation
5.	To determine the association between attitude and practice for the preparedness of earthquake disaster among community in Ranau, Sabah	Spearman correlation
6.	To determine the association between socio demographic factors (age, level of education and prior experience on earthquake) and the practice on earthquake preparedness.	Spearman correlation
7.	To determine the association between duration of residency	Spearman

	and knowledge on earthquake among the community.	correlation
8.	To obtain the suggestions on earthquake preparedness measures from the community.	Descriptive analysis

The scoring method for the questionnaire was determined based on Ajit & Chapman, 2010;

<u>Knowledge</u>

Right answer : 1 point

Wrong answer : 0 point

The results obtained was converted as the score level and classified into 3 levels; low, moderate, and high knowledge groups. The practicable score range between 0-16 points. The subject's group classification then determined based on the mean score and the standard deviation of the group.

Good level : score ≥ 14

Moderate level : score = 11 to 13

Low level : score ≤ 10

Attitude

Strongly agree answer : 5 points

Agree answer : 4 points

Moderate answer : 3 points

Disagree answer : 2 points

Strongly disagree answer : 1 point

The score obtained was be converted as the score level and classify at low attitude, medium attitude, and high attitude. The group classification was identified from the mean score and standard deviation of the group.

High attitude : score ≥ 52

Medium attitude : score = 41 to 51

Low attitude : score ≤ 40

Practice

Yes answer : 1 point

No answer : 0 point

The score obtained was converted as the score level and was classified into 3 groups (poor, medium and good practice). Feasible score can be at the range of 0-13 points. The classification was identified from the mean score and standard deviation of the group.

Good level : score ≥ 10

Medium : score = 6 to 9

Poor level : score ≤ 5

3.8 Ethical Consideration

This study was approved by the Ethical Committee Research Involving Human of University Putra Malaysia (JKEUPM) (Reff. no.: UPM/TNCPI/RMC/1.4.18.2 (JKEUPM) before the research started. Besides, this study was conducted on a voluntary basis where all respondents have their right to withdraw from participating after the briefing about the study being delivered to them. A written agreement consent form was also distributed to respect the right of the respondents and to ensure that all the data obtained is only use for the research purpose and will be keep as private and confidential.

CHAPTER 4

RESULT

4.1 To determine the distribution of socio-demographic factors

In this section, the frequency distribution of the 5 chosen variables represent the background characteristics of the 104 research participants. Table 4.1 shows the general detail of the respondents including the age, gender, education background, duration of residency and number of experiencing earthquake.

The first demographic characteristics is the age whereby it has been divided into 5 age groups. Most of the respondents were youth age 15-30 years old with a total of 46 (44.2%) respondents and only 5 (4.8%) senior citizen were sampled. Meanwhile, the respondents' gender comprise of 50 (48.1%) males and 54 (51.9%) females.

Next, the educational background was classified into 4 groups whereby 5 (4.8%) do not have formal education and 60 (57.7%) respondents completed their education up to secondary school.

Regarding the duration of residency, only 5 (4.8%) respondents stayed at Ranau for 6-10 years, however, 87 (83.7%) of them stayed in Ranau for 10 years and above and most of them have been living there since birth.

The last socio-demographic characteristic is the number of earthquake experience by the respondents. Six (5.8%) respondents have experienced earthquake once and 88 (84.6%) of them have felt the quake for 3 times or more.

Table 4.1 Socio demographic characteristics (n=104)

Demographic characteristics	Number (n)	Percentage (%)
Age (years old)		
15-30	46	44.2
31-40	26	25.0
41-50	13	12.5
51-60	14	13.5
≥ 60	5	4.8
Gender		
Male	50	48.1
Female	54	51.9
Education background		
No formal education	5	4.8
Primary school	14	13.5
Secondary school	60	57.7
Tertiary school	25	24.0
Duration of residency		
1-5 years	12	11.5
6-10 years	5	4.8
≥ 10 years	87	83.7
Earthquake experience		
1	6	5.8
2	10	9.6
≥ 3	88	84.6

4.2 General knowledge about earthquake disaster

This part to shows the frequency of public knowledge about the earthquake disaster and it is the supporting information on the overall knowledge level among the respondents. Table 4.2 is the data on the definition of earthquake, the authority

that should respondible for earthquake, the effect of earthquake, the factor that contribute to earthquake and also the needs of earthquake awareness program to be conducted.

Based on the question, majority of the respondents know what exactly an earthquake is. This has been indicated from the total number 95 (91.3%) who have answered the definition of earthquake correctly. There are 75 (72.1%) respondents know the authority responsible to act during the earthquake, however, 29 (27.9%) of them does not aware about this thing.

There are 80 (76.9%) aware that earthquake recorded the highest total of life loss if compared with other natural disasters and the remaining respondents answered incorrectly for this question. From this question, it shows that most of the respondents did not aware that dam construction can contribute to the occurrence of earthquake. Only 41 (39.4%) of the respondents answered correctly which is not even half of the total number of respondents and the rest of the respondents answered incorrect.

There is a high number of respondents 100 (96.2%) answered that through awareness program, it can encourage people to be more prepared for any risk of earthquake disaster in the future. Table 4.3 summarize the distribution of the level of knowledge about earthquake disaster. It is found out that the knowledge level among the respondents is moderate at 49 (47.1%).

Table 4.2 General knowledge about earthquake disaster (n=104)

Knowledge	Answers	Frequency (%)
1. Earthquake occur due to the sudden movement of soil/rock.	Correct	95 (91.3)
	Wrong	9 (8.7
2. Earthquake disaster is one of the responsibilities of the Malaysian National Security Council Directive No. 20.	Correct	75 (72.1)
	Wrong	29 (27.9)
3. Earthquake contribute the highest number of death toll and loss if compared with other natural disasters.	Correct	80 (76.9)
	Wrong	24 (23.1)
4. Huge scale of dam construction is also contributing to the occurrence of earthquake.	Correct	41 (39.4)
	Wrong	63 (60.6)
5. Awareness campaigns and programs on eathquake should be organised at early stage as a preparedness measure for any risk of earthquake in the future.	Correct	100 (96.2)
	Wrong	4 (3.8)

Table 4.3 Level of knowledge about the earthquake disaster

Knowledge (Score)	Frequency	Percentage (%)
High (≥14)	34	32.7
Moderate (11 to 13)	49	47.1
Low (≤10)	21	20.2

4.3 Attitude on earthquake disaster

This part is to shows the frequency of public attitude about the earthquake disaster among respondents. Table 4.4 is the data on the 5 selected questions out of 13 questions altogether in section C (attitude on the earthquake disaster). Based on the questions, most of the respondents 48 (46.2%) agree that earthquake incident is a fate and cannot be avoided. The same thing with the practice of keeping emergency numbers to contact in time of emergency with 55 (42.3%) respondents done that.

Majority of the respondents 48 (46.2%) strongly agree that the key to survive in earthquake is to be calm. However, 49 (47.1%) of the respondents have neutral respond whether if they know the disaster risk reduction done by the authority. The same goes to the attitude of the respondents 29 (27.9%) towards the 2015 earthquake incident that might happened due to the disrespectful act of the tourists on the Mount Kinabalu which might lead to the catastrophic disaster ever recorded in Malaysia.

Table 4.5 briefly figured the distribution of the level of attitude about earthquake disaster. It is found out that the attitude is at moderate level with 77 (74.0%).

Table 4.4 Attitude on earthquake disaster (n=104)

Attitude	Choice of answers	Frequency (%)
1. Earthquake is a fate and cannot be avoided.	Strongly disagree	4 (3.8)
	Diagree	3 (2.9)
	Moderate	8 (7.7)
	Agree	48 (46.2)
	Strongly agree	41 (39.4)
2. I know and keep emergency contact numbers like bomba, police, hospital to call for help in time of emergency.	Strongly disagree	7 (6.7)
	Diagree	12 (11.5)
	Moderate	14 (13.5)
	Agree	44 (42.3)
	Strongly agree	27 (26.0)
3. Be calm and not panic is the key to survive from earthquake.	Strongly disagree	4 (3.8)
	Diagree	3 (2.9)
	Moderate	6 (5.8)
	Agree	43 (41.3)
	Strongly agree	48 (46.2)
4. I know the importance of disaster risk reduction developed by the authority.	Strongly disagree	5 (4.8)
	Diagree	20 (19.2)
	Moderate	49 (47.1)
	Agree	23 (22.1)

		Strongly agree	7 (6.7)
5.	The 2015 earthquake in Ranau is believed to have correlation with the belief and tradition of the local communities, whereby the ancestor (Akinabalu) was not happy with the disrespectful act of the tourists.	Strongly disagree	16 (15.4)
		Diagree	15 (14.4)
		Moderate	29 (27.9)
		Agree	27 (26.0)
		Strongly agree	17 (16.3)

Table 4.5 Level of attitude on the earthquake disaster

Attitude (Score)	Frequency	Percentage (%)
High (≥52)	14	13.5
Moderate (41 to 51)	77	74.0
Poor (≤40)	13	12.5

4.4 Practice on the preparedness of earthquake

This part is to show the frequency of public practices on the preparedness of earthquake disaster among respondents. Table 4.6 is the data on the 5 selected questions out of 13 questions altogether in section D (practices on the preparedness of earthquake disaster).

Based on the questions, most of the respondents 77 (74.0%) keep safety and emergency tools at home and 81 (77.9%) respondents have identified the safe and unsafe areas at their home.

However, most of the respondents 62 (59.6%) do not cover themselves with earthquake insurance for life and property protection during earthquake and 74 (71.2%) claim that the community do not have any disaster early warning system nearby them.

From the preparedness practice among the respondents, it is found out that 73 (70.2%) of the respondents prefer and gain information about upcoming or high risk disaster occurence from social media compared to convensional media.

Table 4.7 shows the overall level of practice on the preparedness of earthquake disaster. The preparedness practice among the respondents are at moderate with 69 (66.3%).

Table 4.6 Practice on the preparedness of earthquake disaster (n=104)

	Practice	Choice of answers	Frequency (%)
1.	Safety and emergency tools such fire extinguisher, torch light, etc are always ready at home.	Yes	77 (74.0)
		No	27 (26.0)
2.	Identify safe and unsafe areas at home when eartqhuake strikes.	Yes	81 (77.9)
		No	23 (22.1)
3.	I have earthquake insurance for property and life protection	Yes	42 (40.4)
		No	62 (59.6)
4.	The local community owns a disaster early warning system.	Yes	30 (28.8)
		No	74 (71.2)
5.	Dissemination of information through social media such as SMS, Whatsapps, and Facebook is very effective compared to conventional media such as newspapers in conveying information about earthquakes.	Yes	73 (70.2)
		No	31 (29.8)

Table 4.7 Level of preparedness practice of the respondents towards earthquake disaster.

Practice (Score)	Frequency	Percentage (%)
High (≥10)	19	18.3
Moderate (6 to 9)	69	66.3
Poor (≤5)	16	15.4

4.5 To determine the association between knowledge, attitude and preparedness practice towards earthquake disaster (n=104)

The Spearman's correlation was used to determine the association between knowledge and attitude on earthquake disaster (Table 4.8), knowledge and preparedness practice on earthquake (Table 4.9), as well as attitude and preparedness practice on earthquake disaster (Table 4.10). Spearman's correlation were used because all the variables presented in continuous data and the data is not normally distributed.

Based on the Table 4.8, Table 4.9 and Table 4.10, there is no correlation found between respective variables since the p-values are more than 0.05 ($p = 0.098$, 0.114, and 0.160 respectively). Hence, the results are not significant. Meanwhile, the correlation between respective variables were also poor as all the r-values obtained <0.25 ($r = 0.163$, 0.156 and 0.139 respectively).

Table 4.8 Association between knowledge and attitude on earthquake

	Attitude	
	Correlation coefficient, r	**p-value**
Knowledge	0.163	0.098

Table 4.9 Association between knowledge and preparedness practice on earthquake

	Practice	
	Correlation coefficient, r	**p-value**
Knowledge	0.156	0.114

Table 4.10 Association between attitude and preparedness practice on earthquake

	Practice	
	Correlation coefficient, r	**p-value**
Attitude	0.139	0.160

4.6 To determine the association between socio demographic factors (age, level of education and prior experience on earthquake) and practice on earthquake preparedness.

As the data is not normally distributed, it is then proceed with a non parametric test of Spearman's correlation. It is found that a fair inverse correlation between age and practice on the preparedness of earthquake (r= -0.253) as shown in Table 4.11. Meanwhile, there is a strong association between age and preparedness practice on earthquake as the p-value is 0.010.

Next, the correlation between the level of education and practice on the preparedness of earthquake is poor as the r-value is <0.25 (r= -0.253). however, there is a strong association between the level of education and preparedness practice on earthquake as the p-value is 0.018.

Lastly, it is also found that a fair inverse correlation between earthquake experience and practice on the preparedness of earthquake (r= -0.273). Meanwhile, there is a very strong association between experience of earthquake and preparedness practice on earthquake as the p-value is 0.005.

Table 4.11 Association between age and preparedness practice on earthquake

	Practice	
	Correlation coefficient, r	**p-value**
Age	-0.253	0.010**
Level of education	0.232	0.018*
Experience of earthquake	-0.273	0.005**

**. Correlation is significant at the 0.01 level.

*. Correlation is significant at the 0.05 level.

4.7 To determine the association between Duration of Residency and Knowledge

As the data is not normally distributed, it was then proceed with a non parametric test of Spearman's correlation. Based on Table 4.12, it is found that a fair inverse correlation between duration of residency and knowledge about earthquake (r= -0.203). Meanwhile, there is a strong association between age and preparedness practice on earthquake as the p-value is 0.039.

Table 4.12 Association between duration of residency and knowledge

	knowledge	
	Correlation coefficient, r	**p-value**
Duration of residency	-0.203	0.039*

*. Correlation is significant at the 0.05 level.

4.8 Suggestions of preparedness measures from the community

Based on the graphs below, the suggestions given by the respondents summarized based on the 5 parties involved; Government, Non-Governmental Organization (NGO), Individual, Media, and the Supplier of the building materials. However, since the questionnaire is an open ended question, not all respondents have completed this section makin the total number of suggestion obtained is not 104.

In Figure 4.1, there are 31 respondents suggested that government should play an important role in formulating preparedness measures for the community whereby 35.5% suggestions both to ask the government have advance technology in earthquake detection system and effective disaster management and mitigation.

Figure 4.2 which is the suggestions suggested by 13 respondents to the Non-Governmental Organization (NGO). The respondents would like NGO to organise more public awareness program on earthquake and 30.8% of the respondents suggested NGO to set up disaster emergency and rescue team.

Meanwhile, in Figure 4.3 was the suggestions for the individual themselves. Thirty-six respondents think that preparedness starts from the individual himself/herself. A number of 33.3% respondents suggested that an individual should always be alert of the possibilities of earthquake especially for those who live at the earthquake-prone area.

Lastly, Figure 4.4 shows 10 (59%) respondents suggested that the supplier should have knowledge on the building material that is suitable to be use in an earthquake prone area and supply that building material to the residents. For the media's action 7 (41%) suggestions suggested by the respondents is none other than to deliver any up-to-date information about the upcoming or possibility of earthquake occurrence through media social.

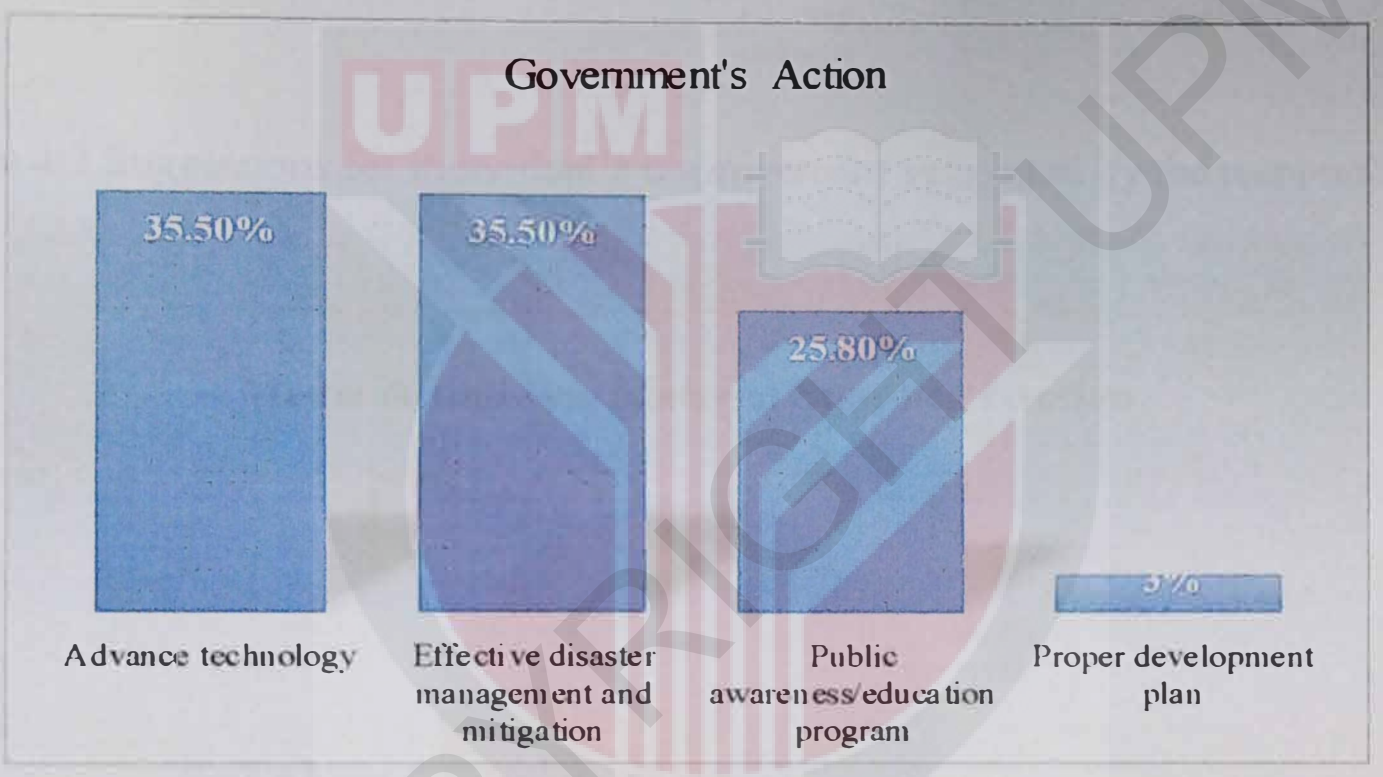

Figure 4.1 Suggestions for the government's improvement given by the respondents

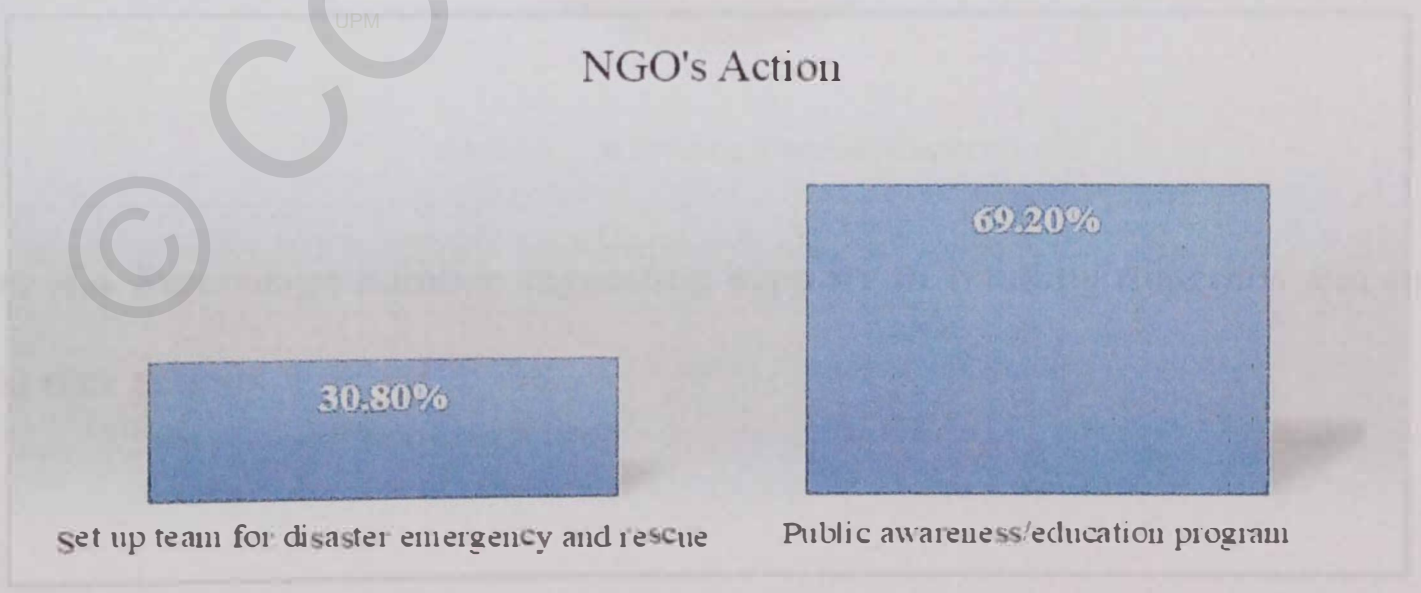

Figure 4.2 Suggestions for NGO's improvement given by the respondents

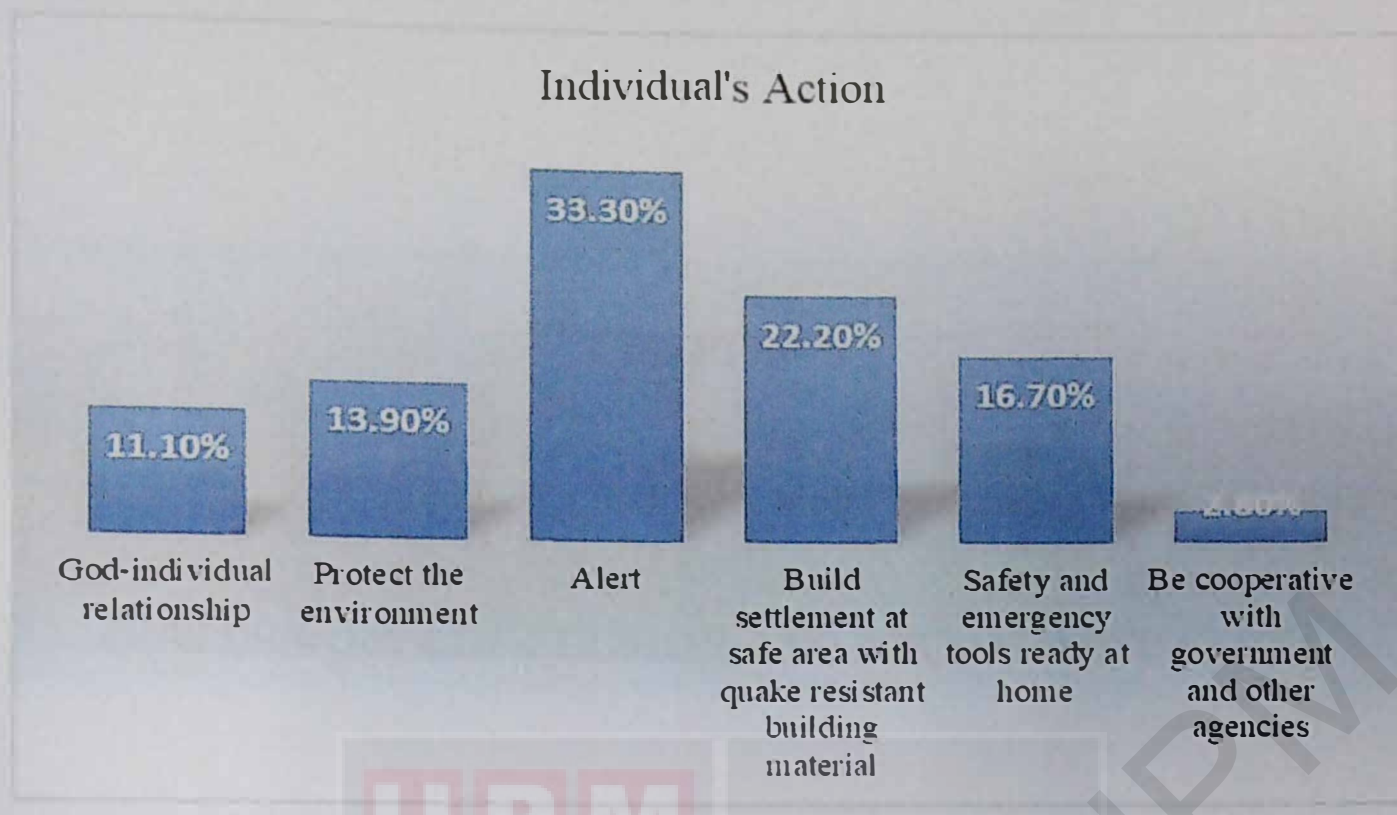

Figure 4.3 Suggestions for individual's improvement suggested by the respondents

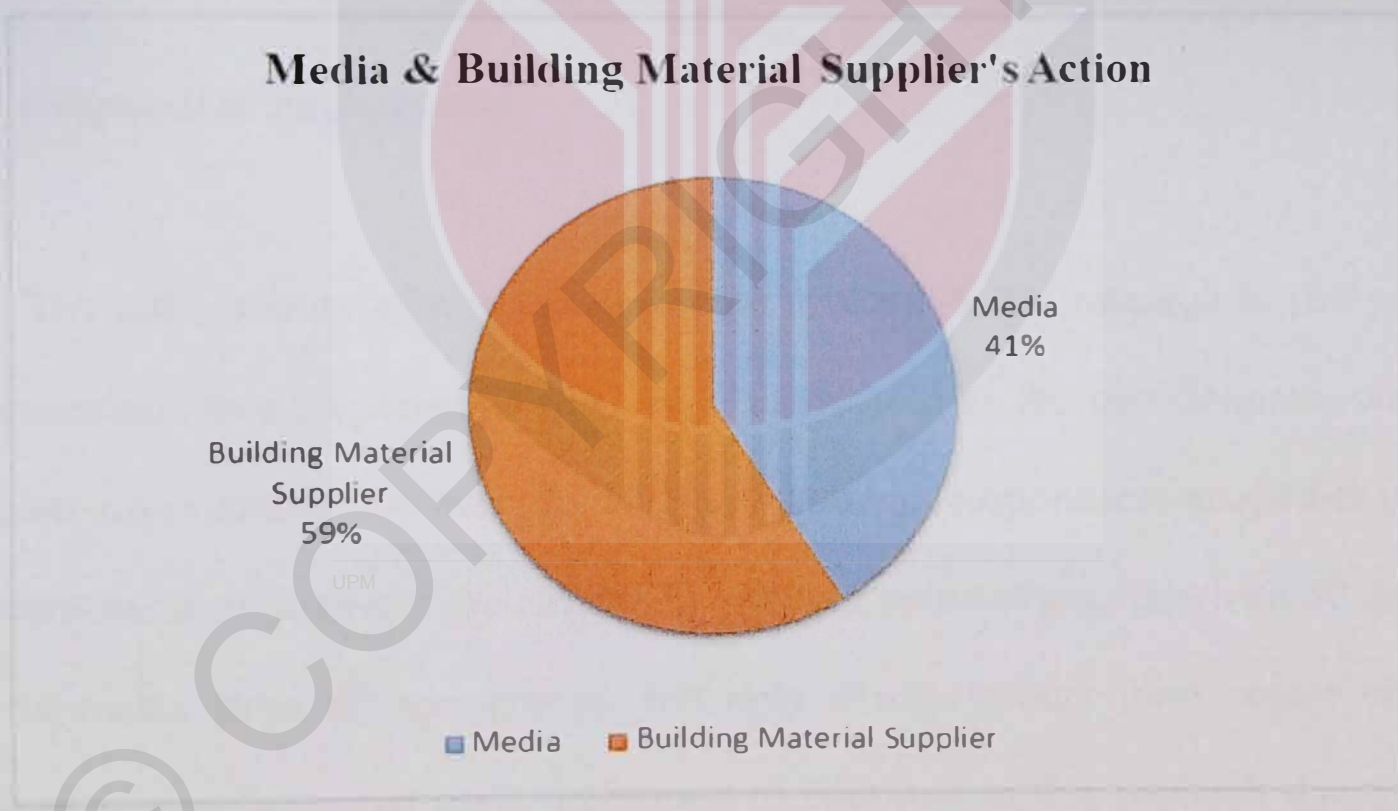

Figure 4.4 Percentage number suggesting supplier of building materials and media should take actions

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

5.1.1 Respondent background

The total amount of respondent should involve in this research is 106 people. Unfortunately, two respondents have been eliminated as the questionnaire was not complete upon submission making the total number of respondents altogether is 104. The number of respondents are almost the same in terms of gender where 50 females and 54 males from all age groups, but only 5 respondents from senior citizens obtained as they were not really interested to take part in this research due to their biological limitations of difficulty to read and understand on what the researchers were trying to explain provided with the questions consist in the questionnaire.

Based on the data, majority respondents live in Ranau for more than 10 years. From the observation and simple conversation with the respondents during the data

collection, it was found that those who lived more than 10 years are those who grew up at Ranau. Hence, almost the same number of respondents who have experienced earthquake for 3 times or more. Meanwhile, respondents who have been living in Ranau but below 10 years are those who get married with Ranau people and newly moved in to that area.

5.1.2 General knowledge about earthquake disaster

The knowledge level of the respondents as overall is at moderate. The people of Ranau might have the information about the disaster but they have less exposure on the specific detail about it. Knowledge is a crucial component on environmental awareness to understand more and identify the consequences of the public to the ecosystem (Gambro et a., 1996). This can be evaluated by referring to the way they answered the earthquake definition and which authority shall in charge if earthquake happen. Majority of the respondents answered correctly as well as they even aware that earthquake contributed the highest loss in terms of death toll and found that the necessity to organise and participate any earthquake awareness program can improve the preparedness practices of an individual on earthquake disaster.

Haliza & Rapeah (2018) defined earthquake as the sudden movement of the Earth's surface. Hence, the answer for the statement should be true where 91.3% of the respondents get it right. A number of 72.1% respondents answered correctly that the Malaysian National Security Council Directive No. 20 is responsible for

earthquake occurrence in this country (Malaysian National Security Council). Earthquake is the most horrifying disaster that can contribute to the highest human life loss (Baytiyeh, 2014) and most of the respondents also aware of this when 76.9% of them answered this question correctly. However, respondents seem to miss the fact that dam construction can also lead to the occurrence of earthquake since dam can alter the surface and the water pressure in the micro-cracks of the Earth (International Rivers, 2018).

5.1.3 Attitude on earthquake disaster

The level of attitude among the respondents is at moderate of 74%. Some knowledge about environment can further their strength on the attitudes and their practice on the environmental-friendly habit (Awang et al., 2013). Therefore, the level of knowledge in the previous part influence a little bit on the attitude of the respondents toward earthquake.

Moreover, series of earthquake strikes Ranau area for years but with low magnitudes. Since they have grown up with weak earthquake around them, they become immune with the quakes. This makes them believe that the phenomenon is normal for them, hence, it makes them convince that earthquake is a fate and nothing can be done to avoid earthquake. Besides, most of the respondents have an average tradition belief of the local community about the sacred Mount Kinabalu and its ancestors (Kadazan Homeland, 2018).

5.1.4 Practice on the preparedness of earthquake

Theoretically, a well-informed individual are more thoughtful on the disaster preparation (Adem, 2014). In Malaysia, since earthquake is a rare disaster, the awareness program, disaster warning system and subjects related with earthquake is still far from a deep implementation to the public (Adnan et al., 2015). Hence, the preparedness practice on earthquake based on the result is also at moderate level of 66.3%.

5.1.5 Association between knowledge, attitude and preparedness practice towards earthquake disaster

The attitude on earthquake is the main indicator to the preparedness practice towards earthquake disaster. But, attitude alone will not influence a good behaviour and preparedness practices when an individual is not equipped with knowledge about this issue (Adilah, 2017). Someone's effort cannot be pushed only with attitude, even though attitude is vital to determine good action (Oweini and Houri, 2006).

However, based on the results obtained among the Ranau community, there are poor association between knowledge and attitude, knowledge and preparedness practice, as well as attitude and preparedness practice. This is determined by the p-values obtained where all the values were >0.05 which shows no significant among the variables. In order to determine the preparedness practice among local

communities, it must come from the basic awareness about the earthquake disaster from education programs, campaign, trainings or other resources to increase their knowledge level regarding the issue concerned (Adem, 2014). The knowledge were the effect of the public's self-learning, surrounding awareness, managing behaviour and decision making (Lorenz et al., 2015).

5.1.6 Association between socio demographic factors (age, level of education and prior experience on earthquake) and practice on earthquake preparedness.

The socio demographic of age have shown a significant relationship with the preparedness practice on earthquake disaster. However the correlation (r value) is a fair inverse correlation (r= -0.253). Which means that as the age increases, the preparedness practice on earthquake is low. Based on previous study on KAP (Khan, Ahmed, Khalid, Siddiqui, & Merchant, 2010), it was mentioned that people at young age possess a better knowledge in all aspects as they have attended schools. Hence, they have a better exposure on disaster preparedness compared to the elderly. This is even strengthen by the evidence of r= -0.436 and a very strong association of p= 0.001 between age and education level.

Other studies mentioned that older people do not really care about the preparedness of earthquake since they already experienced it for more than decades, but, they claimed that no damages happened onto them. Hence, they do not think that preparedness for earthquake is important for their survival (Livingston, McCarty, &

Taylor, 1998). However, Gerdan (2014) claimed that the elderly should have a higher sensitivity and more responsible to the problem because they have experienced many times.

Meanwhile, the association between the level of education and the preparedness practice is strong at p-value= 0.018. This means that, when the level of education is higher, the preparedness practice on earthquake is better. Previous studies have mentioned that individual with higher education level would have a good understanding on the related issue (Livingston et al., 1998) for example, the earthquake. When the individual is knowledgeable, they will have a better awareness on preparedness measures for the upcoming yet unpredictable disaster around them.

However, based on the findings, only 32.7% of the respondents have an adequate knowledge about some of the basic information on earthquake. Level of education is crucial in reducing the total loss bared when a disaster like earthquake happens (Gerdan, 2014). A study on the 1999 Kocaeli earthquake in Turkey also have discussed that some of the disaster preparedness training might not include in formal education system which make no guarantee that even there is a high number of people went to school but if they did not equipped with the required knowledge on disaster management itself, then it will not bring any benefits to the stakeholders (Gerdan, 2014).

Next, the association between earthquake previous experience and preparedness practice for the disaster shows a very strong correlation as the p-value

is <0.05 (p= 0.005). There is also a previous study that can support this finding which is from Adeola (2009) that have mentioned previous experience on earthquake can help to determine an individual's preparedness measure for instance, on the emergency evacuation plan.

The more a person experience and witnessed an earthquake, the higher the awareness on the need of preparedness measures before anything bad happen during the earthquake. Take an example, when an individual have gone through a tremendous experience of earthquake, he or she will find out the root cause and all the related information of the disaster and will start to plan as well as to prepare to protect life and property so that the burden due to loss from the disaster can be reduced.

5.1.7 Association between duration of residency and knowledge on earthquake

There is a strong association (p= 0.039) between duration of residency and knowledge about earthquake obtained from the finding of this research. Based on previous study have mentioned that the longer the duration of stay in that particular area, the lesser the probability of knowledge on the earthquake including the voluntary evacuation. The fact that the individual has successfully survived in the previous quakes and witnessed the false alarm in the past makes them convinced that nothing bad will happen to them yet we never know (Adeola, 2009).

However, based on the research finding, it was found out that there is a negative poor correlation coefficient of r-value (r= -0.203) between these 2 variables. Since it is a negative outcome, it means residents who lived longer in Ranau area possess a lower level of knowledge compared to those who have just moved in. The difference in lifestyle or family background and influence can be the factors for the individual to gain knowledge provided with their length of stay in Ranau (Zarrintaj et al., 2013).

5.2 Conclusion

This research was done to determine the level of knowledge, attitude and practice about the earthquake preparedness in Ranau, Sabah. The findings have discussed the level of knowledge, attitude and practice (KAP) on the preparedness of earthquake disaster among community in Ranau, Sabah where it have indicated an overall finding of moderate level of each variable. However, there were no significant associations between the variables (KAP). Therefore, there is a need to improve the awareness level on earthquake among the community in order to have a better outcome in terms higher knowledge and attitude on earthquake as well as more preparedness measures to be taken to any possibilities of earthquake series in the future.

This research have also clarify few socio demographics factors that can be helpful and ease the process of approaching the community to increase their awareness on earthquake incidents. By focussing on certain socio demographic factors, to achieve a specific aim in disaster management and mitigation towards risk communication among community, a better overview is figured out in this research. Socio demographics such as age, education level, duration of residency, and earthquake prior experience can be the tools to get engage and approach with the community as these factors were believed to have association with the KAP. Public by now should realised of the episodes of earthquake in Malaysia and it is no longer an unusual destructive events happening especially in Ranau. Hence, all parties should take part and play their roles or else, they should prepare for a bigger consequences of loss in their life by the destructive earthquake.

5.2.1 Research Limitation

There are few limitations encountered by the researcher upon the completion of this study. The first one is the research instrument used may be a source of bias as the questionnaire was adopted from few sources even though pre-test was being conducted right before the data collection. Next, although local communities from other district have also experienced the episodes of earthquake, and they might have extra advice to share, but due to limited resources, the survey was only been done in Ranau district of Sabah. This questionnaire consist of an open-ended question, but most of the respondents just leave that question blank without any answer, hence

make it difficult to access their suggestions on other preparedness measures to be taken for earthquake. Lastly, only 104 questionnaires were managed to be collected as two of the questionnaires were not answered completely upon the submission of the questionnaire to the research team.

5.3 Recommendation

The research have done a great finding and is useful to provide a basic overview in formulating a better awareness on earthquake among the local community. However, in order to make the generalization of the findings, a similar study can be conducted with a larger and wider population in Sabah because most of the district in Sabah are vulnerable for earthquake. Next, it is much more emphasized to conduct an interventional studies in different community setting to increase their awareness and the institutions should start and develop disaster preparedness training programs. The programs covered for instance, the basic disaster awareness, awareness on structural and non-structural earthquake hazards mitigation for those disaster prone area as it is very important to consider the major disasters on their land in their study curriculum.

Findings support the world's science-based developments and encourage education and training in disaster awareness in formal education is very needed for the time being. Lastly, it is very important to consider the preparedness measures suggested by the respondents during the survey that was divided into 5 parties to

cooperate in saving my life and reduce the total amount of loss due to such disaster.

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APPENDICES

ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS (JKEUPM)
UNIVERSITI PUTRA MALAYSIA

Research title	:	**Community Knowledge, Attitude and Practice on Preparedness of Earthquake Disaster in Ranau, Sabah**
Study Site	:	**Ranau, Sabah**
JKEUPM Ref No.	:	**JKEUPM-2018-382**
Researcher	:	**Joanita Jonis**
Supervisor	:	**Assoc Prof. Dr. Haliza Abdul Rahman**

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 29/10/2018
2. Respondent Information Sheet & Consent (Malay), Version 2 dated 28/11/2018
3. Proposal (English), Version 2 dated 26/12/2018
4. Questionnaires/ Interviews (Malay), Version 1 dated 29/10/2018
5. Curriculum Vitae of:
    a. Assoc Prof. Dr. Haliza Abdul Rahman

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.

Decision by JKEUPM:

[X] Approved

[X] **Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**

[ ] Disapproved

Please note that the approval is **VALID UNTIL 2 JANUARY 2020**

Researchers should comply with the following:

I. Complete a Study Final Report upon study completion (Form 3.2).

II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

III. Applicable for Clinical Trial Studies and Clinical interventional Studies only: Progress Report has to be submitted to JKEUPM at every 6 months from the date of approval (Form 3.1). Report occurrences of all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs) and Protocol Deviation/ Violation at all JKEUPM approved sites to JKEUPM.

LAMPIRAN A

BIL	NAMA KAMPUNG	MANTAN PENGERUSI JKKK
1	KAMPUNG DUMPIRIG ATAS	SPAIREN JUMIN 019-531 2792
2	KAMPUNG DUMPIRING BAWAH	GAUSEH JALIMIN 013-896 1599
3	KAMPUNG KUNDASANG LAMA	AZIZ @ ABDUL AZIA RIJIN 013-558 7625
4	KAMPUNG MESILAU	JAPUDIN BIN GANDIPAL 012-8354676
5	KAMPUNG LEMBAH PERMAI	GUAHIL GUMAT 014-861 1117

Tarikh : [ ]

No. ID : [ ]

UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

BORANG KAJI SELIDIK

TAJUK KAJIAN:

PENGETAHUAN, SIKAP DAN PRAKTIS KOMUNITI TERHADAP PERSEDIAAN MENGHADAPI BENCANA GEMPA BUMI DI RANAU, SABAH

(Community Knowledge, Attitude and Practice on Preparedness of Earthquake Disaster in Ranau, Sabah)

NAMA PENGKAJI:

JOANITA JONIS (184317)

Tujuan borang soal selidik ini adalah untuk mendapatkan maklumat daripada anda selaku komuniti berkenaan dengan tahap pengetahuan, sikap dan praktis dalam persediaan menghadapi bencana gempa bumi di Ranau, Sabah. Semua jawapan anda akan diproses menggunakan komputer dan dikendalikan secara rahsia. Tiada hasil individu akan dibentangkan dalam apa jua jenis pembentangan.

Oleh itu, saya memohon jasa baik pihak tuan untuk menjawab soalan-soalan yang terdapat dalam borang soal selidik ini dengan jujur dan tepat.

Segala maklumat kajian yang diterima akan disimpan secara rahsia. Kerjasama dari pihak tuan amatlah dihargai.

Saya telah membaca pengenalan borang soal selidik dan bersetuju untuk menjawab mengikut syarat-syarat yang telah ditetapkan	Ya / Tidak

Tandatangan : .....

Tarikh : .....

SULIT

9. PERSETUJUAN

Saya..... No Kad Pengenalan. .....
beralamat.....
.....dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan yang tersebut di atas *(kajian klinikal/percubaan ubat-ubatan/rakaman video/kumpulan sasaran/temuduga/ soal selidik).

Saya telah diberi penjelasan secara menyeluruh mengenai penyelidikan ini dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaian Penerangan Responden). Saya memahami bahawa saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan.Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang melibatkan saya.

Saya setuju/tidak bersetuju untuk imej/gambar/rakaman video/ rakaman suara digunakan dalam apa jua bentuk penerbitan atau pembentangan. (sekiranya berkaitan).

***potong yang tidak berkenaan**

Tandatangan .....
(*Responden*)

Tarikh :.....

Tandatangan .....
(*Saksi*)

Nama :.....

No. K/P: .....

Saya mengesahkan bahawa saya telah menerangkan kepada responden ini sifat dan tujuan penyelidikan yang tersebut di atas.

Tarikh .....

Tandatangan .....
(*Penyelidik*)

BAHAGIAN A: SOSIO DEMOGRAFIK RESPONDEN

Tandakan (√) pada ruangan yang telah disediakan dan isi tempat kosong.

1. Nama kampung : .....

   ☐ Dilahirkan dan dibesarkan di sini

   ☐ Berpindah dari kampung lain

2. Umur : ..... tahun

3. Bangsa : .....

4. Jantina :
   ☐ Lelaki
   ☐ Perempuan

5. Tahap pendidikan :
   ☐ Tidak pernah bersekolah
   ☐ Sekolah rendah
   ☐ Sekolah menengah
   ☐ Pendidikan tinggi (Nyatakan: .....)
   ☐ Lain-lain (Nyatakan: .....)

6. Berapa lama anda telah menetap di kawasan ini :
   ☐ Kurang daripada 1 tahun
   ☐ 1-5 tahun
   ☐ 6-10 tahun
   ☐ 11 tahun dan ke atas

7. Status perkahwinan :
   ☐ Bujang
   ☐ Sudah berkahwin
   ☐ Janda/duda/balu

8. Pekerjaan :
   ☐ Sektor kerajaan
   ☐ Sektor swasta / bekerja sendiri
   ☐ Tidak bekerja / berpencen
   ☐ Pelajar

9. Pendapatan bulanan :

- ☐ RM1000 dan ke bawah
- ☐ RM1001 – RM2000
- ☐ RM2001 – RM3000
- ☐ RM3001 – RM4000
- ☐ RM4001 – RM5000
- ☐ RM5001 dan ke atas

10. Berapa kali anda pernah mengalami bencana gempa bumi :

- ☐ Sekali
- ☐ Dua kali
- ☐ Tiga dan ke atas

BAHAGIAN B: PENGETAHUAN MENGENAI BENCANA GEMPA BUMI

Tandakan (√) pada ruangan yang telah disediakan.

No	Soalan	Betul	Salah
1.	Bencana gempa bumi merupakan salah satu bencana alam semula jadi.		
2.	Gempa bumi adalah disebabkan oleh pergerakan tanah/batu yang berlaku secara tiba-tiba.		
3.	Bencana gempa bumi boleh diramal/diagak.		
4.	Gempa bumi berskala 9 tidak mendatangkan kesan/impak yang teruk kepada penduduk sekeliling.		
5.	Bencana gempa bumi hanya berlaku di kawasan darat sahaja.		
6.	Bencana gempa bumi boleh mencetuskan bencana alam yang lain seperti tsunami dan tanah runtuh.		
7.	Sistem Amaran Awal Tsunami Nasional Malaysia (SAATNM) turut mengeluarkan maklumat mengenai bencana gempa bumi.		
8.	Bencana gempa bumi merupakan salah satu tanggungjawab Majlis Keselamatan Negara dibawah Arahan No. 20.		

9.	Malaysia terletak di luar lingkaran api pasifik, maka, negara sepatutnya bebas daripada sebarang risiko bencana gempa bumi.		
10.	Kajian ketahanan bangunan / infrastruktur terhadap bencana gempa bumi giat dijalankan dari semasa ke semasa.		
11.	Bencana gempa bumi tidak mendatangkan kesan yang teruk kepada keselamatan manusia.		
12.	Bencana gempa bumi merupakan penyumbang jumlah kematian dan kerugian yang tertinggi jika dibandingkan dengan bencana alam sekitar yang lain.		
13.	Bencana gempa bumi juga boleh disebabkan oleh aktiviti manusia seperti pembinaan empangan berskala besar.		
14.	Kempen-kempen dan program-program kesedaran mengenai bencana gempa bumi perlu dimulakan awal sebagai langkah persediaan menghadapi sebarang kemungkinan berlakunya bencana gempa bumi di masa akan datang.		
15.	Pendidikan formal dan tidak formal berkaitan bencana merupakan instrumen utama dalam memperkaya pengetahuan masyarakat tentang gempa bumi.		
16.	Bencana gempa bumi paling teruk pernah berlaku di Sabah adalah pada 5 June 2015 berskala 5.9 ricter.		

BAHAGIAN C: SIKAP TERHADAP BENCANA GEMPA BUMI

Tandakan (√) pada ruangan yang telah disediakan.

No	Huraian	Sangat tidak setuju (1)	Tidak setuju (2)	Sederhana (3)	Setuju (4)	Sangat setuju (5)
1.	Bencana gempa bumi boleh dielakkan dengan berdoa kepada Tuhan dan tidak berbuat dosa.					
2.	Bencana gempa bumi merupakan satu takdir dan tidak dapat dielakkan.					
3.	Kerajaan telah menyediakan kemudahan mencukupi bagi menghadapi bencana gempa bumi.					
4.	Kerajaan akan membaik pulih semula kawasan saya selepas bencana gempa bumi.					
5.	Saya tahu dan ada menyimpan nombor-nombor agensi mana perlu dihubungi seperti bomba, polis, dan hospital untuk mendapatkan bantuan ketika bencana gempa bumi.					
6.	Bersikap tenang dan tidak panik adalah kunci utama dalam menghadapi bencana gempa bumi.					
7.	Rumah saya dibina kukuh dan mampu bertahan sekiranya berlaku gempa bumi.					
8.	Saya mengetahui kepentingan aktiviti pengurangan risiko bencana seperti bencana gempa bumi yang dirangka oleh pihak pentadbir.					

9.	Adalah perlu untuk berkongsi pengalaman berhadapan dengan bencana khususnya bencana gempa bumi.					
10.	Persediaan dan perancangan awal dapat mengurangkan risiko kos kerugian dari segi kehilangan nyawa dan kerosakan harta benda.					
11.	Ranau berpotensi mengalami bencana gempa bumi pada skala kecil dan sederhana.					
12.	Fenomena gempa bumi di Sabah berada pada tahap yang membimbangkan pada masa kini.					
13.	Bencana gempa bumi yang telah berlaku di Ranau, Sabah berhubung kait dengan kepercayaan, adat dan tradisi nenek moyang (Pelindung Gunung) masyarakat tempatan yang tidak senang dengan tindakan pelancong Eropah yang tidak menghormati Akinabalu.					

BAHAGIAN D: LANGKAH KESELAMATAN (PRAKTIS) YANG DIAMBIL BAGI MENGHADAPI BENCANA GEMPA BUMI

Adakah anda mengambil tindakan berikut sebagai langkah berjaga-jaga menghadapi bencana gempa bumi? Tandakan (√) pada ruangan yang telah disediakan.

No	Soalan	Ya	Tidak
1.	Komuniti yang tinggal di kawasan berisiko gempa bumi perlu mengambil langkah persediaan awal.		
2.	Membina bangunan/rumah daripada material/bahan yang mampan daripada bencana gempa bumi. (Jika YA, nyatakan jenis material yang digunakan: .....)		
3.	Menyediakan alat-alat keselamatan seperti alat pemadam api, peti pertolongan cemas, radio, lampu suluh, ubat-ubatan di rumah sebagai persediaan pada waktu kecemasan. (Jika YA, nyatakan alat-alat keselamatan yang disimpan: .....)		
4.	Menyediakan simpanan bekalan air dan makanan yang mencukupi.		
5.	Menentukan kawasan selamat dan tidak selamat di rumah sekiranya berlaku gempa bumi.		
6.	Menghadiri latihan/aktiviti pendedahan mengenai kesedaran bencana. (Jika YA, nyatakan nama latihan yang telah diikuti: .....)		
7.	Mempunyai insuran gempa bumi untuk harta benda.		
8.	Anda/komuniti memiliki suatu sistem amaran awal bencana. (Jika YA, siapakah yang mencadangkan sistem tersebut dan bagaimana ianya berfungsi (ringkas): ....)		

9.	Pemantauan dilakukan ke atas kawasan-kawasan berisiko bencana gempa bumi. (Jika YA, siapakah yang melakukan pemantauan tersebut? ☐ Dibuat sendiri oleh komuniti ☐ Dibuat sepenuhnya agensi kerajaan ☐ Secara kerjasama komuniti & agensi		
10.	Anda/komuniti memiliki pelan/peta yang menunjukkan kawasan-kawasan berisiko berlakunya bencana.		
11.	Anda/komuniti ada mewujudkan jawatankuasa khas bagi menguruskan aspek bencana.		
12.	Anda rela berpindah tempat tinggal sekiranya risiko gempa bumi masih wujud. (Sekiranya TIDAK, apakah strategi yang anda ambil demi melindungi keluarga dan harta benda? ☐ Sediakan sistem amaran bencana ☐ Kenalpasti dan sediakan pelan/peta kawasan risiko ☐ Mengubah amalan pertanian (mesra alam) ☐ Tidak menebang hutan / pokok ☐ Membaikpulih saliran dan struktur tanah ☐ Gunakan teknologi terkini (binaan tahan gempa, etc) ☐ Sediakan bekalan (air, makanan, ubatan) ☐ Tiada tindakan ☐ Lain-lain. Nyatakan; ……..		
13.	Penyampaian maklumat yang sahih melalui media sosial seperti SMS, *Whatsapps*, dan *Facebook* sangat berkesan berbanding media konvensional seperti televisyen, surat khabar dan radio dalam menyampaikan maklumat tentang bencana gempa bumi.		

BAHAGIAN E: CADANGAN MENGHADAPI BENCANA GEMPA BUMI PADA MASA HADAPAN

1. **Apakah cadangan / langkah penambahbaikan anda dalam menghadapi bencana gempa bumi pada masa hadapan?**

.....

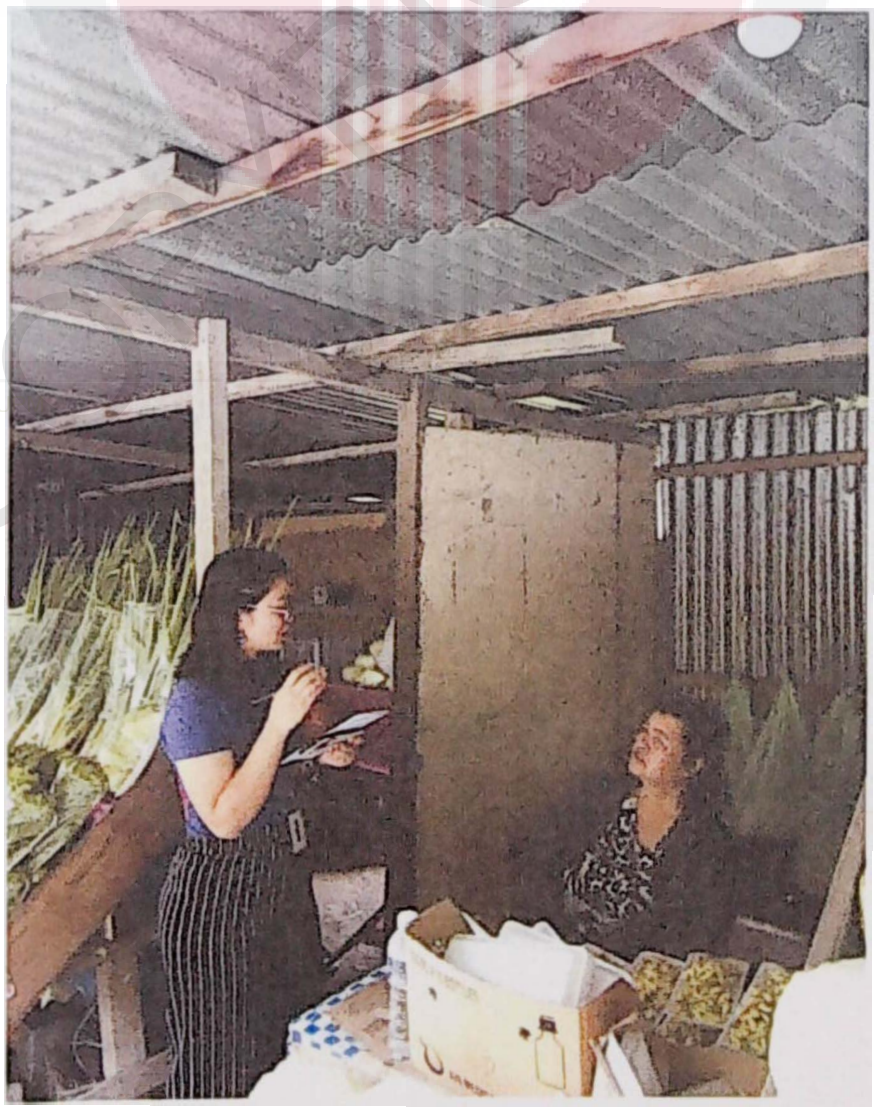
.....

.....

*****SEKIAN TERIMA KASIH*****

IMAGE OF RESEARCH

Re pondents were completing the questionnaire given



Re earcher wa approaching one of the community of Ranau to fill in the que tionnaire