A BUSINESS CONTINUITY MANAGEMENT (BCM) FRAMEWORK FOR DISASTER RESILIENT SMES IN MALAYSIA

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PUBLICATIONS AND PRESENTATIONS ARISING FROM THE THESIS

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ABSTRACT

Small and medium sized enterprises (SMEs) play an important role in the economy of most countries, crucial in terms of social inclusion, local employment and innovation. In the developed world, such as the European Union, around 99 percent of economic activities can be traced back to SMEs, accounting for almost 66 percent of all jobs in the private sector. A similar scenario can be seen in the developing world where SMEs accounted for over 90 percent of all enterprises and over 50 percent of the Gross Domestic Product (GDP).

The impact of disasters on SMEs is very high throughout the world, including both developed and developing countries. Lack of disaster resilience due to financial and expertise limitations means the impact of natural disasters to SMEs in developing countries are worst compared to developed countries in terms of casualty and economic losses. To deal with the negative impacts of natural hazards, many SMEs in developed countries such as United Kingdom, Japan and New Zealand are using Business Continuity Management (BCM) as their disaster risk reduction (DRR) approach. However, in developing countries including Malaysia, BCM is used by large and multinational companies to deal with IT issues and crisis management, rather than to help them better prepare for dealing with the threat posed by natural hazards.

Therefore, the purpose of the study is to develop a BCM framework that can be used to improve the resilience of Malaysian SMEs. To develop the framework, seven interviews with academic experts, industry players and government agencies were conducted and a survey among 127 SMEs' owners was conducted in order to examine the impacts of natural hazard to them and their understanding of BCM. Finally, once again expert interviews were conducted to validate the framework.

The results of this study show that the impacts of natural hazards are severe for SMEs in Malaysia and BCM can be used as an approach to reduce the impacts of natural hazards and to achieve disaster resilience but it must be affordable and understandable by the SMEs in Malaysia. In addition, the roles of stakeholders such as the government, private companies and NGOs are also significant for SMEs' disaster resilience.

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ABBREVIATIONS

ABIM	-	*Angkatan Belia Islam Malaysia*
ADB	-	Asian Development Bank
ADRC	-	Asian Disaster Reduction Center
APEC	-	Asia-Pacific Economic Co-operation
ASEAN	-	Association of Southeast Asian Nations
BCI	-	Business Continuity Institute
BCM	-	Business Continuity Management
BCMS	-	Business Continuity Management System
BIA	-	Business Impact Analysis
CARE	-	Cooperative for Assistance and Relief Everywhere
CDD	-	Civil Defense Department
CEOs	-	Chief Executive Officers
CSR	-	Corporate Social Responsibility
DID	-	Malaysian Drainage and Irrigation Department
DMRC	-	Disaster Management and Relief Committee
DRR	-	Disaster Risk Reduction
EC	-	European Commission
EM	-	Expectation Maximization
EM-DAT	-	Emergency Event Database
ERM	-	Enterprise Risk Management
FEMA	-	Federal Emergency Management Agency
GBBNGO	-	*Gabungan Bantuan Banjir NGO*
GDP	-	Gross Domestic Product

HADR	-	Humanitarian Assistance and Disaster Relief
HFA	-	Hyogo Framework for Action
IASC	-	Inter Agency Standing Committee
ICRC	-	International Committee of the Red Cross
IDNDR	-	International Decade for Natural Disaster Reduction
IFC	-	International Finance Corporation
IFRC	-	International Federation of Red Cross and Red Crescent Societies
IMF	-	International Monetary Fund
ISDR	-	International Strategy for Disaster Reduction
ISO	-	International Standard Organization
IT	-	Information Technology
LUPAR	-	Land Use Planning Appraisal for Risk
MACRES	-	Malaysian Centre of Remote Sensing
MARIM	-	Malaysian Association of Risk and Insurance Management
MERCY	-	Medical Relief Society Malaysia
MICG	-	Malaysian Institute of Corporate Governance
MIGA	-	Multilateral Investment Guarantee Agency
MITI	-	Ministry of International Trade and Industry
MKN	-	*Majlis Keselamatan Negara*
MNSC	-	Malaysian National Security Council
MRCS	-	Malaysian Red Crescent Society
MTD-RC	-	Mountainous Terrain Development Research Centre
NADDI	-	National Disaster and Information Management
NADMA	-	National Disaster Management Agency
NASEC	-	National Soil Erosion Research Centre

NGOs	-	Non-government Organisations
NOC	-	National Operation Council
NSC	-	National Security Council
NSD	-	National Security Division
OECD	-	Organization for Economic Cooperation and Development
PPP	-	public-private-partnership
R&D	-	Research and Development
RCS	-	Red Crescent Society
RO	-	Research Objective
SEADPRI	-	Southeast Asia Disaster Prevention Research Institute
SMART	-	Storm Water Management and Road Tunnel
SME	-	Small and Medium Size Enterprise
SMECorp	-	Malaysia SME Corporation Berhad
SMEs	-	Small and Medium Size Enterprises
UK	-	United Kingdom
UKM	-	Universiti Kebangsaan Malaysia
UPM	-	Universiti Putra Malaysia
UNDP	-	United Nations Development Program
UNECA	-	United Nations Economic Commission for Africa
UNIDO	-	United Nations Industrial Development Organization
UNISDR	-	United Nations International Strategy on Risk Reduction
USA	-	United State of America
USAID	-	US Agency for International Development

GLOSSARY OF TERMS

BCM	management process of identifying the ability of an organisation to continue delivery of products or services at acceptable predefined levels following a disruptive incident.
Business resilience	ability of businesses to respond flexibly to a changing environment, overcome unexpected shocks and remain competitive.
Coping capacity	the ability of people, organisations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters.
Coping strategy	actions that increase the ability to prevent, tolerate and/or recover from the impacts of natural hazards.
Disaster management	a body of policy and administrative decisions and operational activities which refers to the various stages of a disaster at all levels which is based on the key management principles of planning, organising, leading, coordinating and controlling.
Disaster	a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources.
Natural hazard	an extreme event that occurs naturally and causes harm to humans, properties and environments.
Resilience	the capacity of a system to absorb disturbance and reorganise while undergoing change, so as to still retain essentially the same function, structure, identity and feedback.
Risk	probability that loss will occur as the result of an adverse phenomenon happening or the expected losses (of lives, persons

	injured, property damaged, and economic activities disrupted) due to it.
SMEs (manufacturing)	Companies with sales turnover not exceeding RM50 million OR full-time employees not exceeding 200 workers.
SMEs (services and other sectors)	companies with sales turnover not exceeding RM20 million OR full-time employees not exceeding 75 workers.
Vulnerability	the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of natural hazards.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The aim of this chapter is to provide a general overview of the thesis. It begins with a section that discusses the background of the study, focusing on the impacts of disasters resulting from natural hazards to developing countries generally. This then leads to a discussion of the problem faced by small and medium sized enterprises (SMEs) in Malaysia after being hit by natural disasters. The research aims, objectives and questions are then presented in the next section. A brief explanation of the research methodology employed in this study is also included. The final section outlines the organisation of the thesis.

1.2 Background to the research

In the last 15 years, the world has seen a significant increase in the number of natural hazards around the globe. Data by the Emergency Events Database (EM-DAT) show that the reported occurrence of disasters has increased by 63 percent while the number of reported deaths has increased by more than 85 percent. Within the same period, economic damages caused by natural hazards also increased by more than 120 percent. Table 1 shows the comparison of natural hazards' impacts since 1985.

Table 1: Impacts of natural hazards

Period	1985 - 1999	2000 - 2014	Percentage (%)
Occurrence	3 981	6 506	63.43 (increased)
People affected	687 633	1 272 868	85.11 (increased)
Economic damages ($'000)	800 368 660	1 777 383 206	122.07 (increased)

Source: D. Guha-Sapir, R. Below, Ph. Hoyois - EM-DAT: International Disaster Database – www.emdat.be – Université Catholique de Louvain – Brussels – Belgium.

The data by EM-DAT also show that in 2014, 46 percent of natural hazards that occurred around the world hit the Asian region. Not only in 2014, data of EM-DAT since 1985 show that the Asian region is the most vulnerable region in the world based on the number of disaster occurrences, number of deaths, number of people affected and economic damages, which account for 50–70 percent of global natural hazards statistics.

The high occurrence of natural hazards in the Asian region not only affected individuals but also businesses, including multinational, medium and small sized businesses. For example, during the Thailand flood 2011, the Department of Industrial Works reported that more than 7510 industrial plants around Thailand were damaged by the flood and 70 percent of the businesses operated in these industrial plants were small and medium sized businesses. However, the statistics by the Department of Industrial Works only covered SMEs in the manufacturing sector. Overall, 557 637 SMEs were affected in the Thailand flood 2011 which lead to 2.3 million workers losing their jobs and according to the World Bank, the economic damage caused by this disaster was estimated as at least USD45.7 billion, most of it suffered by the SMEs. In addition, SMEs are the economic backbone for Thailand and account for 99 percent of total businesses in Thailand and according to a report by the AON Benfield, the economic losses suffered by these SMEs resulted in the decrease of Thailand's gross domestic product (GDP) by 9 percent.

Similar situations can be seen in other Asian countries. In Malaysia, for example, SMEs also play a significant role for economic development, contributing 32 percent of the country's GDP, hiring 59 percent of the nation's workforce and providing 19 percent of the nation's exports in 2010 (National SME Development Council, 2013) . However, due to an unprecedented flood which hit Kelantan state in December 2014, the Ministry of International Trade and Industry (MITI) stated that more than 13 000 SMEs were affected during the disaster.

In Philippines, SMEs provide a living for 65 percent of the total workforce in this country and contribute a significant figure to the country's GDP. However, due to the Typhoon Haiyan, the damages to the economy are estimated to be around 15 percent of the Philippines' GDP in 2013.

Furthermore, these situations also occur in developed countries. According to the Asian Disaster Reduction Center (ADRC), as a result of the earthquake and tsunami that struck Japan in March 2011, 90 percent of surveyed small businesses went bankrupt due to damage to production and supply chain disruption.

In reality, all countries are facing the negative impacts of disasters, but it is often the poor who are most vulnerable to risk and who have a lower capacity to survive and to recover during and after disasters (Göhl, 2008; Huq et al., 2004; Smith, 2013). However, SMEs are the most affected and have high vulnerability especially towards natural hazards. The nature of their business, lack of financial and expertise capabilities, results in them having low resilience. Many studies show that SMEs are experiencing difficulties in continuing their business operations after being hit by large scale disasters, even though they have a significant contribution to the economic development of a country, including developing countries.

Therefore, numerous studies (ADRC, 2012; Allen, 2012; Anonymous, 2006; Elliott, Swartz, & Herbane, 2010; Falkner & Hiebl, 2015; Gutter & Saleem, 2005; Herbane, 2013a; Leopoulos, Kirytopoulos, & Malandrakis, 2006; Kato & Charoenrat, 2018) agree that Business Continuity Management (BCM) is an approach that can be used by SMEs to deal with this problem. The BCM was introduced more than 30 years ago but its implementation among SMEs in developing countries is hard to be seen. In the last 30 years, BCM was used only by multinational and large companies to deal with information technology (IT) and computer problems. However, nowadays, many SMEs in developed countries have started to use it as a disaster management approach

(Allen, 2012; Fisher, Chmutina, & Bosher, 2015; Herbane, 2013; Keskitalo, Vulturius, & Scholten, 2014; Wedawatta & Ingirige, 2012). In addition, the governments of developed countries have also started to provide BCM guidelines for SMEs in their countries, such as Japan (Maruya, 2010) and New Zealand (Hatton, Seville, & Vargo, 2012).

1.3 Problem statement

Small and Medium Sized Enterprises (SMEs) play an important part in the economy of most countries. They play a crucial role in terms of social inclusion, local employment and innovation (Clemo, 2008; Falkner & Hiebl, 2015; Kato & Charoenrat, 2018). For the developed world, such as the European Union (EU), around 99 percent of the economic activities can be traced back to SMEs, which account for almost 66 percent of all jobs in private sectors (Gama & Geraldes, 2012). In addition, The SME International Malaysia (2013) stated that some advanced economies have succeeded because small and medium enterprises form a fundamental part of the economies, comprising over 98 percent of total establishments and contributing to over 65 percent of employment as well as over 50 percent of the GDP.

A similar scenario can be seen in the developing world. According to Asia-Pacific Co-operation (APEC), in every country in the Asia-Pacific Economic Co-operation in 2010, SMEs account for over 90 percent of all enterprises.

These SMEs not only create income for their households and families, but they are also able to generate economies for local people by providing jobs and supply chain opportunities (Sievers & Vandenberg, 2007). In addition, SMEs are usually a simpler organisation thus they are more flexible and faster in responding to changes around them (Lopez & Hiebl, 2014). The flexibility is important for SMEs for them to respond quickly to customers' demands (Kayanula & Quartey, 2000).

The existence of SMEs can also contribute to increasing tax-incomes for government and enables the government in the long run to invest the money (Karikomi, 1998; Woldu & Ponnala, 2011), for example, in health care and education systems. Therefore, SMEs are viewed as a significant element of a healthy and growing economy. SMEs are believed to provide an energy not only for the developed countries, but also to developing and least developed countries.

One country that highly depends on SMEs for its economic growth is Malaysia, which has enjoyed growth rates averaging 5.7 percent since 2010 and this figure is one of the highest among developing countries[1]. In Malaysia, SMEs contributed 32 percent of the country's GDP, hired 59 percent of the nation's workforce and provided 19 percent of the nation's exports in 2010 (National SME Development Council, 2013) . The above GDP figures are expected to grow further in 2020 up to 41 percent (Khan & Khalique, 2014).

However, in order to achieve the 41 percent target, there are a few problems and challenges associated with SMEs which need to be tackled by the government. Among the challenges commonly faced by SMEs as suggested by Khan and Khalique (2014) are financing and working capital. However, there is another challenge that is always overlooked by the SMEs and government; business continuity plan or post disasters plan. This issue is very important because SMEs are also exposed to many natural hazards and their survival after the hazards is still questionable. Because of the usually low equity ratio of SMEs, they are more vulnerable to external threat such as natural hazards, compared to larger enterprises.

Due to their size and financial capabilities, SMEs have a high level of vulnerability towards natural hazards. Many studies have been done in correlating this issue. A study by Falkner and Hiebl

[1] http://www.worldbank.org/en/country/malaysia/overview

(2015) suggested that SMEs are exposed to natural and man-made disasters depending on a few factors, mainly location and nature of business. The Asian Disaster Reduction Center (ADRC) in its survey in 2012 found that SMEs in Asia Pacific Countries are threatened by at least 14 disasters, including earthquakes, floods, hurricanes, pandemics, terrorism and nuclear. In addition, Kato & Charoenrat (2018) stated that the Asian Pacific region is the most disaster prone region in the world, experiencing around 43 percent of disasters that occurred globally between 2003 and 2013.

The impacts of natural hazards to SMEs are very high all over the world in developed or developing countries. For example, when an earthquake hit Japan in March 2011, 656 SMEs, which employed more than 10,000 workers, bankrupted within one year after the disaster. Only 12 percent of those SMEs were located in the affected area while the rest were SMEs located all over Japan (ADRC, 2012). That means, disasters not only disrupt the infrastructures and economy of the affected area, but also disrupt the businesses' supply chains which can easily give negative impacts to the bigger geographic parameter.

However, the impacts of natural hazards to developing countries are more terrible. For example, in the Bangkok flood in 2011, at least 550,000 SMEs were disrupted and more than 2 million jobs affected. The flood also reduced Thailand's national GDP by 37 percent (Fernquest, 2011). Similarly in Malaysia, and according to the Ministry of International Trade and Industry, the great flood hit Kelantan state in December 2014 and 13,337 SMEs were affected. This figure comprised 37.7 percent of all SMEs in Kelantan state. Based on this comparison and explanations before, all countries are facing the negative impacts of the disasters but it is often the poor who are more vulnerable to the risk of disasters and who have a lower capacity to cope and recover during and after disasters (Göhl, 2008; Huq et al., 2004; Smith, 2013). Therefore, it is important to note that one lesson learned from past disasters such as the Thailand flood 2011 and the Kelantan flood

2014, is to provide appropriate protection to SMEs because SMEs play significant roles in stimulating economic activities in developing countries.

One approach that can be used to reduce business losses of SMEs due to natural disasters is through proper Business Continuity Management (BCM). However, business continuity is only a common term among SMEs in developed countries. For example, in the United Kingdom, most of the local governments have established business continuity guidelines for small businesses on their website in accordance with the 2004 Civil Contingencies Act 2004 (Fisher et al., 2015; Herbane, 2013) . The government of Japan introduced the Business Continuity Guidelines in 2005 which cover all categories of business including SMEs (Maruya, 2010). For developing countries such as Malaysia, business continuity is only adopted by large and multinational firms (Chatterjee, Shiwaku, Gupta, Nakano, & Shaw, 2015). In addition, currently there are no rules and regulations or requirements for any firm in Malaysia to adopt business continuity management guidelines in its firm.

Without proper business continuity management, SMEs in Malaysia are struggling to continue their business after being hit by natural hazards. After the giant flood in the East Coast of Malaysia in 2014, which affected more than 13,000 SMEs in Kelantan state, the Malaysian SME Corporation Berhad (SMECorp) forecasted less than 10 percent of these SMEs were expected to continue their operation within six months.

Therefore, it is important for those SMEs in Malaysia to have proper BCM guidelines in order to increase disaster resilience among the SMEs. For that reason, this research will try to propose a BCM framework that can be used to improve the resilience of Malaysian SMEs to the impact of natural hazards.

1.4 Research aim and objectives

The aim of this research is to develop a Business Continuity Management (BCM) framework that can be used to improve the disaster resilience of Malaysian Small and Medium Sized Enterprises (SMEs). The specific objectives of this research are to:

- Examine the impacts of natural hazards towards SMEs in Malaysia;
- Assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs reducing the impacts of natural hazards in Malaysia;
- Identify SMEs' perception of the BCM and existing disaster risk reduction (DRR) programs in Malaysia;
- Assess the key issues that affect the BCM and disaster resilience of SMEs to natural hazards; and
- Develop and recommend a BCM framework as a DRR approach for SMEs in managing disasters in Malaysia.

1.5 Research questions

Based on the research aim and objectives in the previous section, five research questions were developed as follows:

1. How do natural hazards affect SMEs in Malaysia?
2. What are the roles played by related parties in supporting SMEs to manage natural hazards in Malaysia?
3. What are the perceptions of SMEs towards the BCM and existing DRR programs in Malaysia?

4. What are the factors that determine the BCM and disaster resilience of SMEs in Malaysia?

5. Can a guideline be developed for SMEs in managing disasters in Malaysia?

1.6 Need for the research

The need for the research is seen from three different perspectives: SMEs, policy makers and academia. From the SMEs' perspective, it is important in order to (1) develop a new BCM framework which can be used by SMEs to increase their disaster resilience; (2) identify the key issues that affect the disaster resilience of SMEs to natural hazards; and (3) encourage awareness of SMEs in Malaysia to existing disaster risk reduction (DRR) programmes in Malaysia.

From the policy makers' perspective, the proposed framework can be used in order to (1) promote BCM practices among SMEs through future DRR programmes; (2) identify issues among SMEs which need participation from various stakeholders including the government, private companies and NGOs; and (3) discover the perceptions of SMEs in Malaysia on the existing DRR programs.

From the academic perspective, this research will establish a new broad area to be explored by researchers in Malaysia in order to improve the proposed conceptual framework in the future.

1.7 Research target and scope

This research focuses on BCM for SMEs in Malaysia. Malaysia is chosen because, currently, there is no BCM framework to deal with disasters at a national level, specifically designed for SMEs. The BCM frameworks in Malaysia are currently applied by large and multinational companies and most focus on information technology and computer issues. Therefore, this research will focus on exploring the impact of natural hazards on SMEs and identifying the perceptions of SMEs on existing DRR programmes. It will then concentrate on the involvement of various stakeholders in

order to explore how they can participate in developing a comprehensive framework or guidelines for DRR. The target stakeholders for this research include government as policy maker, the private sector and non-government organisations (NGOs). Meanwhile, the SMEs investigated meet the criteria stated in its definition by the Malaysian SME Corporation in 2013.

1.8 Research methodology

The methodology used for this research was divided into three phases: (1) preliminary; (2) data collection; and (3) validity and reliability.

In the preliminary phase, an exploratory study through primary and secondary sources was carried out. At the same time, the research philosophy, approach, strategy, time horizon and data collection methods were identified.

Analysis of the literature from previous research, government reports, newspapers and online resources made it possible to identify the research gap and develop an initial conceptual framework. After the research gap had been identified, exploratory interviews to explore, understand and confirm it were held. The respondents of this interview session came from various backgrounds: government officers, academicians and practitioners.

The second phase was data collection, through analysis of secondary data and a survey. The purpose of the secondary data analysis is: (1) to assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs to reduce the impact of natural disaster in Malaysia in order to achieve the second research objective (**RO2**); and (2) to improve the initial conceptual framework to be used for this research. The secondary data analysed here includes government documents, previous research, newspaper reports and internet databases. Publications from international organisations are also useful in this phase.

A survey among SME owners was also conducted in this second phase. The purpose is: (1) to examine the impact of natural disasters on SMEs in order to achieve the first research objective (**RO1**); (2) to identify SMEs' perception of existing DRR programmes in Malaysia, to achieve the third research objective (**RO3**); and (3) to assess the key issues that affect the disaster resilience of SMEs to natural hazards, to achieve the fourth research objectives (**RO4**). The survey was also used to obtain new input for the development of the conceptual framework.

The final phase of the research was the validity and reliability phase. In this phase, another interview session was conducted in order to validate the framework. Respondents are experts in the area of this research and came from various backgrounds including government agencies and the private sector. At the same time, reliability tests were conducted to check data consistency for the survey.

1.9 Organisation of thesis

The organisation of this thesis is summarised in Figure 1 below. These chapters represent four different phases. The first phase consists of three chapters concerning the development of understanding the topic under study within the reviews of related contextual and theoretical literature. Chapter 1 provides an overview of this research study, with the aim of giving background and justification for the significance of this study. The research aims, objectives and research questions are also provided. Chapter 2 focuses on providing an overview of literature reviews which cover related concepts of this research including disaster management, SMEs, business resilient and BCM. Chapter 2 also provides the development of the research gap and proposed initial conceptual framework. The current situation in Malaysia is covered in Chapter 3, and includes the national disaster management policies, natural disasters in Malaysia and development and roles of SMEs in Malaysia.

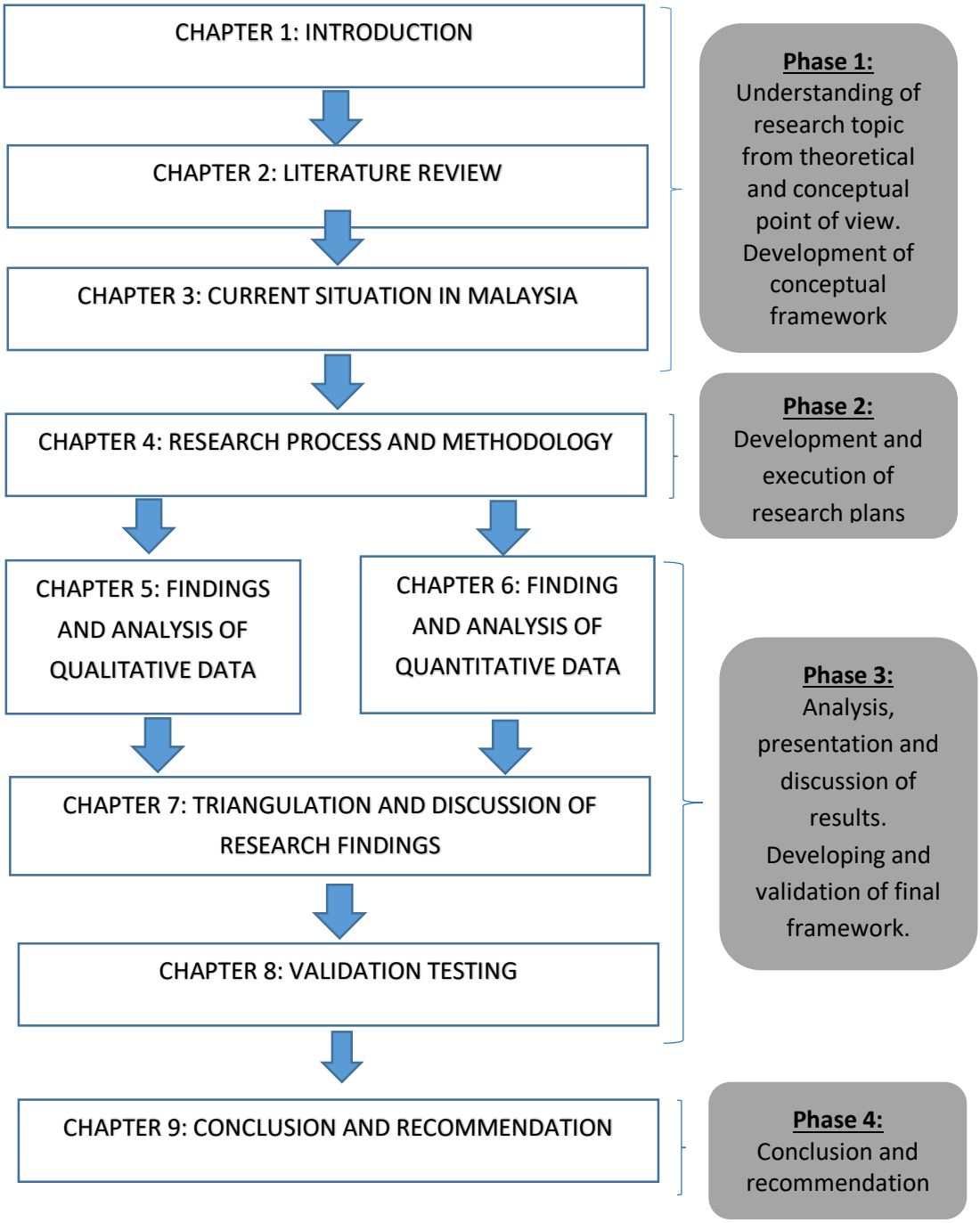

Figure 1: Organization of the thesis

The following phase concentrates on the development and execution plan of actions related to the methodology applied in this study. These are presented in Chapter 4, where general discussions on issues related to the research design are provided. Detailed descriptions of the data collection method applied in this study are also discussed, and include the development and administration of the interviews and survey.

The next phase focuses on the analysis, presentation of results, development of a framework and validation testing which are presented in five different chapters. Chapters 5 and 6 aim to present the results of the qualitative and quantitative data collected from interviews and survey. Chapter 5 contains the findings from the interviews conducted in order to confirm and understand the research topic and also to get new input for the proposed conceptual framework. Chapter 6 contains the results from a survey which was conducted among SMEs in Malaysia in order to get a deeper perspective of the SME owners on the research topic. Various techniques including descriptive, parametric and non-parametric analysis were used and are presented in this chapter. Chapter 7 demonstrates how triangulation technique is used from literature reviews, qualitative and quantitative results to establish discussions of the research finding. After the discussion, validation testing is carried out in Chapter 8, while the final conceptual framework on business continuity management (BCM) among SMEs in Malaysia is demonstrated. The final phase comprises Chapter 9, which focuses on the conclusion, limitations of this study and recommendations for future research.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section investigates the literature related to the subject areas. First, it explores the concept of disasters, disaster management and the vulnerability of business to disasters. It then covers the relationship between SMEs and disasters by exploring definitions of SMEs, their contribution to economic development and the impact of disasters on SMEs. Lastly, this section examines business and disaster resilience among SMEs by examining the concept of resilience, and implementation of BCM among SMEs.

2.2 Disasters

In the last 20 years, the world has been shocked by some of the worst disasters ever recorded, such as the series of earthquakes in China, the cyclones in Orissa, India in 1997, the Indian Ocean tsunami in 2004, cyclones Sidr in 2007 and Nagris in 2008 that hit Bangladesh and Myanmar, and the series of typhoons in the Philippines. In 2005 and 2012, when hurricanes Katrina and Sandy hit the southern and eastern states of the USA, it became clear that disaster can occur anywhere, to developed, developing and the least developed countries. In reality, all countries are facing the negative impacts of disasters, but it is often the poor who are most vulnerable to risk and who have a lower capacity to survive and to recover during and after disasters (Göhl, 2008; Huq et al., 2004; Smith, 2013).

2.2.1 Definitions and impact of disaster

First, it is important to discuss the definitions of disaster as seen from various perspectives. Human and material losses are higher when there are no policies and strategies for the management of

disaster, or the policies and strategies are not well implemented. Financial aspects are always crucial for developing countries and the least developed countries in mitigating the risks of natural disaster. Disasters are not caused by natural hazards alone but are also the product of the social, political and economic environment, and all these factors must be considered in relation to each other (Pelling, Özerdem, & Barakat, 2002; Waugh & Streib, 2006; Wisner, 2004).

A widely accepted definition of disaster is that of the International Strategy for Disaster Reduction (ISDR) in its 2004 annual report: "*a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources."*

More generally, the Oxford English Dictionary defines disaster as "*anything that befalls of ruinous or distressing nature; a sudden or great misfortune, mishap, or misadventure; a calamity*". Parker and Handmer (2013) define a disaster as "*an unusual natural or man-made event, including an event caused by failure of technological systems, which temporarily crushes the response capacity of human communities, groups of individuals or natural environment and which causes massive damage, economic loss, disruption, injury, and/or loss of life*". Britton (1986) suggested that a disaster is a social event, where the tendency for damage is dependent upon the interplay between humans and their use of the physical and social world, while Baumwoll (2008) argued that a disaster consists of the occurrence of a hazard or event that may cause harm, and the inability of a society to manage the consequences of the event.

These definitions cover several features of disasters. They are events of great magnitude which cause loss and disruption. They usually occur suddenly, but their impact is experienced over a long period. The definitions also make the point that overcoming the impact of disasters takes a lot of

effort and sometimes even requires help from others. Another feature is that disasters may be natural, such as earthquakes, floods and storms; or man-made, such as fire, war and terrorism.

According to Holland (1993), there are several concepts closely related to disasters. A disaster is a phenomenon which occurs at a certain place. The probability of occurrence of a potentially damaging phenomenon within a certain timeframe is referred to as a hazard. This is a situation which may result in an event which can have negative consequences. Vulnerability, on the other hand, refers to how susceptible a place is. It is the extent to which a community's structure, services or environment are likely to be damaged or disrupted by the impact of a hazard. Risk refers to the probability that loss will occur as the result of an adverse phenomenon happening or the expected losses (of lives, persons injured, property damaged, and economic activities disrupted) due to it.

In terms of loss of life and impact on the economy, disasters hit hardest where many poor people are affected (Skidmore & Toya, 2013; Smith, 2013; Yodmani, 2001). In 2012, 124.5 million people were exposed to natural disasters, of whom 9,655 were killed; 68.2 percent of the recorded disaster mortality is accounted for from lower-middle income countries (Guha-Sapir, Hoyois, & Below, 2013). According to a statistic published by *Preventionweb*, earthquake, storms and floods have accounted for 80 percent of loss of life and 90 percent of economic losses linked to natural hazards in Asian countries in the last three decades. Epidemics and famine, the next most significant cause of loss of life in these countries, are strongly linked to meteorological and hydrological conditions. According to a background paper presented in the 2017 Leader's Forum for Disaster Risk Reduction, economic losses due to disasters are increasing dramatically around the world. For the first time, annual economic losses from disasters have exceeded USD$100 billion for five consecutive years (USD$132 billion in 2010, USD$364 billion in 2011, USD$156 billion in 2012, USD$119 billion in 2013, and USD$110 billion in 2014). Over the last decade

these economic losses have reached almost $1.4 trillion[2]. In addition, the ongoing process of climate change will result in increased intensity, frequency and variability in the patterns of those hazards (UNECA, 2008). Therefore, disasters have negative impacts not only on people's lives, but also on the economy.

2.2.2 Disaster management

Disaster management is a body of policy and administrative decisions and operational activities which refer to the various stages of a disaster at all levels. It is a systematic process which is based on the key management principles of planning, organising, leading, coordinating and controlling (Zaveri, 2012).

Because such extreme events continuously occur, a rising commitment can be seen among development organisations, donors and national governments of disaster-prone countries to recognise the negative impact of natural hazards on development projects. Traditionally, developing countries emphasised the emergency response systems and agencies in handling disaster risks, but now they take a more proactive developmental approach integrating disaster preparedness, mitigation and preventive measures for planning to reduce the vulnerability of human populations to disasters (Göhl, 2008).

In 1989, as stated in the United Nations International Strategy on Risk Reduction (UNISDR) 2004 report, a global programme to reduce losses from natural hazards was developed by the United Nations General Assembly, which proclaimed the 1990s as the International Decade for Natural Disaster Reduction (IDNDR). International conventions (for example, Rio de Janeiro in 1992, and World Conferences for Disaster in Yokohama in 1994 and Kobe in 2005) emphasise the necessity

[2] https://www.unisdr.org/files/globalplatform/entry_bg_paper~leadersforumbackgroundpaper.pdf

to foster prevention and mitigation as well as strengthen decentralised and especially local capacities, as stated in the Hyogo Declaration from the second World Conference in Kobe in 2005:

"We affirm that States have the primary responsibility to protect the people and property on their territory from hazards, and thus, it is vital to give high priority to disaster risk reduction in national policy […]. We concur that strengthening community level capacities to reduce disaster risk at the local level is especially needed, considering that appropriate disaster reduction measures at that level enable the communities and individuals to reduce significantly their vulnerability to hazards."

This declaration recognises the need to strengthen local community-level capacities for DRR. The emphasis is on the very important responsibility of governments to develop strategies and policies through the fostering of local capacities and to reduce exposure to hazards in order to promote social and economic development. Based on the Hyogo Declaration, all countries have started to draft and plan strategies on mitigating disaster risks.

Most of the studies in disaster management propose two phases of management: pre-disaster and post-disaster (Freeman et al., 2003; Mechler, 2004). However, most of these studies have ignored another important phase: during disaster. This phase is important because emergency systems provided and response or actions taken during a disaster will assist survival of the disasters' victims (Mileti & O'Brien, 1992). Communication systems and information sharing are critical during a disaster, and their absence creates difficulties in implementing effective and efficient emergency response systems (Dantas, Seville, & Nicholson, 2006).

Based on a timeframe proposed by Göhl (2008), the disaster-management process can thus be divided into three phases: before, during and after. Disaster risk management is part of the disaster-

management process, which focuses on the "before" of an extreme natural disaster; the "during" and "after" of a disaster are anticipated through risk analysis. In order to create a deep understanding of disaster management, this study will divide it into the three phases, but will focus on the pre-disaster phase which consists of the "disaster risk management" approach.

The next section will explain disaster risk management, which is determined as the main element in the pre-disaster or "before" phase. In the "during" phase, emergency systems and planning designed by policy makers and communities play significant roles in determining the behaviour and pattern of the disaster's victims (Perry, 1979). Among the challenges that should be highlighted by authority during the disaster are communication systems and information sharing (Dantas et al., 2006; Dynes, 1990).

In the post-disaster or "after" phase, two main elements are identified in the timeframe proposed by (Göhl, 2008): rehabilitation and reconstruction. These refer to programmes and activities that provide longer-term assistance for people who have suffered injury or incurred losses. The objective is to facilitate the return of these communities to their pre-disaster condition (Freeman et al., 2003).

Rehabilitation encompasses repairing and reconstructing houses, commercial establishments, public buildings, lifelines and infrastructure; restoring and coordinating vital community services; expediting permit procedures; and coordinating activities among governments. Recovery can take a few weeks or several years, depending on the disaster's magnitude and the reconstruction resources available.

2.2.3 Vulnerability of businesses

The term vulnerability has received much attention in the last two decades, especially in socio-economic development, despite being a concept that is hard to assess and measure because of difficulty in quantifying its indicators (Aven, 2011; Birkmann, 2007). Generally, vulnerability relates to "*being easily harmed or wounded*", but its meaning goes beyond the focus on physical harm to issues pertaining to hazards and disasters (Mupedziswa, 2012). This suggests that vulnerability is associated with people and their environment, especially human beings' inability to withstand a hostile environment. Environment, in this context, refers to both natural or physical, and social surroundings and conditions. The Oxford Dictionary defines vulnerability as "*open to attack or injury or criticism*". This suggests that the term vulnerability also extends to issues related to social and psychological harm.

Definitions of vulnerability vary depending on the context. In the context of disaster, Blaikie, Cannon, Davis and Wisner (2014) define it as "*the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of natural hazards*." Vulnerability also refers to "*uncertainty, risk and emotional exposure*" and "*the core, the heart, the centre of meaningful human experiences*" (Brown, 2012; Mupedziswa, 2012). In addition, Mupedziswa (2012) states that being vulnerable is not a choice one has to make, but rather how the individual chooses to respond when visited by the elements of vulnerability.

Much research has been conducted on the subject of vulnerability. According to Mupedziswa (2012), it covers complex multidisciplinary fields including development and poverty, climate, public health, security, geography, disaster and risk management, political ecology and business and economics. For the purpose of this research, business vulnerability will be emphasised and discussed especially in the context of small business.

Vulnerability among businesses can be divided into categories suggested by Zhang, Lindell, and Prater (2009): capital, labour, supplier and customer vulnerability. These vulnerabilities affect all businesses including SMEs. Loss of capital is the first item. Capital in the business context includes fixed assets (buildings, land, furnishings and vehicles) and current assets (cash, inventories, marketable securities and accounts receivable). Fixed assets and inventories are highly exposed to damage by natural disasters such as flooding, because of their low mobility and being subject to direct physical damage.

Employee casualties (death, injury and illness) of disasters are another threat for business, categorised as labour vulnerability by Zhang et al. (2009). In the worst scenario, the casualty occurs to the key person in the business. For SMEs, this problem is a major threat because of the small number of employees and difficulty in hiring highly skilled people.

Interruption of water/sewerage, electricity, fuel, telecommunications and transport is normal condition during and after disasters. For businesses, this is a major problem because it results in interruption to business production and operation. In addition, the small business might lose its supply of raw materials because the supply chain is interrupted between the affected and other areas (Waters, 2011).

Similarly, businesses can lose customers during and after disasters because of population casualty and short-term dislocation. In addition, demographic changes in disaster-stricken areas can destroy the established customer base of local businesses.

Finally, financial vulnerability: Gutter and Saleem (2005) and McGuinness and Hogan (2014) insist that financial capability is important for small businesses and it is an especially important

factor in determining the survival of the business after disaster. This research will consider the significance of financial vulnerability of SMEs in the next section.

2.3 Small and medium sized enterprises (SMEs)

SMEs play a significant role in the business world today, especially in developing countries where, APEC claims, they account for more that 90 percent of total enterprises. Although much research has been conducted to discover the importance of SMEs from various perspectives, including financial sources, capital structure and supply chains, little attention has been given to studying the relationship of SMEs and disasters, particularly in developing countries.

Therefore, the purpose of this research is to develop a BCM framework that can be used to improve the disaster resilience of SMEs in Malaysia. However, before concentrating on the main topic, it is important to explore the concepts and definitions of SME around the globe.

2.3.1 Definitions and scope

The abbreviation SME has a wide range of definitions, varying from country to country and between the sources reporting SME statistics. These definitions are influenced by certain criteria such as the number of employees, total net assets, sales and investment level. The most common definitional basis used is the number of employees and sales turnover (Abbrey, Bagah, & Wulifan, 2015; S. C. Malaysia, 2013). However, Leopoulos et al. (2006) and Smith and Watts (1992), defined SME based on their geographical placement, the level of development of the country, and country-specific legislation.

According to Kayanula and Quartey (2000), the Bolton Committee of 1971 was the first to provide a solid definition of SME: "*a firm is regarded as small if it meets the following three criteria, such*

as, it has relatively small share of the market place, it is managed by owners in a personalized way of management structure, it doesn't form part of a large enterprise."

Development institutions such as the World Bank, the US Agency for International Development (USAID), and the United Nations Industrial Development Organization (UNIDO) also give alternative definitions. The World Bank defines SME according to the number of employees and maximum assets; an SME is a manufacturer or service provider with a maximum of 300 employees and maximum assets of USD$15,000,000. According to USAID, firms with fewer than 50 employees are small, while for UNIDO firms with 10 to 49 workers and a registered capital of more than USD$42,300 could be grouped in the category of small enterprises; whereas medium enterprises employ between 50 and 249 employees and have a registered capital of more than USD$42,300.

However, financial agencies use different definitions and indicators in classifying SMEs. For example, the Multilateral Investment Guarantee Agency (MIGA) and the International Finance Corporation (IFC) define small enterprises as those that meet two of the following three conditions: fewer than 50 employees, less than USD$3 million total assets and less than USD$3 million total annual sales. The Asian Development Bank (ADB) has no official definition, preferring only the definitions of individual national governments (Gibson & Van der Vaart, 2008).

Different definitions can be seen in developed, developing and least developed countries. In the USA and Europe, SMEs (if defined according to the number of employees and turnover) would be the definition adopted for a large enterprise in Africa. For example, Fay and Clack (2000), the European Commission (EC) and the Organization for Economic Cooperation and Development (OECD) (whose membership includes European and Asian countries like Japan) define SMEs as having below 500 employees. In Malaysia, the definition is separated for manufacturers and

service providers; according to the SME Corp Malaysia, for manufacturers, the number of full-time employees must not exceed 200, while for service providers, the maximum number is 75. On the other hand, Ethiopia defines SMEs as having 10 or fewer employees (Woldu, 2011).

In terms of annual turnover, again, the acceptable definition and indicators differ from country to country, based on the level of the economy. In the USA, for example, the definition of a medium business is "an entity with average annual gross revenues for the preceding three years not to exceed $7 million, and very small business as an entity with average annual gross revenues for the preceding three years not to exceed $250,000" (US International Trade Commission, 2010) . In Ethiopia, small enterprises are defined by their paid up capital, which is more than Birr 20,000 ($2,500) but not more than Birr 500,000 ($62,500) (Woldu, 2011)

Therefore, it is difficult to agree on a specific definition of SME. However, since this study will emphasise SMEs in Malaysia, it will use the definition endorsed by the Malaysian SME Corporation in 2013, which is simplified as follows:

- *Manufacturing: Sales turnover not exceeding RM50 million OR full-time employees not exceeding 200 workers*
- *Services and other sectors: Sales turnover not exceeding RM20 million OR full-time employees not exceeding 75 workers*.

A business will be deemed an SME if it meets either of the two specified qualifying criteria, namely sales turnover or number of full-time employees, whichever is lower.

2.3.2 The role of SMEs in the development progress of a country

SMEs are a very important part of the economy in most countries. They play a crucial role in terms of social inclusion, local employment and innovation (Clemo, 2008; Falkner & Hiebl, 2015). For

developed nations, such as those of the European Union, around 99 percent of economic activities can be traced back to SMEs, accounting for almost 66 percent of all jobs in the private sector (Gama & Geraldes, 2012)

The same scenario can be seen in the developing world. According to APEC, in every country in the Asia-Pacific Economic Co-operation in 2010, SMEs accounted for over 90 percent of all enterprises. The SME International Malaysia (2013) suggested that some advanced economies have succeeded because SMEs are a fundamental part of their economies, comprising over 98 percent of total establishments and contributing to over 65 percent of employment and over 50 percent of GDP.

These SMEs not only create income for households and families, but they also develop the economy for local people by providing jobs and supply-chain opportunities (Sievers & Vandenberg, 2007). In addition, SMEs usually have simpler organisation and are thus more flexible and faster in responding to change (Lopez & Hiebl, 2014), especially in responding quickly to customers' demands (Kayanula & Quartey, 2000).

The existence of SMEs can also increase government revenue from taxation, enabling it to invest in, for example, healthcare and education (Jamali, Lund-Thomsen, & Jeppesen, 2015; Sievers & Vandenberg, 2007). SMEs are therefore viewed as a significant indicator of a healthy and growing economy, whatever the nation's stage of development.

2.3.3 SMEs and natural hazards

Due to their size and financial limitations, SMEs are especially vulnerable to disasters. Falkner and Hiebl (2015), for example, suggested that SMEs are exposed to both natural and man-made disasters, mainly because of lack of financial expertise, but also geographical location. The Asian

Disaster Reduction Center (ADRC) in 2012 found that SMEs in Asian-Pacific countries, for example, are threatened by at least 14 disasters a year, including earthquakes, floods, hurricanes, pandemics, terrorism and nuclear accidents.

The impact of natural hazards on SMEs is high all over the world, including in developed countries. In Japan, for example, when an earthquake hit in March 2011, 656 SMEs employing a total of more than 10,000 workers, went bankrupt within a year. Interestingly, only 12 percent of these SMEs were located in the affected area, and the rest throughout Japan (ADRC, 2012). That is, disasters not only disrupt the infrastructure and economy of the affected area, but also the supply chains which can have a negative impact on the wider geographic area.

However, the impact of disaster on developing countries is even higher. For example, in the Bangkok flood of 2011, at least 550,000 SMEs were disrupted and more than 2 million jobs affected. The flood also reduced Thailand's national GDP by 37 percent (Fernquest, 2011). Similarly, the great flood in Kelantan state in December 2014, already referred to, affected 13,337 SMEs; this figure represented 37.7 percent of all SMEs in Kelantan state. As stated before, all countries face the negative impacts of natural hazards, but the poorest tend to be most vulnerable to this risk and have a lower capacity to recover during and after the disaster (Göhl, 2008; Huq et al., 2004; Smith, 2013). Therefore, one important lesson to be learned from past disasters such as the Thailand and Kelantan floods is the need to provide appropriate protection to SMEs, which play such a significant role in stimulating economic activities in developing countries.

SMEs elsewhere are not necessarily well prepared for dealing with disaster. Only 59 percent of UK SMEs had flood insurance to cover them from business interruption and loss of earnings (Clemo, 2008). A worse situation can be seen in developing countries such as Thailand, where only 14 percent of the SMEs affected by the Bangkok floods of 2011 were covered by flood

insurance (Perwaiz, 2015). Even though no specific reasons were given for this, affordability could be one significant factor why SMEs in developing countries are not protected by disaster insurance.

Disaster insurance and other financial tools could play significant roles as disaster recovery instruments for SMEs, if affordability were not an issue. Therefore, government and private sectors must work together and provide a platform for SMEs to reduce the financial burden of managing disaster.

In conclusion, SMEs are very important in motivating economic activities within a country, so ensuring their survival during and after disasters is essential. Government should learn from previous disasters, such as the Japan tsunami and the Thailand flood of 2011, about how these disasters can affect SMEs and therefore GDP.

Another lesson that can be learnt from these catastrophes is the lack of disaster resilience among SMEs. As a consequence, many SMEs were not able to survive after being hit by disasters, in Thailand, Japan, Malaysia and other countries. In particular, before the disasters hit these countries, there had been no action by government or other stakeholders in helping SMEs to address these issues, especially in developing countries such as Thailand and Malaysia.

2.4 Role of stakeholders

Many previous studies have investigated the role of stakeholders in managing disasters to SMEs, including government (Coppola, 2006; Herbane, 2013a; Maruya, 2010), the private sector (Chatterjee & Shaw, 2015a; Li, 2015; Shaw & Izumi, 2015) and NGOs (Li, 2015).

Government is the main stakeholder that should play a significant role in dealing with disasters and SMEs. Herbane (2013) proposes that all levels of government, central, state and local, need to be involved. Maruya (2010) indicates that the government of Japan established a disaster

management framework for SMEs in order to reduce or minimise the impact of disasters. In the United Kingdom, all local governments are required to provide disaster management guidelines for SMEs on their websites, in accordance with the 2004 Civil Contingencies Act 2004 (Fisher, Chmutina, & Bosher, 2015). Besides developing the frameworks and guidelines, government also can provide training or disaster management for SMEs (Kusumasari, Alam, & Siddiqui, 2010b). This is important in enhancing SMEs' preparedness and recovery. However, the most important contribution from government is providing funds and allocations specifically for disasters. Without funding, no framework can be established, no training can be provided and the disaster victims cannot be compensated (Sugarman, 2007).

However, given their financial constraints, it is difficult for the governments of developing countries to undertake all these responsibilities. Therefore, private sector companies are another party that can participate. The private sector is an important actor in disaster risk reduction, and its importance has been highlighted after the Sendai Framework for Disaster Risk Reduction was adopted in 2015 (Shaw, 2018). The role of private sectors vary from corporate social responsibility activities and creating a corporate community interface to ensuring that innovative technical solutions for disaster risk reduction are a core business. The participation of private actors in government projects such as disaster management is important in order to deliver better services to the community. The main role of the private sector is to counteract any weakness on the government side (Busch & Givens, 2013). Usually, in disaster management, as mentioned before, finance is one of the main issues faced by government. Through a public-private-partnership (PPP) arrangement, insufficient funding of disaster management programmes can be prevented. Involvement of the private sector will also assist governments to formulate better programmes,

such as social insurance against disaster, because it can provide expertise in complicated matters and their operation (Busch & Givens, 2013; Khan, Roddick, & Roberts, 2013; Lassa, 2013).

Another stakeholder that should be involved in disaster management is NGOs. However, in many countries, the roles of NGOs are limited to providing aid during the disaster, even though they would be able to contribute more than this (Mathan & Izumi, 2015). Besides providing assistance during the disaster, NGOs could also be involved in disaster management programmes, including training for SME owners, actively participating in government DRR programmes and providing advice for SMEs affected by disasters (Utomo & Hamdani, 2015). In addition, NGOs can advise governments in establishing disaster management frameworks and guidelines.

Involvement of these stakeholders would help SMEs to increase their resilience. As mentioned before, lack of finance and expertise is the main problem faced by SMEs in managing disaster. Therefore, if all the stakeholders play their roles, these problems could be reduced and resilience increased. The next topic is business resilience and how it is related to BCM, preceded by an exploration of the concept of general resilience.

2.5 Resilience

This section is trying to assess the concept of resilience generally. Then the concept of business resilience and disaster resilience will be discussed before this section discover the requirements in building resilient SME.

2.5.1 Concept of resilience

In his seminal paper in 1973, Holling discussed the concept of resilience, initially in the context of environmental and ecological systems. The concept then evolved considerably, with several studies from the 1970s using different terminologies. For example, Harrison (1979) and Harwell

(1977) used term the "resistant" in discussing the concept of resilience, May (1973) and Orians (1975) "stability", and Cairns and Dickson (1977) "elasticity" (Westman, 1986).

In the 1980s, the concept of resilience was extended to various disciplines such as computing and networking (Colbourn, 1987; Najjar & Gaudiot, 1990) and healthcare (Elder & Clipp, 1989). Prior to and after the millennium, many papers were published on the concept of resilience in healthcare disciplines, and others in economics, community, personal, risk, organisational and political contexts. Walker, Holling, Carpenter and Kinzig (2004) defined resilience as the capacity of a system to absorb disturbance and reorganise while undergoing change, so as to still retain essentially the same function, structure, identity and feedback.

The term resilience was originally derived from the Latin word "resilire", which means "to rebound." Webster's Dictionary defines it as "*1) a: an act of springing back; b: capability of a strained body to recover its size and shape after deformation, esp. when the strain is caused by compressive stressors – called elastic 18 resilience; and 2) the recoverable potential energy of an elastic solid body or structure due to its having been subjected to not exceeding the elastic limit.*" The online Oxford Dictionary defines resilience as "*the ability of a substance or object to spring back into shape" or "the capacity to recover quickly from difficulty; toughness*."

The word "resilience" has different definitions depending on the context in which it is used: business, medicine, community, social networking, economics and personality. In the medical context, Laskowski-Jones (2013) defines resilience as "*capable of withstanding shock without permanent deformation or rupture.*" Rutter (2012), in the psychological context, calls it "*an inference based on evidence that some individuals have a better outcome than others who have experienced a comparable level of adversity*".

Based on these various definitions, Herrman and Stewart (2011) point out that there is no single agreed operational definition of resilience. The scope of the different definitions varies from narrow conceptualisation that focuses exclusively on recovery from trauma, to wider definitions that see resilience as a protective approach (Youssef & Luthans, 2007).

In summary, resilience can be interpreted as a process, while a few studies describe it as an outcome. In addition to process and outcome, it is seen as a dynamic steady state in the face of adversity: Almedom and Glandon (2007) in their study on public health indicate that this means "absence of disease". Wagnild (1993) described resilience as characteristics of people.

Resilience can be viewed from three different perspectives: first, the ability to reinstate to normal conditions (before disaster); second, the time taken to recover from disaster; and third, the ability to adapt to changes brought about by disaster (Burby, 1998; Maguire & Cartwright, 2008; Miles & Chang, 2006). However, these views were established by authors studying community resilience. In other types of resilience, there are other perspectives. For example, Robertson and Cooper (2013) emphasise personal resilience. Fitzpatrick (2009), Hoppes (2011) and Laskowski-Jones (2011) discuss resilience in healthcare, while Rose and Liao (2005) highlight the importance of economic resilience.

However, this study will discuss resilience within the business context because this is significant for SMEs.

2.5.2 Business resilience

Resilience involves understanding different responses to unexpected changes and shocks that push towards innovations (Williams & Vorley, 2014). In the business context, it addresses the "*capacity for an enterprise to survive, adapt, and grow in the face of turbulent change*" (Fiksel, 2006; Hamel

& Valikangas, 2003). Williams and Vorley (2014) argue that resilient businesses are able to respond flexibly to a changing environment, overcome unexpected shocks and remain competitive. They insist that small businesses are more resilient because they are more responsive to unexpected shocks, being more flexible, adaptable and innovative than large enterprises. However, in fact, small businesses are more vulnerable to unexpected events such as disasters because of lack of financial and other expertise, as already explained.

Some authors refer to business resilience as Enterprise Risk Management (ERM) (Simeone, 2015). However, according to the previous definitions, business resilience is more the response of a company to unexpected changes, while ERM is a comprehensive process involving specific phases: planning, organising, leading and controlling[3]. Despite the differences, business resilience and ERM concept still have similar objectives: to minimise risk and deal with crises, and to achieve this objective, commitment from all people inside the business.

In order to deal with unexpected crises, BCM was introduced in the 1970s as a crisis management approach (Herbane, 2010); it can also be used to ensure business resilience (Ee, 2014; Elliott et al., 2010). The concept of business resilience was introduced later than BCM, and many studies such as Elliot, Swartz and Herbane (2002), Rose and Lim (2002) and Paton and Hill (2006) propose that in order to develop a resilient business, a business must first establish its business continuity plan or BCM (Elliott et al., 2010). Furthermore, BCM is believed to be a factor making a business more resilient to adopting change, preparing for uncertainty and remaining in operation during adverse situations, thus adding value to the business (Sim Abdullah, Md Noor, & Mior Ibrahim,

[3] Based on ISO31000: Risk Management Framework.

2015). However, before this research discovers the concept of BCM, this research will examine the features in building disaster resilient business.

2.5.3 Building resilient SME

In the previous section, this research discovered the concept of resilience and business resilience. Now, this research will link the concept of resilience and SMEs in building resilient SMEs. In addition, this research will assess the features of resilient SMEs especially in the context of disaster resilience.

As stated in the previous sections, SMEs played a significance role in the country's development. However, SMEs are also vulnerable to natural hazards (see Section 2.3.3). Vulnerability among businesses can be divided into several categories including capital, labour, supplier and market (Zhang, Lindell, and Prater, 2009). Building resilience is one of the approaches that can be used in order to reduce the vulnerability to natural hazards (Prasad, Altay, Su, & Tata, 2015). Furthermore, the authors added that building resilience can be achieved through a high level of awareness and attentiveness to the potential disruptive effects of a disaster, learning from past disruptions, and tapping in to various forms of social capital, including structural, cognitive, and relational social capital. However, the study by Prasad et al. (2015) focuses on the informal business (micro sized business) and it only looks at the impacts on the supply chain.

Other than that, building resilience also can be achieved when the business has its own coping capacity and coping strategies (Wedawatta, 2013). According to the UNISDR, coping capacity is defined as "*the ability of people, organisations and systems, using available skills and resources, to face and manage adverse conditions, emergencies or disasters.*" Based on this definition, there are several elements to be highlighted including 1) ability of people or organisations, 2) internal resources available, and 3) managing risks or crises. Therefore, for the purpose of this research,

coping capacity is defined as "the ability of the SMEs to control the impacts of natural hazards using available resources and capabilities."

On the other hand, coping strategies are another element in building resilience as mentioned by Wedawatta(2013), and are defined as "*actions that increase the ability to prevent, tolerate and/or recover from the impacts of natural hazards.*" Based on the definition, coping strategies refer to the strategies taken by individuals or organisations to prevent or reduce the impacts of risks. Therefore, for the purpose of this research, coping strategies are defined as "the actions taken by the SMEs to reduce or eliminate the impacts of natural hazards to their business." The coping strategies include developing a business continuity plan, buying disaster related insurance and developing an emergency plan.

Therefore, based on these discussions, resilience of SMEs is built when the SMEs can reduce their vulnerability (Prasad et al., 2015), and develop their coping capacity and coping strategies (Wedawatta, 2013). As stated, developing a business continuity plan is one of the coping strategies that can be used by SMEs. Thus, the next section will examine the concept of BCM in the context of SMEs.

2.6 Business Continuity Management (BCM)

BCM is very important for all organisations, multinational and public limited companies as well as small companies. However, there has been little focus on BCM for SMEs, and this research will investigate its implementation in SMEs in developing countries.

Originally, the establishment of BCM was strongly linked with crisis management, a business-centric concept with responsibilities at all levels of the organisation (Elliott et al.,2010). From the original mind-set which focused on computer technology, BCM evolved and was adopted in all

aspects of the organisation, but by the 1990s it had developed into a value-based mind-set which focused on maintaining the competitive advantages of the entire organisation, including human and social issues. The evolution of BCM is explained in more detail in Table 2, as proposed by Camastral (2014).

Table 2: Evolution of BCM

Emerged during this decade	Mind-set	Scope	Triggers	Process
1970s	Technology	Limited to technology Focus upon large corporate systems	External physical triggers, flood, fire, bomb	Contingency measures focused on hard systems
1980s	Auditing	All facilities All systems – both corporate and departmental offices	As above and legal or regulatory pressures	Contingency measures outsourced Compliance driven
1990s	Value-based	Maintain competitive advantage Includes customers and suppliers Entire organisation, including human, social issues	Organisational stake-holders in value system	BCM developed as business process focused on business managers

Source: developed by Camastral (2014)

Since the introduction in 2012 of ISO 22301, many studies (Bajgoric, 2014; Herbane, 2013b; Torabi, Rezaei Soufi, & Sahebjamnia, 2014) have adopted its definition of BCM, as a holistic management process that identifies potential threats to an organisation and the impacts to business operations which those threats, if realised, might cause, and which provides a framework for building organisational resilience with the capability of an effective response that safeguards the

interests of its key stakeholders, reputation, brand and value-creating activities. Ee (2014) also uses the ISO definition to define BCM as he also claims that it is currently the best industry practice for business continuity.

In the government context, Manchester City Council on its website[4] states that business continuity is about understanding and managing risks to the everyday running of an organisation. It helps organisations to prepare for an emergency or disruption by planning different ways of working so that the organisation can continue to deliver its key functions.

On the other hand, the Business Continuity Institute (BCI) stated that business continuity is about building and improving resilience in business; it is about identifying key products and services and the most urgent activities that underpin them and then, once this analysis is complete, it is about devising plans and strategies that will enable the organisation to continue business operations and recover quickly and effectively from any type of disruption, whatever its size or cause. It gives a solid framework to lean on in times of crisis and provides stability and security. In fact, embedding business continuity into business is proven to bring business benefits. In this definition, there are three main components or activities for delivering a good BCM framework: identifying, planning and recovering.

As an academic, Speight (2011) defines BCM as "*a management process that identifies potential factors that threaten an organization and provides a framework for building resilience and the capability for an effective response*". The main elements in this definition are (1) BCM is a process to identify risks and threats; (2) implementation of BCM leads to the establishment of a framework

[4] http://www.manchester.gov.uk/info/200039/emergencies/6174/business_continuity_planning

for building resilience; and (3) BCM enhances effective response. These elements are also the main components in the definitions discussed previously.

All of the above definitions highlight the importance of BCM in building and improving business resilience against disruption and disaster. Therefore, in short, BCM can be defined as a "*management process of identifying the ability of an organisation to continue delivery of products or services at acceptable predefined levels following a disruptive incident.*"

BCM can protect a company from hazards and disruptions caused not only by natural hazards but also by man-made disasters such as terrorism, cybercrime, computer failure, riots and employee sabotage (Parape et al., 2013). Wedawatta and Ingirige (2012) suggest that business continuity/risk management strategies are very useful for SMEs in dealing with natural hazards such as flood. The implementation of BCM leads to the establishment of necessary frameworks which can help an organisation to define risks and threats to its assets and operations (Al Hour, 2012). In order to build a BCM plan for an organisation before disaster, it is important to assess the business vulnerability components.

To create resilient organisations, BCM requires three core elements. First, it requires that management and information systems are available (by back-up or arranging for substitute) to facilitate the continuity of core business (Davies & Walters, 1998; Duitch & Oppelt, 1997; Lister, 1996); second, it requires crisis management systems and mechanisms for managing the transition between routine and crisis operations (Paton, 1997; Shaw & Harrald, 2004); and third, Paton and Hill (2006) suggest that the organisation needs to design its competencies and systems to ensure continuity of functioning under the different crisis operating conditions required by a large-scale natural disaster.

In order to promote BCM to all government agencies in the United States, the Federal Emergency Management Agency (FEMA) introduced a framework known as the Continuity Program Management Cycle. In this framework, FEMA suggested four components to identify the continuity capability in an organisation: leadership, staff, facilities and communications.

According to FEMA, an organisation's resilience is directly related to the effectiveness of its continuity capability. Continuity capability is defined as its ability to perform its essential functions continuously. In order to achieve the organisational continuity capability, the four components stated in the previous paragraph play their roles, in turn built on the foundation of continuity planning and program management. The continuity program staff within an agency coordinate and oversee the development and implementation of continuity plans and supporting procedures.

A standardised continuity program management cycle ensures consistency across all organisations in achieving continuity capability. It establishes consistent performance metrics, prioritises implementation plans, disseminates best practices, and facilitates consistent cross-organisation continuity evaluations (Directive, 2008).

However, no particular study shows that FEMA's Continuity Program Management Cycle is suitable for building and improving the resilience of small businesses, especially in developing countries.

Gibb and Buchanan (2006) suggested a BCM framework of nine phases: program initiation, project initiation, risk analysis, selecting risk mitigation strategies, monitoring and control, implementation, testing, education and training, and review. However, from the explanations of

this framework, it might not be suitable for SMEs because implementation of this framework requires finance, expertise and operational capabilities, which may be hard to find.

Bajgoric (2014) proposed a BCM systemic framework for implementation. However, this framework emphasises the IT issue only by developing a systemic implementation of several continuous computing technologies that enhance business continuity.

Few studies show the implementation of BCM among small businesses in developing countries, so it is important to investigate first how BCM is practised by SMEs in developed countries. Therefore, the next section will assess the current application of BCM in developed as well as developing countries.

2.6.1 BCM best practice

As stated in the previous section, business continuity is a significance approach in mitigating the impacts of natural hazard to businesses. Therefore, governments, regulators and business owners are started to consider requirement of having appropriate business continuity in place. In conjunction to this purpose, a recognised benchmark of good practice in BCM was therefore needed and several national standards were analysed, including those from Australia, Singapore, the United Kingdom (UK) and the USA. As the result, the International Standard Organization (ISO) responded by developing ISO 22301:2012, Societal security – Business continuity management systems – Requirements. The standard is the result of significant global interest, cooperation and input (Tangen & Austin, 2012).

Development of ISO 22301 started in 2006 during an ISO workshop on "Emergency preparedness" was held in Florence, Italy. At the time, there was no single BCM standard used and many experts argued that their own national standard was best suited to be developed into an International

Standard. In order to solve this problem, the ISO invited all related stakeholders to gather and identify the similarities between the existing standard from various countries. As the result, in 2007, a guidance document for incident preparedness and continuity management called ISO/PAS 22399:2007 was published by the ISO (Sharp, 2008).

Then a committee was formed by the ISO and the committee was required to propose a management system standard with requirements and intended for certification. For that purpose, the committee gathered input from the national standards from various countries to develop the initial draft wordings and gradually refined to become a new document bringing together good practice from around the world. Significant input came from Australia, France, Germany, Japan, Republic of Korea, Singapore, Sweden, Thailand, the UK and the USA. Many others contributed to its development, showing the truly international interest and input involved (Sharp, 2008).

The ISO 22301 consists of 10 main clauses[5], starting with scope, normative references, and terms and definitions. Table 3 briefly explain the requirements for clauses in the ISO 22301 BCM Standard.

Based on the Table 3, there are many requirements to be done by an organization in order to adapt the concept of good practice in BCM. Although the ISO claimed that this standard is suitable to be implemented by all types of business, in reality, there are a few requirements listed in the Table 3 that are not suitable by SMEs in Malaysia due to lack of financial and expertise capacity. For example, Clause 7 stated that organization need to provide people with appropriate knowledge, skills and experience to contribute to the BCMS and respond to incidents. However, most of the

[5] https://www.iso.org

Table 3: ISO 22301 Standard's Requirements

Clause	Standard's requirements
Clause 4 – *Context of the organization*	- Understand the internal and external needs of the organization itself. - Set clear boundaries for the scope of the management system. - Understand the requirements of relevant parties including regulators, customers and staffs. - Understand the applicable legal and regulatory requirements. - Determine the scope of the business continuity management system (BCMS).
Clause 5 – *Leadership*	- The need for appropriate leadership of BCM. - Top management ensures appropriate resources are provided, establishes policy and appoints people to implement and maintain the BCMS.
Clause 6 – *Planning*	- Identify risks to the implementation of the management system and set clear objectives and criteria that can be used to measure its success.
Clause 7 – *Support*	- People with appropriate knowledge, skills and experience must be in place to contribute to the BCMS and respond to incidents. - All staff are aware of their own role in responding to incidents - Need for communication about the BCMS and preparedness to communicate after an incident (when normal channels may be disrupted).
Clause 8 – *Operations*	- Undertake business impact analysis to understand how its business is affected by disruption - Risk assessment to understand the risks to the business and develop the development of business continuity strategy. - Develop steps to avoid or reduce the likelihood and steps to be taken when incidents occur. - Balancing risk reduction and planning for all eventualities.
Clause 9 – *Evaluation*	- Select and measure itself against appropriate performance metrics. - Conduct internal audits and there is a requirement that management review the BCMS and act on these reviews.
Clause 10 – *Improvement*	- Improve the BCMS over time and ensure that corrective actions arising from audits, reviews, exercises and so on are addressed.

Source: ISO 22301 BCM Standard

SME owners in Malaysia have no knowledge, skills and experience in BCMS. Lack of financial capacity is a main barrier for them to hire people with these skills.

Clause 8 of the standard required the organization to undertake business impact analysis and this is another issue will be faced by SMEs in Malaysia if they wish to adapt ISO 22301 in their organization. Business impact analysis is an approach used in identifying potential risks that might disrupt the critical operations of an organization. This analysis requires finance, expertise and operational capabilities, which may be hard to find.by most of the SMEs owners in Malaysia.

Establishment of the ISO 22301 as a best practice in BCM is a great initiative done to improve competency of business organizations. However, it is hard to suit all types and size businesses because it requires expertise and in certain aspects, it requires capital investment from business owners.

2.6.2 Current application of BCM

BCM is common in most developed countries and, as already noted, all UK local government is required to provide small-business continuity guidelines in accordance with the 2004 Civil Contingencies Act 2004 (Fisher et al., 2015; Herbane, 2013a). Interestingly, not only the government sector but also private companies such as insurance and financial have played a significant role in developing BCM among SMEs in the UK (McGuinness & Marchand, 2014; Schneider, 2014). A similar situation can be seen in other countries in Europe. For example, in the UK, Germany and the Netherlands, flood coverage is listed under standard property insurance to indicate the involvement of insurance companies in assisting all businesses, including small ones, in flood-prone areas (Keskitalo, Vulturius, & Scholten, 2014). However, for developing countries such as Malaysia, flood coverage is extension coverage for which policyholders need to pay a high additional premium (Aliagha, Mar Iman, Ali, Kamaruddin, & Ali, 2015; Lee & Mohamad, 2014).

Active participation of the private sector is believed to be a significant factor in the annual increase of SMEs adopting BCM in the UK. Based on a study by AXA Insurance in 2011, only 35 percent of SMEs in the UK had implemented BCM in their business, but by 2012 the figure had increased to 41 percent, and is expected to increase every year (Allen, 2012).

Meanwhile, in Japan, in 2005 the government introduced two sets of Business Continuity Guidelines, one specifically for natural hazards, mainly earthquakes. Since then, the number of medium-sized companies formulating and completing a BCM framework increased three-fold within three years. However, the BCM framework did not spread to SMEs, and few were interested in it (Maruya, 2010). In 2009, the Japanese government required local authorities to provide a BCM framework or guidelines for SMEs in their territory, and this action was very useful for SMEs in recovering after the Great East Japan earthquake which hit the Tohuku district in 2011 (Kawaguchi, 2012).

In New Zealand, the government has introduced policies and guidelines to assist small business resilience. In 2008, it established the New Zealand Civil Defence and Emergency framework, to be adopted by all businesses including small businesses. As a result, after the Canterbury earthquake in 2010, implementation of this framework and other policies showed improved resilience among SMEs (Hatton, Seville, & Vargo, 2012), while according to Radford, Addison, and Ahmed (2013), the three aspects which most helped SMEs' resilience were: (1) the role of insurance companies, (2) disaster policies introduced by the government, and (3) training for SMEs' owners/managers.

However, this research will propose a BCM framework for SMEs in Malaysia. There are no established frameworks or guidelines from government or other groups to support BCM among SMEs. Implementation of BCM in developing countries has not only failed among SMEs, but Sim

Abdullah et al. (2015) propose that BCM also failed to be implemented by government agencies in Malaysia. This indicates that BCM is not an important management process among many parties in developing countries, public sector as well as small business. Furthermore, any research on BCM in Malaysia only focuses on (1) BCM implementation in large/multinational companies, and (2) BCM as an approach to deal with IT and computer threat. None has considered the implementation of BCM in SMEs, or BCM as an approach for disaster/crises management.

A similar situation can be seen in other developing countries. For example, BCM is also uncommon among SMEs and the public sector in Thailand, especially before the unprecedented flood of 2011 which hit Bangkok (Herbane, 2013; Perwaiz, 2015). Perwaiz (2015) states that more than half a million SMEs in Thailand were affected, because of the termination of production of multinational companies during and after the flood. After the 2011 flood, the government of Thailand started to study the significance of BCM to SMEs in Thailand. In line with this, Thailand developed the National Economic Sustainable Development Plan 2012-2016, which suggested developing a BCM as one of the measurers to enhance preparedness and response to disasters. In addition, the ISO 22301 Business Continuity Management Standard has been promoted by the Thai Industrial Standards Institute (Kato & Charoenrat, 2018). However, there are no further literatures to discuss the progress of these plans.

2.7 Summary of gap

Based on the literature discussed above, it is clear that natural disasters have many negative impacts on business: financial, human resources, operational and supply chains. Studies agreed that the impact of disasters is worse for SMEs than for multinational and large companies, because of their financial limitations and lack of expertise in mitigating disasters. In addition, given the nature of business and their dependence on others, their vulnerability to natural disasters is greater.

Financial and expertise barriers contribute not only to the vulnerability of SMEs, but also to their resilience. Many SMEs are not resilient to the impacts of natural hazards. Although a few studies suggest that SMEs are more resilient than other companies, others indicate that they face more difficulties in surviving natural hazards.

In addressing the resilience problem among SMEs, many authors propose the concept of BCM, which can reduce the severity of disasters and increase the level of resilience among SMEs.

However, BCM has been studied only in developed countries, where it was initially implemented in multinational and large companies and the public sector. Provision of BCM guidelines for SMEs by government agencies, and contribution to the implementation of BCM by private companies is increasing.

In developing countries, the restriction of BCM to the IT branches of multinational and large companies has already been highlighted. Little attention has been given to BCM as a disaster management approach.

Even though SMEs play a significant role in the economic success of developing countries, there is no BCM support for SMEs from either government, private companies or academic researchers.

This research aims to fill this gap by helping SMEs to become more disaster resilient and by proposing guidelines or a framework for them to use in dealing with disaster.

2.8 Conceptual framework

Following the review of existing literature, a conceptual framework was developed for this research, seeking to represent the theoretical basis for addressing the research problem.

2.8.1 Conceptual frameworks in PhD research

According to Miles and Huberman (1994), developing a conceptual framework is an iterative process. This means that once a researcher has developed the framework, the researcher needs to revisit it and make necessary amendments based on new information available. This is an important process because the proposed framework might provide the direction and focus for the research. This statement was supported by Easterby-Smith, Thorpe and Jackson (2012) who stated that a conceptual framework can be used as a guideline for the researchers and align the idea of researchers in various ways without restricting the idea. They also accepted that different researchers might come up with different conceptual representations for the same general topic, depending on their educational and cultural backgrounds and their research experience. In addition, Miles and Huberman (1994) also highlighted the focusing issues and bounding functions of a conceptual framework. Therefore, it is important to have a framework which represents how the individual researcher conceptualises his/her research, in order for the study to be developed productively.

2.8.2 Conceptual framework for the research

Based on the literature review, this research will propose an initial conceptual framework as illustrated in Figure 2. As stated by Gartner (1985), the main purpose of a conceptual framework is to provide a sense of direction and focus for the study; accordingly, this framework is proposed as a guide for this research and to ensure it focuses on answering the research questions and achieving the research aim and objectives.

The initial conceptual framework was developed purely based on the literature review. It can be divided into three main parts: external, internal and expected results.

Studies by Herbane (2013a), McGuinness and Marchand (2014), Schneider (2014) and Fisher et al. (2015) indicate that successful BCM requires involvement from all external parties and stakeholders: government, the private sector and NGOs. As stated before, the main problems for SMEs, especially in developing countries, are lack of finance and expertise. Maruya (2010) and Allen (2012) explained that government involvement increased the number of companies implementing BCM in the UK and Japan, but this conclusion cannot be applied directly to developing countries, because the main point of the research is to proposed a BCM framework for SME to make them disaster resilient.

Meanwhile, studies by Radford et al. (2013) and Keskitalo et al. (2014) focus on the roles of private companies, including NGOs, in supporting the business continuity of SMEs, for example through affordable insurance for disaster coverage and training for SMEs.

Based on the literature, this research concludes that these external parties or stakeholders are not involved directly in SMEs' business operations but can support and help the SMEs to increase their resilience through implementation of BCM.

Secondly, the internal process by which SMEs develop a BCM framework is based on the study by Gibb and Buchanan (2006). However, these authors proposed a BCM framework for information strategies/technologies, while this research aims to implement the framework within the broader context of SMEs.

The first step in developing a BCM framework for an SME is program initiation. In the context of SMEs this means that they should be clear about the purpose of the framework and make all the staff aware of it. The information includes the person who is responsible for running the business continuity plan, how it works and how it will be financed.

Once the program has been defined, the SME needs to identify the core business operations to be prioritised during and after a disaster. This is known as project initiation. In this step, the owner of the SME needs to compile information including the business strategy, information strategy, financial plan, policies and procedures, organisational structure, customer and stakeholder information and copies of important documents. This is very important to ensure the business can start its operations immediately after the disaster. Details of the company's infrastructure should also be held securely, for insurance claims.

The SME must next analyse risk exposure. Risk analysis can be divided into two main tasks: risk identification and risk evaluation. This involves identifying events, the causes of these events and calculating the consequences of these events. Many authors recommend Business Impact Analysis (BIA) for analysing risk, but it is unlikely to be implemented by most SMEs in developing countries because it needs highly skilled experts. For SMEs, it is useful to study past events which occurred to them, their competitors and their location. From these records, they may be able to develop a simple risk management matrix and a SWOT analysis to help them to identify their risks.

The fourth step is risk mitigation strategies: the SME selects which risks are to be avoided, which can be transferred to other parties such as insurance companies, which can be minimised and which can be absorbed. In order to identify the strategy to be used for each risk, the SME should refer to the risk management matrix developed in the previous step. For example, a risk with high frequency and impacts should be avoided while a risk with low frequency and impacts should be absorbed.

After selecting the appropriate risk mitigation strategies, the SME monitors and controls the strategies. For this purpose, effective communication and a command and control structure should be in place to ensure that the requirements of the plan are translated into action. Therefore, it is

important for the SME to ensure existing staff have been appropriately trained and that new staff are inducted into the relevant BCM procedures. The SME is also responsible for ensuring that procurement of technologies and services takes place in line with the requirements of the risk mitigation strategies.

The next step is implementation, which is concerned with putting in place any improvements to operating procedures, infrastructure, security and other important operating procedures which can help to transfer, minimise or absorb the risks. This step also deals with ongoing testing of any recovery plans once they have been made fully operational. Other activities include arranging insurance cover and ensuring that documentation about the BCM plan is up-to-date and accessible.

Testing of risk mitigation strategies and disaster recovery plans should be carried out both regularly and comprehensively to see whether the plans are still relevant and deliverable. Gibb and Buchanan (2006) proposed that this step be carried out at least every three months. This is to ensure the risk mitigation strategies selected are appropriate to the nature of business and all staff are ready and understand the BCM strategies.

The next step is education and training, to ensure that the benefits and objectives of the BCM strategy have been communicated throughout the SME and its objectives can be achieved. The SME needs to communicate with stakeholders regarding their roles and responsibilities during and after disasters, as well as training the staff.

The final step in the proposed framework is review. This step is important to ensure the BCM strategy is responsive to changes in business requirements. New processes, applications, technologies and personnel all bring new risks and requirements, and it is essential that the enterprise does not become complacent or fail to update its BCM procedures.

The final part of the proposed framework is the expected results. Lister (1996), Duitch and Oppelt (1997) and Davies and Walters (1998) believe that implementation of a BCM framework in a business entity ensures that management and information systems are available (by back-up or arranging for a substitute) to facilitate continuity of the core business. Secondly, it should ensure that crisis management systems and mechanisms for managing the transition between routine and crisis operations would be carried out (Paton, 1997; Shaw & Harrald, 2004) Thirdly, Paton and Hill (2006) suggest that the BCM framework requires an organisation to design competencies and systems to ensure continuity of functioning under the different crisis operating conditions required in a large-scale natural disaster.

Therefore, the implementation of the proposed framework is not the role of the SME alone, but it requires collaboration from external parties to achieve its objectives. If the objectives can be achieved, the SME will increase its resilience; Paton and Hill (2006), Elliott et al. (2010) and Sim Abdullah et al. (2015) agree that BCM makes the business more resilient by adapting to change, preparing for uncertainties and remaining in operation throughout adverse situations, thus adding value to the business.

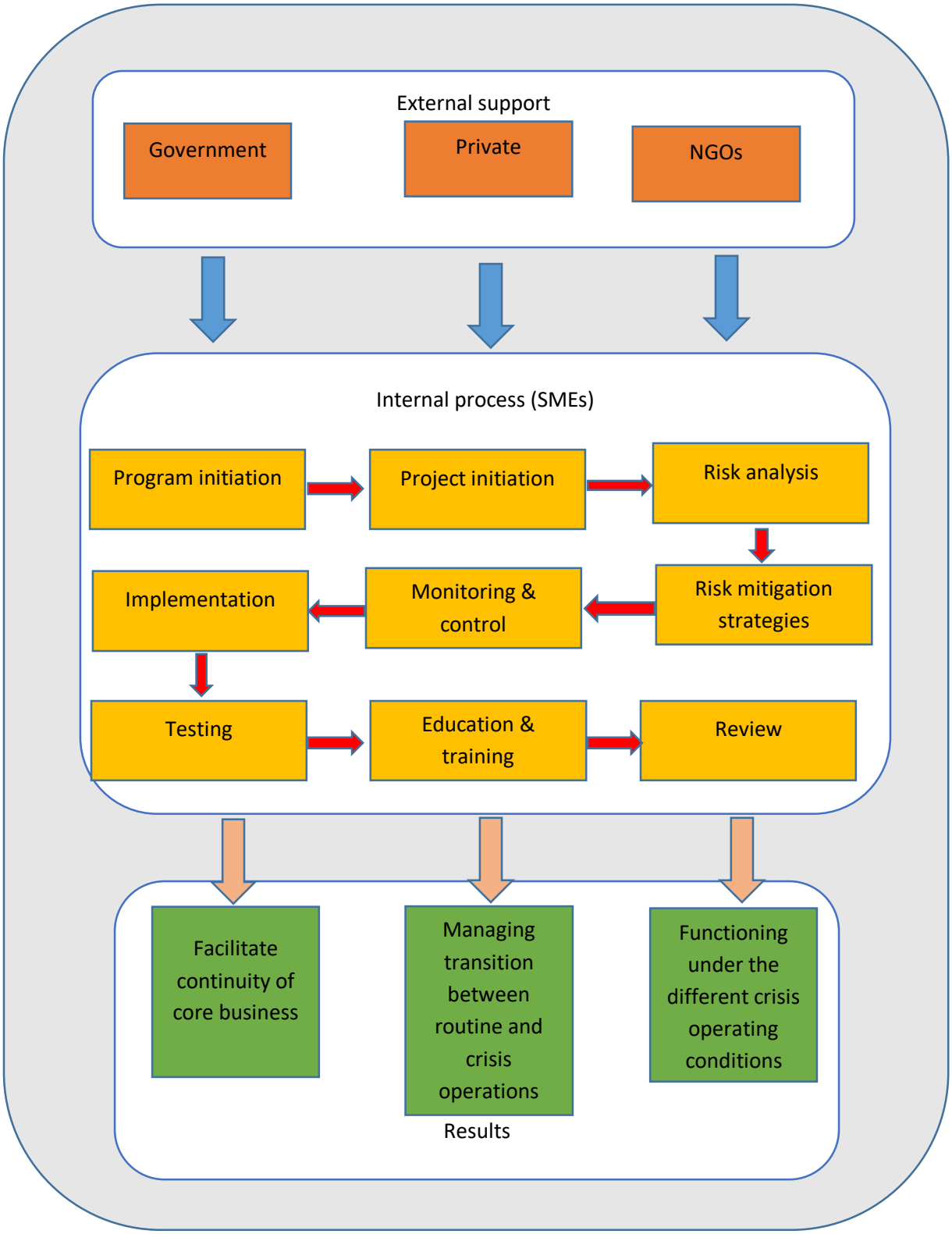

Figure 2: Proposed initial conceptual BCM framework for SMEs
Source: modified from Gibb & Buchanan (2006)

CHAPTER 3

REVIEWS OF CURRENT SITUATION IN MALAYSIA

3.1 Introduction

In the previous chapters, especially in Chapter 2, this research has explained a few related concepts used for this research including the concept of disaster and SME. However, all those concepts were discussed generally without being specified in any country.

Therefore, this chapter seeks to discuss similar concepts but in different perspectives, and will discuss how these concepts would be used or implemented in the Malaysia perspective. Furthermore, this chapter also discusses the practices of disaster management in Malaysia and related regulations.

Finally, this chapter will be used in order to partly achieve Research Objective 1 (RO1) and Research Objective 2 (RO2) of this research. The RO1 of this research is "*Examine the impact of natural hazards on SMEs in Malaysia*" while the RO2 is "*Assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs to reduce the impact of natural hazards in Malaysia*."

3.2 Malaysia: At a Glance

Malaysia is a small-sized country located in Southeast Asia. Generally, Malaysia is divided into two main parts: peninsular Malaysia which consists of 12 states (including Kuala Lumpur) and Borneo Island which consists of two states. This country is surrounded by ocean (except the north Peninsular Malaysia which links to Thailand and southern parts of Borneo's states which connect to Indonesia), mostly the Strait of Malacca and South China Sea. It has a tropical climate with warm weather all year round. Malaysia is geographically located outside the Pacific Ring of Fire,

so is free from catastrophe such as volcano and earthquake. However, due to its climate and weather, Malaysia is exposed to other natural hazards, such as floods, storms, landslides and tsunami. In addition, Malaysia has been hit by haze which comes from neighbouring countries and, due to climate change, Malaysia has also been hit by heat waves (Chan, 2015).

In terms of economic perspective, Malaysia is categorised by the World Bank as an upper-middle-income country which emerges as a multi sector economy. In this aspect, Malaysia aims to achieve high income status by 2020. In order to accelerate this aim, Malaysia continues to increase domestic demand and limit the country's dependence on exports, although they are still a significant part of their economy (Ong, 2013). The Five Year Malaysia Plan represents a planning document for Malaysian economic development. In May 2015, the Malaysian Prime Minister launched the 11th Malaysia Plan for the period of 2016–2020. It includes plans for improvement in agriculture and urban expansion as well as Disaster Risk Reduction (DRR) (Economic Planning Unit, 2015).

As stated before, Malaysia is exposed to various natural and man-made disasters. Therefore, in order to deal with these disasters, the National Security Council was established in February 1971. The main purpose of the National Security Council (NSC) is to coordinate disaster management in accordance with Directive No. 20, the "Policy and Mechanism on National Disaster Relief and Management" (Rahman, 2012). The Council facilitates activities that are implemented by the Disaster Management and Relief Committee, which comprises various agencies at federal, state and local levels. This committee is given the task of coordinating disaster relief operations at national, state and district level with the combined aims of reducing damage and reducing loss of human life due to disasters, including natural and man-made (Aini, Fakhru'l-Razi, & Daud, 2001). The details of the establishment of the NSC and Directive No. 20 will be discussed later.

In 2015, as reported by The Star, Malaysia is setting up a new National Disaster Management Agency (NADMA), which falls under the Prime Minister's department. The changeover is still in progress. However, this agency will perform the similar function as NSC in disaster management affairs. Impacts of this change is the new legislation on disaster management in Malaysia which will be introduced by the new agency.

Disaster management aspect is not only lead by the government involvement domestically but also at international level. It has consistently been a focus of Malaysia's development policy. In 2013, the Malaysia's National Platform for DRR was formalised, which involved various stakeholders from the whole of government, as well as the private sector. This is evident by the amount of resources provided to minimise risk factors and facilitate sustainable development (Izumi & Shaw, 2015). In addition, the 11th Malaysia Plan (2016-2020) focuses on strengthening disaster risk management across five phases (prevention, mitigation, preparedness, response and recovery). Based on the recent recognition of DRR locally including the Malaysia Plan and establishment of the new National Disaster Management Agency, Malaysia continues to develop disaster management structures and policies to meet the disaster risks and, in addition, to increasing the evolving role as leader of Humanitarian Assistance and Disaster Relief (HADR) in the region (Economic Planning Unit, 2015).

Internationally, Malaysia is one of the 187 countries that adapted the framework proposed by the Hyogo Framework for Action 2005-2015 and the Sendai Framework for Disaster Risk Reduction 2015. However, Malaysia is still in the phase of restructuring and reorganising the National Disaster Management Mechanism to fit in the HFA (Aini, Fakhru'l-Razi, Daud, Adam, & Kadir, 2007). In 2005, Malaysia had begun to adopt the HFA in the National Disaster and Fund

Management Committee Meeting, chaired by the Deputy Prime Minister. The committee meetings were held as a result of the ASEAN Agreement on Disaster Management and Emergency Response (AADMER-input HFA) in July 2005 in Laos. In addition, Malaysia was also one of 171 countries which agreed to adopt the Habitat Agenda during the Habitat II meeting that was held in Istanbul in 1996 (Habitat, 1996). According to the Habitat Agenda, it is essential for a country to evaluate the impact of policies, strategies and actions on the provision of adequate shelter and the achievement of sustainable human settlements development. As a result, Malaysia is now in the phase of enhancing the coordination of responsibility between the government bodies in terms of disaster management mechanism (Roosli, 2010). The Habitat Agenda also one of the features adapted to Malaysian standard operating procedure in disaster management as stated in the main national disaster management policy and guideline, the MNSC Directive 20 (Aini et al., 2007). The preventive measures have been taken through the establishment of authorities to set major hazard control regulations, enforcing the regulations, assessing the safety reports and emergency plans, conducting audits and accident investigations (Shaluf, Ahmadun, & Mat Said, 2003).

In line with the Habitat Agenda, the main responsibility of coordination between government bodies has been created by the government in 2015. In the transformation process, the National Disaster Management Agency took over the role of Disaster Management Division of the National Security Council (NSC), together with the Civil Defense Department (CDD), to be drafted into the fold as the main coordinating agency. The purpose of this amendment is to improve coordination during disasters and improve the service delivery of the government agencies during and after disasters.

As stated before, disaster management is one area which gets significant attention from the Malaysian government. In order to comply with domestic and international requirements and

policies, many disaster management activities have been done, doing and plan to do. Before this research discusses details of disaster management activities in Malaysia, it is important for this research to discover the impacts of disaster in Malaysia.

3.3 Disaster in Malaysia

In the last 40 years, Malaysia has experienced many disasters including natural and man-made disasters. According to EM-DAT, 55 natural disasters which killed 785 people occurred during the time period. The worst natural disaster occurring in Malaysia was Tropical Storm Greg which struck Eastern Malaysia State, Sabah, on 26th December 1996, where 270 deaths were recorded by the Malaysian Government. On 26th December 2004, once again Malaysia was shocked by the Indian Ocean Tsunami and this time 80 deaths were recorded. These two natural disasters are the worst ever natural disasters occurring in Malaysia to date but according to EM-DAT, flood is the main natural disaster in Malaysia because it happens every year (Guha-Sapir et al). The worst flood, recorded in 2014, hit Kelantan and other east coast states, killing 21 people and affecting at least 200,000 people with more than 60,000 of them evacuated. Ismail (2003) suggests that heavy rain (primary disaster) causing floods and landslides (secondary disaster) dominated most of those natural disasters. Besides natural factors, human factors such as poorly controlled land use, design of buildings, maintenance of equipment and machinery, and attitudes of personnel in regulatory compliance all inevitably added to the potential of the disaster (secondary disaster) (Ishak, Azizi, & Mohamed, 2004).

According to the UNISDR, the impacts of natural hazards in Malaysia caused economic damages of USD$138 billion in 2012 and that amount was more than 45 percent of the national GDP of the year. In order to finance the huge losses that result from natural disasters, many initiatives have

been introduced and developed by the government. Table 4 shows the damages due to natural hazards in Malaysia for the last 30 years.

Table 4: Impacts of natural hazards in Malaysia 1985 - 2015

Disaster type	No. of occurrence	Total deaths	Total affected	Economic damage ($US '000)
Drought	2	0	2,205,000	0
Earthquake *	2	104	5,073	500,000
Flood	39	239	906,983	1,296,500
Landslide	5	168	291	0
Storm	3	274	6,446	53,000
Wildfire	4	0	3,000	302,000

Source: D. Guha-Sapir, R. Below, Ph. Hoyois - EM-DAT: International Disaster Database – www.emdat.be – Université Catholique de Louvain – Brussels – Belgium
* including 2004 the Indian Ocean Tsunami

In the Tenth Malaysia Plan 2011-2015 announced by the Prime Minister in 10 June 2010, the government agreed to allocate USD$1.7 billion (RM5 billion) for disaster mitigation programs. The purpose of this allocation was to deal with the flood mitigation programs, forecasting and warning facilities as well as the development of disaster preparedness and community awareness programs and flood hazard maps (Malaysian HFA Progress Report 2011-2013). However, this amount was lower compared to the disaster mitigation allocation in the Ninth Malaysia Plan 2006-2010 where USD$2 billion (RM6 billion) was allocated. This reduction might be due to the economic situation in recent years intensifying competing financial requirements for different agendas.

Since the launching of the Ninth Malaysia Plan in 2005, disaster prevention and mitigation has become priority for the government of Malaysia (Siwar, Alam, Murad, & Al-Amin, 2009). A lot of programs and plans have been conducted in order to assess and mitigate risks of different disasters. The programs include the Road Platform Rise Up Study by the Public Works Department to identify and access flood risks for flood prone areas in the whole country. The

Climate Change Risk and Impacts Studies by the Malaysian Meteorological Department and Drainage and Irrigation Department provide insight on the level of exposure to hydro-meteorological hazards (Zou & Wei, 2010).

Other than that, through the National Slope Master Plan Study, the Public Works Department is responsible for establishing inventories and facilities for vulnerable areas to deal with different types of landslides hazards and risks (Gue & Wong, 2009; Jamaludin & Ali, 2013). Its Guidelines for Slopes has been widely used by government agencies and the private sector to minimise risks in slope failure disasters. The risk assessment of earthquake and tsunami on Malaysia had been completed and regularly updated to provide input to the response plan.

The National Hydraulic Research Institute and Malaysian Meteorological Department has carried out research on the local modelling global climate models to project future climate conditions. Results of the modelling provided inputs for assessing potential implications to several key resource and economic sectors in the country (Wahab, 2012). Meanwhile, the Drainage and Irrigation Department has conducted the National Coastal Vulnerability Index Study to assess vulnerability of coastal areas to sea level rise (Radzi & Ismail, 2012; Stanley & Lewis III, 2011). The Department of Town and Country Planning has developed some planning tools that aim to reduce risks of different disasters. These tools include the Land Use Planning Appraisal for Risk (LUPAR) Programme, Highland Planning Guideline and the concept of Environmentally Sensitive Areas for the preparation of national physical, state structure and local plans (Komoo, Aziz, & Sian, 2011).

There are also a number of R&D initiatives on risk assessment funded by the Science-Fund managed by the Ministry of Science, Technology and Innovation covering issues on flood, landslides and earthquakes. Research institutes or centres at national level or universities also

carry out multi-hazard assessment and research. For example, Southeast Asia Disaster Prevention Research Institute, Universiti Kebangsaan Malaysia, SEADPRI-UKM, conducts holistic and multi-hazard integrated research on disasters such as geological, climatic, technological hazard, while Centre for Natural Disasters Studies, Universiti Malaysia Sabah, acts as focal point for all research activities in the university that are related to natural disasters, their mechanism, impacts and mitigation of natural hazards towards the reduction of natural disasters in Malaysia (Wahab, 2012).

Besides the programs introduced, the Malaysian government has also introduced a few acts and regulations to govern disaster mitigation in Malaysia. The establishment of the Malaysia National Security Council was the turning point for the serious attention given by the government in this issue. The related acts and regulation and also the government agencies involved will be accessed in the following section.

3.4 Disaster management

Historically, the May 13 Incident (13 May 1969 racial riots) in Kuala Lumpur involving mainly Muslim Malays and non-Muslim Chinese, was the main event that resulted in the establishment of the National Operation Council (*Majlis Gerakan Negara*-MAGERAN/NOC) on 16 May 1969. The main purpose of this body was to restore and implement law and order by establishing an unarmed 'Vigilante Corps', a protective army and battalions of police force. Because of the 13 May Incident, the government also declared a national emergency state and suspended Parliament until 1971. When peace was restored, NOC (MAGERAN) was suspended and it was replaced by the National Security Council (*Majlis Keselamatan Negara*), which was officially established on 23 February 1971 to strengthen public security and national defence and to maintain public order in the country (Aini, Fakhru'l-Razi, Daud, Adam, & Abdul Kadir, 2005). However, the major

transformation in the Malaysia Disaster Management came more than 20 years later after the tragedy of the luxury condominium of Highland Towers collapsing on 11 December 1993. In the disaster, explanation given by various parties on the causes of the disaster differed greatly. At first, no agency admitted to taking responsibility for carelessness and negligence. In addition, many issues arose during and after the disaster such as lack of local expertise in specialised rescue operations, improper planning of disaster management, and lack of standardised rules and regulations. As a result, the government reviewed the existing provisions for disaster management and instituted a new mechanism for disaster relief and management (Aini et al., 2005). These issues also affected the government's reputation internationally because there was no pre-agreed emergency response plan when response teams from Japan, France and Singapore came to offer their assistance (Aini, et al., 2001). The Highland Towers' tragedy set an exemplar and reference for future disasters management because after the tragedy, the 'Policy and Mechanism on National Disaster and Relief Management' was formulated by the National Security Council in May 1994 to coordinate all emergency agencies and handle relief activities during any major on-land disaster incident (Aini, Fakhru'l-Razi, et al., 2001). In 1995, the MKN office was reorganised and renamed as the National Security Division (NSD) (*Bahagian Keselamatan Negara*-BKN) but on 24 July 1997, BKN was again renamed as the National Security Council (NSC) (*Majlis Keselamatan Negara*-MKN).

Meanwhile, the NSD has set up the 'National Disaster Relief Fund' as a disaster relief fund for the Malaysian government. Beside the establishment of the fund, there are continued efforts by respective agencies (government's machinery) in risk reduction. Based on the NSC website, risk reduction programs currently implemented by the Malaysian government include: developing an early warning system; establishing the National Disaster Information Centre; mitigation measures;

forming the National Disaster Management Council; detection and monitoring; ground survey and monitoring system; and ground receiving station.

The establishment of National Disaster and Information Management (NADDI) by the Malaysian Centre of Remote Sensing (MACRES), 'National Tsunami Early Warning System' was commissioned by the 'Malaysian Meteorological Department', the 'Storm water Management and Road Tunnel' (SMART) that was developed by the Malaysian Drainage and Irrigation Department (DID) are just some of examples in risk reduction and mitigation efforts made by government agencies. Several local universities initiated research centres related to landslide hazards in Malaysia such as the 'National Soil Erosion Research Centre' (NASEC) by the 'University of Technology Mara' (UiTM) and the 'Mountainous Terrain Development Research Centre' (MTD-RC) by the 'Putra University of Malaysia' (UPM) funded by the MTD Capital Berhad (Jaapar, 2006).

The establishment of those programs and projects is very significant for whole country. However, as stated by Huq et al. (2004), Göhl (2008), and Smith (2013), it is often the poor who are most vulnerable to risk and who have a lower capacity to survive and to recover during and after disasters. In the business perspective, normally small sized businesses are the most affected entity due to natural hazards. In addition, none of the disaster related programs as stated before was drafted specifically for SMEs despite their significant contribution to the country. This problem will be discussed in the next section which will focus on SME in Malaysia and the impacts of natural hazards on SME in Malaysia.

3.5 SME in Malaysia

As per discussion in Chapter 1 and Chapter 2 of this research, SMEs play an important role in the economy of most countries, crucial in terms of social inclusion, local employment and innovation

(Clemo, 2008; Falkner & Hiebl, 2015). SME International Malaysia (2013) stated that some advanced nations have succeeded because SMEs form a fundamental part of their economies, comprising over 98 percent of total establishments and contributing to over 65 percent of employment as well as over 50 percent of GDP.

These SMEs not only create income for households and families, but they also generate economic benefit for local people by providing jobs and supply-chain opportunities (Sievers & Vandenberg, 2007). In addition, they usually have a simpler organisation and thus are more flexible and faster in responding to changes around them (Lopez & Hiebl, 2014). Flexibility is also important for SMEs in responding quickly to customers' demands (Kayanula & Quartey, 2000).

What is more important, the existence of SMEs can contribute to increasing income from taxation, for enabling governments in the long run to invest in, for example, healthcare and education. Therefore, SMEs are viewed as a significant element of a healthy and growing economy. They are believed to provide an energy not only for the developed countries, but also for developing and the least developed countries.

Malaysia is one of the countries that depends significantly on SMEs for its economic growth. A recent report showed that SMEs contributed 32 percent of the country's GDP, employed 59 percent of the nation's workforce and contributed19 percent of its exports (National SME Development Council, 2013). This contribution to the Malaysian GDP is expected to grow further, up to 41 percent by 2020 (Khan & Khalique, 2014).

SME in Malaysia is governed by the SME Corporation Malaysia (SMECorp), an agency under the Ministry of International Trade and Industry (MITI) which was established on 2 May 1996. The main roles of the SME Corp are as a central coordinating agency that formulates overall policies

and strategies for SME and coordinates the implementation of SME development programs across all related Ministries and Agencies in Malaysia. It acts as the central point of reference for research and data dissemination on SMEs, as well as providing advisory services for SMEs in Malaysia.

Due to the Malaysian economic stability in 2013 and 2014, SMEs performed very well during those years. SMEs benefited from continued strength of local private demand and, consequently, the contribution of SMEs to overall Gross Domestic Product (GDP) increased significantly to 35.9 percent in 2014. For 2015, SMEs were expected to continue to expand by 5.5 percent in line with trends in the global and domestic economy. Table 5 shows the comparison of SME contribution to the Malaysian GDP in 2010 and 2014 based on sectors.

Table 5: SME contribution to the Malaysian GDP in 2010 and 2014

	SME Contribution to GDP		
	2010 (% share)	2014 (% share)	Increase/decrease in share (%)
Construction	0.9	2.0	1.1
Services	19.6	21.1	1.5
Mining and quarrying	0.0	0.1	0.1
Agriculture	4.3	4.5	0.2
Manufacturing	7.2	7.8	0.6
Overall	**32.2**	**35.9**	**3.7**

Source: The SMECorp Annual Report 2015

3.6 Impacts of natural hazards to SME in Malaysia

As stated in Chapter 2, the impacts of natural hazards to SME is very bad, especially those in developing and least developed countries. Due to their size and financial limitations, SMEs are especially vulnerable to disasters. Falkner and Hiebl (2015), for example, suggested that SMEs are exposed to both natural and man-made disasters, mainly because of lack of financial expertise, but also geographical location. The Asian Disaster Reduction Center (ADRC) in 2012 found that

SMEs in Asian-Pacific countries, for example, are threatened by at least 14 disasters a year, including earthquakes, floods, hurricanes, pandemics, terrorism and nuclear accidents.

SMEs in Malaysia are also exposed to various natural hazards that lead to higher vulnerability. In the 2015 flood that hit Kelantan and other east coast states, at least 13,337 SMEs were affected and this figure represents 37.7 percent of all SMEs in Kelantan state. However, the main issue is not the number of the affected businesses, but more importantly how many of these businesses were able to continue their business immediately or within a few months after the disasters. Although there is no specific number recorded by any agency, based on the interview with the SMECorp, less than 5 percent of the affected SMEs in Kelantan were able to continue their operation within six months after the flood.

Therefore, it is essential to assess the factors that contributed to this problem. The Symantec SME Disaster Preparedness Survey for Malaysia in 2012 suggested that more than 73 percent of SMEs in Malaysia were not prepared for any natural hazard. The survey also revealed that only 14 percent of respondents (SMEs in Malaysia) have an actual disaster recovery plan in place for implementation, while less than one third of the respondents have a secondary location where a mirror copy of information and data can be backed up.

The result of the Symantec SME Disaster Preparedness Survey is in line with the result for survey of this research. In the survey conducted for this research, many SMEs agreed that they are not prepared for disaster by not taking any coping strategies to avoid losses to their business. The details of the survey findings will be presented in Chapter 6.

3.7 Roles of External Parties in DRR in Malaysia

The main focus of this research is to develop a BCM framework that can be used to improve the disaster resilience of Malaysian SMEs. However, this research is also emphasises to other related parties as discussed in Section 2.4. Studies by Herbane (2013a), McGuinness and Marchand (2014), Schneider (2014) and Fisher et al. (2015) indicate that successful BCM requires involvement from all external parties and stakeholders such as government sector, private sector and NGOs. As stated before, the main problems with SMEs, especially in developing countries, are lack of financial and expertise capabilities. Maruya (2010) and Allen (2012) explain the significance of government involvement which would increase the number of companies implementing BCM in the UK and Japan. As the studies were done in developed countries, it is not possible to be applied in developing countries because the main point of the studies is the need for government to provide SMEs framework to guide SMEs during and after disasters.

Meanwhile, studies by Radford et al. (2013) and Keskitalo et al. (2014) are focusing the roles of private companies, including NGOs, to support business continuity of SMEs. Among supports that can be provided by private companies and NGOs are affordable insurance for disaster coverage and training for SMEs.

Based on these literatures, this research categorised all these parties as external parties or stakeholders, those not involved directly in the SME's business operations, but who can support and help the SMEs increase their resilience through implementation of BCM. Therefore, this section will discuss the roles of each external party in the Malaysia context. In addition, this section will discover the existing DRR programs imposed by these stakeholders.

3.7.1 Roles of the government

Expectations of the public and media on pre, during and post disasters require action by the central government. Scholars have found that there are four reasons why researchers have focused on the government's response to the disaster management:

1. Government is responsible for implementing government policies (Perry & Lindell, 2003).
2. Government is the most trusted body elected by the people (Herman, 1982).
3. The third is the transition of power from the federal to local government (May, 1985).
4. The comprehensive plans of disaster management make it easy for all parties to cooperate with the federal, state and local agencies (Cigler, 1986).

A similar situation can be seen in Malaysia. The public expects the central government to perform necessary actions during the occurrence of natural hazards. In Malaysia, government is divided into three levels: federal, state and local government. Each level has its own responsibilities in mitigating disasters as stated in the NSC Directive No 20 which is explained in Section 3.4. However, federal government plays the most significant role, including declaration of emergency and major disasters status, drafting and implementing disaster management policies, as the source of funding, activating the federal response plan and emergency support functions by agencies at federal level.

In the Tenth Malaysia Plan 2011-2015 announced by the Prime Minister in 10 June 2010, the government agreed to allocate USD$1.7 billion (RM5 billion) for disaster mitigation programs. The purposes of this allocation are to deal with the flood mitigation programs, forecasting and warning facilities as well as the development of disaster preparedness and community awareness programs and flood hazard maps (Malaysian HFA Progress Report 2011-2013). However, this amount was lower compared to the disaster mitigation allocation in the Ninth Malaysia Plan 2006-

2010 where USD$2 billion (RM6 billion) was allocated. This reduction might be due to the economic situation in recent years intensifying competing financial requirements for different agendas.

Since the launching of the Ninth Malaysia Plan in 2005, disaster prevention and mitigation has become priority for the government of Malaysia (Siwar et al., 2009). A lot of programs and plans have been conducted in order to access and mitigate risks of different disasters. The programs include the Road Platform Rise Up Study by the Public Works Department to identify and access flood risks for flood prone areas in the whole country. The Climate Change Risk and Impacts Studies by the Malaysian Meteorological Department and Drainage and Irrigation Department provide insight on the level of exposure to hydro-meteorological hazards (Zou & Wei, 2010).

Other than that, through the National Slope Master Plan Study, the Public Works Department is responsible for establishing inventories and facilities for vulnerable areas to deal with different types of landslides hazards and risks (Gue & Wong, 2009; Jamaludin & Ali, 2013). Its Guidelines for Slopes has been widely used by government agencies and the private sector to minimise risks in slope failure disasters. The risk assessment of earthquake and tsunami on Malaysia has been completed and regularly updated to provide input to the response plan.

The National Hydraulic Research Institute and Malaysian Meteorological Department has carried out research on the local modelling global climate models to project future climate conditions. Results of the modelling provided inputs for assessing potential implications to several key resource and economic sectors in the country (Wahab, 2012). Meanwhile, the Drainage and Irrigation Department has conducted the National Coastal Vulnerability Index Study to assess vulnerability of coastal areas to sea level rise (Radzi & Ismail, 2012; Stanley & Lewis III, 2011). The Department of Town and Country Planning has developed some planning tools that aim to

reduce risks of different disasters. These tools include the Land Use Planning Appraisal for Risk (LUPAR) Programme, Highland Planning Guideline and the concept of Environmentally Sensitive Areas for the preparation of national physical, state structure and local plans (Komoo et al., 2011).

There are also a number of R&D initiatives on risk assessment funded by the Science-Fund managed by the Ministry of Science, Technology and Innovation covering issues on flood, landslides and earthquakes. Research institutes or centres at national level or universities also carry out multi-hazard assessment and research. For example, Southeast Asia Disaster Prevention Research Institute, Universiti Kebangsaan Malaysia, SEADPRI-UKM, conducts holistic and multi-hazard integrated research on disasters such as geological, climatic, technological hazard while Centre for Natural Disasters Studies, Universiti Malaysia Sabah, acts as focal point for all research activities in the university that are related to natural disasters, their mechanism, impacts and mitigation of natural hazards towards the reduction of natural disasters in Malaysia (Wahab, 2012).

Although there were a lot of programs implemented, most of the programs are emphasised at the national level. Most programs are handled and conducted by the government agencies at national level. How about agencies at local levels and what are the roles of local governments in these disaster mitigation programs?

The risk assessment needs to be carried out at local level by local authorities because they know better the vulnerability areas compared to the central government agencies (Kusumasari, Alam, & Siddiqui, 2010a). Such efforts will require more effective dissemination of existing information and resources in order to support such assessments. However, it is crucial to take into consideration different priorities and needs of various stakeholders in a balanced manner under the current situation of limited resources.

Implementation of many disaster mitigation programs is not guaranteeing the success of the overall disaster mitigation programs in a particular country. Despite the many flood mitigation programs conducted in the Ninth and Tenth Malaysia Plan, flooding is still the main disaster in Malaysia and it occurs in the same states and areas every year. Its increased frequency and magnitude has caused the country substantial financial losses and the losses are expected to increase every year (Lee & Mohamad, 2014).

There are a few issues and challenges that need to be tackled by the government of Malaysia in order to strengthen its disaster mitigation programs. Among the issues and challenges are the mainstream disaster risks reduction in policy implementation, planning and development. It is important to incorporate disaster prevention and mitigation elements in all projects and development plans. It will provide a safer environment and reduce people's vulnerability and at the same time it might encourage many agencies and bodies to become involved in disaster risk reduction activities. On the government side, implementation of disaster risk reduction activities in national development plan and national budget will help reduce the disaster impact but all the activities should be monitored and reviewed to make sure they achieve their objectives and comply with international standards and requirements (Göhl, 2008).

The second challenge facing by the government is to strengthen disaster management framework in local governments. As stated before, local governments in Malaysia are not playing significant roles in disaster management. Different situations can be seen in developed countries such as the United States and Australia, where roles of local governments in disaster mitigation programs are highly recognised. To deal with this problem, existing policies should be revised and the government should conduct more activities that could enhance inter agency co-operation,

especially those involving local governments and communities in order to create community based disaster management (Ghosh & Kamath, 2012; Göhl, 2008; Kusumasari et al., 2010a).

Involvement of non-government sectors is also another challenge which should be tackled by the government. Not many private corporations and NGOs are willing to participate in disaster mitigation programs in Malaysia. However, public private partnership (PPP) would help the government to cope with resources including finance and human resources. Enhancing corporate social responsibilities (CSR) activities and strengthening enforcement of bylaws are also actions which can be taken to gain more involvement of non-government organisations for disaster mitigation programs (Wahab, 2012).

Awareness is another important challenge which should be highlighted by the government. The government must take necessary actions to increase public awareness, education and public participation in disaster management. Awareness programs should be incorporated in school curricula as well as in tertiary education. Currently, there are a few safety programs run in schools but the programs are optional and not incorporated in the education curriculum. Otherwise, there are no safety programs on natural disasters organised in schools.

The last challenge for the government is to enhance institutional capacity in preparedness of agencies in responding to disasters. Every year in newspaper and electronic media, people complain about the response of the government agencies toward disasters. Even when the same disaster occurred and the same communities were affected, response from government agencies was still the main issue here. Government should improve overall capacity and preparedness of response agencies especially in search and rescue activities. The response agencies must get sufficient training and skills to make them more prepared for any type of disaster. They also must be equipped with high tech equipment (Aini, Fakhru'l-Razi, & Daud, 2001).

Therefore, success of a disaster management mechanism is not only measured by central government policies but it depends on its implementation at the local level. Robust and resilient disaster management systems rely on the participation and collaboration of all parties (stakeholders) including the private sector, NGOs and the public. Lastly, the investment in disaster risk reduction could reduce the socio-economic impact of disasters on the affected communities.

3.7.2 Roles of private sector

Besides the government, many scholars agree that the private sector also plays a significant role in DRR programs in a country (Chatterjee & Shaw, 2015b; Izumi & Shaw, 2015; Johnson & Abe, 2015). Participation of the private sector in government projects such as disaster management is important in order to deliver better services to the community. In addition, the Hyogo Framework of Actions also highlighted this issue by addressing the need for multi stakeholders', including the private sector, involvement in disaster management (Izumi & Shaw, 2015).

The main role of private sectors is to accomplish any weakness on the government side (Busch & Givens, 2013). Usually, in disaster management, as discussed before, finance is one of the main issues facing the government. However, insufficient funds in disaster management programs can be reduced by participation of private actors, which has access funds. Involvement of the private sector will also assist government to formulate better programs, such as social insurance for disaster because the private companies can provide expertise in complicated matters and the private companies have the capability to operate these types of programs (Busch & Givens, 2013; Khan et al., 2013; Lassa, 2013).

On the other hand, Izumi and Shaw (2015) address five ways of private sector engagement in disaster management:

1. Direct assistance to communities (emergency distribution, search and rescue);
2. Disaster preparedness for own business (BCP/BCM, response and recovery plans);
3. Developing innovative products based on business, technology and expertise (insurance, communication, infrastructure);
4. Joint projects with NGOs, governments, and international organisations as implementer, not donor; and
5. Establishment of private foundations, NGOs and trusts.

In Malaysia, the private sector plays significant roles in DRR programs, especially financial institutions such as insurance companies. According to the website of the Central Bank of Malaysia[6], there are 33 licensed general insurance and *takaful* (Islamic insurance) operators in Malaysia currently. Based on an internet search, most of these companies provide coverage for natural disaster such as flood and earthquake but for personal customers, not for business. Only 18 percent of these companies offer products or coverage for SMEs. However, none of them covers SMEs for catastrophe and natural hazard risks. Their coverage is more for fire, burglary and mechanical breakdown.

Besides insurance companies, other financial institutions such as banks also play significant roles especially after disasters. Many banks such as SME Bank, Malaysian Development Bank and Agro Bank provide assistance in terms of soft loans to SMEs affected by natural hazard. In addition to their own soft loan, these banks also participate in the 'Special Relief Facility' programs under the Central Bank of Malaysia to provide financing for SMEs affected by natural hazards to rebuild their business for up to RM500,000[7].

[6] http://www.bnm.gov.my/index.php?ch=fs&pg=fs_mfs_list&ac=118&lang=en
[7] http://www.smebank.com.my/special-relief-facility/#content

On the other hand, there are other private companies in Malaysia participating in post disaster relief programs around the country. Their participation could be seen clearly during the Great Flood 2015 where many companies were involved in various programs to help victims of the disaster. For example, Maybank and Media Prima organise the *'Tabung Bantuan Banjir'* (Flood Assistance Fund) every time during and after flood as an initiative to assist flood victims. Meanwhile, during the Great Flood 2015, Jakel Trading, a textile and fashion company, allocated RM1 million in terms of food, drink and basic necessities to be distributed to the flood victims. Beside Jakel Trading, Aeon Corporation also contributed similar assistance during the flood (Joni, 2015).

Many of these private companies were involved in during and post disaster phases. Not many of them were interested to participate in the disaster preparedness and awareness. However, according to Izumi and Shaw (2015), there were two companies in Malaysia involved in disaster preparedness and awareness phase: Petronas and Tenaga Nasional Berhad.

3.7.3 Roles of non-government organisations (NGOs)

Besides the government and private sector, many previous studies agreed that NGOs also play significant roles in DRR. Haddow, Bullock and Coppola (2013) categorised NGOs into three types: international, national and local. International NGOs in the disaster management context include agencies under the United Nations such as the United Nations International Strategy for Disaster Reduction (UNISDR) and the Inter Agency Standing Committee (IASC), international financial organisations such as the World Bank and the International Monetary Fund (IMF), and also international development agencies such as the Asian Development Bank. In addition, international humanitarian agencies such as the Red Crescent Society and the Cooperative for

Assistance and Relief Everywhere (CARE) also play a significant role in disaster and emergency management worldwide.

However, the existence of these international organisations is rarely to be seen in Malaysia because most of the natural disasters in Malaysia are local and can be managed internally without intervention from these international organisations. In addition, the natural disasters in Malaysia do not result in humanitarian crises which might attract these organisations. Therefore, according to the Malaysia Disaster Management Reference Handbook 2016, only three international organisations related to DRR have their offices in Malaysia: International Federation of Red Cross and Red Crescent Societies (IFRC), International Committee of the Red Cross (ICRC) and United Nations Development Program (UNDP). However, in order to comply with international needs, the government of Malaysia still participates in DRR programs conducted by these international organisations such as the Hyogo Framework for Actions 2005–2015 and the Sendai Framework for the Disaster Risk Reduction 2015–2030.

Domestically, there are a few NGOs involved directly and indirectly with DRR programs. However, many of these NGOs actively participate in emergency and relief activities during and after disasters occur. Among NGOs is the Malaysian Red Crescent Society (MRCS) which places significant importance on DRR where it supports local civil society, communities, households and individuals to become less vulnerable and strengthens their capacity to anticipate, resist, cope and recover from natural hazards. MRCS also provides medical assistance services to the victims of natural disasters including ambulance and doctors at evacuations centres and also participates in search and rescue activities. The Aman Malaysia is another example of national NGO that is involved in disaster management in Malaysia. However, similar to MRCS, the involvement of the Aman Malaysia is mostly in the during and post disaster phases. Based on the recent events of

flood, the Aman Malaysia actively assisted the government agencies in distributing aid and providing basic support to the flood victims.

Although many local NGOs are actively involved in the post disaster activities, Izumi and Shaw (2012) identified MERCY Malaysia as an NGO that is involved not only in post disaster activities, but also in disaster preparedness and awareness programs in Malaysia. MERCY Malaysia or Medical Relief Society Malaysia, which formed in 1999, is a non-profit organisation focusing on providing medical relief, sustainable health related development and risk reduction activities for vulnerable communities in both crisis and non-crisis situations. MERCY Malaysia initiated their DRR programs in 2008, especially for school children and communities in flood prone areas. The programs focus on the involvement of the local government in those areas in flood preparedness and awareness. Besides local government, the programs also involve participation from local communities and private sectors.

Besides the NGOs mentioned above, there are many other local NGOs which participate in disaster relief and assistance activities. For example, in the Great Flood 2015, many NGOs were involved in the relief programs. According to the *Angkatan Belia Islam Malaysia* (ABIM), they coordinated 17 NGOs and charity bodies during the floods in helping government agencies distributing the assistance and support (ABIM, 2015). For the same event, 15 registered NGOs united to form *Gabungan Bantuan Banjir NGO* (GBBNGO), which has similar functions to ABIM but in different locations (Harakahdaily, 2015). In addition, there were many other NGOs involved in the flood but the exact number was not reported.

3.8 Case study

Based on the explanations in this chapter, Malaysia is a country that exposed to various natural hazards and has its own approach to mitigating the impacts of natural hazard. Definition of SMEs

in Malaysia also might different to other countries and the impacts on natural hazards to these SMEs also different. Therefore, this research focused on a single case which is Malaysia. The purpose of selecting one single country is to provide deep understanding on the issues carried out by this research. Further explanation about selecting case study will be presented in Section 4.2.4.2.

3.9 Summary and link

Data from various international bodies shows that the impacts of natural hazard are severe in Malaysia. Information from Section 3.3 indicated that natural disasters occur every year in Malaysia and cause a significant number of deaths and economic damage to the country. The data also show that flood is the main natural disaster in Malaysia, but there are also other disasters such as storms, landslides, haze and earthquake.

Besides individuals, SMEs are another party affected by natural hazards. Lack of financial and expertise capability are among the main problems reported in previous literatures.

Therefore, many actions have been taken by the government in order to cope with the impacts of natural hazards. One of them is implementing related policies, guidelines and disaster mitigation plans. The primary policy to be used for DRR in Malaysia is the NSC Directive No 20 which covers disaster management aspects from all levels: federal, state and local government. However, the function of the NSC Directive No 20 is more as a guideline to the coordination of the roles of related agencies during disasters, not as a preventative and preparedness step. Therefore, for the purpose of prevention and preparedness, several actions and projects have been introduced by the government including the SMART tunnel and other initiatives as announced in the 5 year Malaysian Plans.

In developed countries, the government, private sectors and NGOs play significant roles in DRR especially in preparedness aspects. However, the situation in Malaysia is different. Only government plays the major roles in DRR while the private sectors and NGOs only appear during and after the disasters for humanitarian activities. Although there are a few private sector and NGOs that conduct their own disaster awareness and preparedness programs, the effectiveness of the programs is yet to be proved.

Finally, as stated before, many studies agree that the impacts of natural hazard are severe to SMEs in Malaysia. This chapter has partly achieved Research Objectives 1 (RO1); examine the impacts of natural hazard on SMEs in Malaysia. Further investigation will be conducted in the next two chapters through the data from semi-structured interviews and a questionnaires survey. For Research Objectives 2 (RO2), it is clear that the government has played significant roles in supporting SMEs to reduce the impacts of natural hazard in Malaysia. Various programs managed by the government agencies such as the SMECorp and Central Bank of Malaysia are offered to SMEs. Private companies, especially financial institutions are also offered financial products to assist SMEs' recovery. However, the effectiveness of the roles played by private companies in helping SMEs still needs further investigation. Again, similar to the RO1, further study in the next two chapters will be used to fully achieve the RO2.

CHAPTER 4

RESEARCH METHODOLOGY AND PROCESS

4.1 Introduction

The methodology used for this research is discussed in this chapter. Overall, it is divided into three phases: (1) preliminary, (2) data collection, and (3) validity and reliability.

This research was started with the preliminary phase. In this phase, exploratory study through primary and secondary data was done. At the same time, the research philosophy, approach, strategy, time horizon and data collection methods were identified.

Analysis of literature reviews from previous research, government reports, newspapers and online resources was done in order to identify the research gap of this research and also to develop a conceptual framework. After the research gap had been identified, exploratory interviews were conducted in order to explore, understand and confirm the main research gap. Seven interviews were conducted and respondents for these interviews came from various backgrounds, including government agency, academia experts, professional experts and practitioners.

The second phase was the data collection phase. In this phase, data for this research were collected through analysis of secondary data and a survey. The purposes of the secondary data analysis are: (1) to examine the impacts of natural hazard to SMEs in order to achieve the Research Objective 1 (**RO1**) of this research; and (2) to assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs in reducing the impacts of natural hazard and this is useful in achieving the Research Objective 2 (**RO2**). The secondary data analysed here included government documents, previous research, newspaper reports and internet databases. Publications from international organisations were also useful in this phase.

A survey was conducted in this second phase. Respondents of this survey were SME owners and the purposes of this survey were: (1) to identify the SME's perception of existing DRR program; (2) to assess the key issues that affect disaster resilience; and (3) to get new input for the developed conceptual framework. This survey is also used to achieve the Research Objectives 3 and 4.

The final phase of this research is validity and reliability phase. In this phase, another interview session was conducted in order to validate the proposed conceptual framework. Respondents used for this interview came from the government agency used in the preliminary phase or were experts in the area of research. At the same time, a reliability test was conducted to check data consistency for the survey.

The research methodology process for this research is illustrated in Figure 3 and the detail of each phase will be explained later in this chapter.

4.2 Phase 1: Preliminary

The first phase of this research was to explore the main research problem by doing an exploratory study. Once the research problem had been identified and confirmed, an initial conceptual framework was developed. At the same time, the selection of the research philosophy, approach, time horizon and data collection methods were determined.

Phase 1: Preliminary
➢ Selection of research philosophy, approach, strategy, time horizon and data collection ➢ Analysis of literature review • To identify the research gap • To develop an initial conceptual framework ➢ Interview • To confirm, explore and understand the research gap
Phase 2: Data collection
➢ Analysis of secondary data • To examine the impacts of natural disaster to SMEs • To examine the roles of government agencies, private sectors and NGOs ➢ Survey • To identify the SME perception on existing DRR program • To assess the key issues that affect disaster resilience of SMEs • To get new input for the initial conceptual framework
Phase 3: Validity and reliability phase
➢ Interview • To validate the framework to get the final framework ➢ Data analysis • To analyse data from the expert interviews • To analyse data from the survey using the statistical package • To analyse data from the validation interviews ➢ Reliability test • To check survey data consistency

Figure 3: Research methodology process

4.2.1 Exploratory study

This research was started by penetrating the main problem to identify the research gap. The purpose of this step was to find out what is happening, to seek new insights and to assess the current phenomena. Saunders, Lewis and Thornhill (2009) agree that exploratory studies are important for researchers to clarify their understanding of a problem. The authors also suggest that

exploratory studies can be conducted by a search of the literature, interviewing experts in the subjects and conducting focus group interviews.

Exploratory study for this research was done by searching related literature including previous research, government documents and newspaper reports to identify the main research problem. Once the main research problem had been identified, interview sessions were conducted. The purpose of these interviews was to explore, understand and confirm the research gap identified through the literature search. Seven respondents from various backgrounds participated in the interviews. Some of the interviews were conducted face to face, some through phone calls and some through the Skype application. Brief profiles of the respondents will be presented in the nest sub-section (Section 4.2.2.1).

4.2.1.1 Respondents

Identifying a suitable respondent for an interview is essential in order to ensure the researcher acquires accurate data. For the purpose of this research, the respondents were selected from various backgrounds in order to acquire information from different perspectives and views. All the respondents in this research are experienced personnel in the research area including SMEs, BCM and disaster resilience. In addition, some respondents have experience of the research area in the Malaysia context and some of them in the UK context, therefore perspectives of implementation of BCM among SMEs in developing country and developed country can be obtained.

The first respondent (**R1**) is the Head of Unit in a government agency that handles and manages the SMEs' affairs in Malaysia. Currently, the **R1** is responsible for leading a unit that is directly involved in SMEs. Among the **R1** responsibilities are giving business advice to SMEs including legal requirement, financing facilities and business supports. Prior to that, **R1** worked in a

commercial bank in Malaysia and based on the banking background and experience, **R1** has a good knowledge of BCM.

The second respondent (**R2**) is the Deputy Director of a business development institute in one of the public universities in Malaysia. The **R2** is also a professor of entrepreneurship and expert for SMEs' development in Malaysia and has done much research in this area. **R2** has obtained several research grants from the government of Malaysia for research on SMEs.

The third respondent (**R3**) is an academician from a university in the United Kingdom which has a wealth of experience on this research topic. The respondent is also involved in a few projects relating to BCM in the United Kingdom. Part of that, **R3** is also involved in a few research projects in Malaysia; therefore, the **R3** has a good knowledge on Malaysia environments as well as the UK.

The fourth respondent (**R4**) is one of the key persons on BCM in Malaysia. The **R4** established and owned a consultancy firm in Malaysia which specialised in the area of crises management, risk management and business continuity. **R4** also obtained a few professional certifications in BCM and received awards from the Business Continuity Institute Malaysia (BCI) for initiative in promoting BCM in Malaysia. The respondent also has strong engagement with the Business Continuity Institute, United Kingdom, and has experience of more than 20 years in this area. Before establishing the consultancy firm, **R4** was the Vice President of the BCM Department in a commercial bank in Malaysia.

The fifth respondent (**R5**) is a researcher in a university in London. The respondent has over five years' experience in doing research in this area including on SMEs and their adaptation to climate change and hazards in London. In addition, the respondent is involved in a project under the British Council in Malaysia regarding flood management.

The sixth respondent (**R6**) is the Chief Procurement Officer of a government linked corporation (GLC) in Malaysia. **R6** is also one of the office bearers of the Malaysian Association of Risk and Insurance Management (MARIM) and also a member of the Advisory Board of the Malaysian Institute of Corporate Governance (MICG). As the Chief Procurement Officer, the **R6** is responsible for the management, administration, and supervision of the company's acquisition programs. The **R6** is also in charge of the contracting services and manages the purchase of supplies, equipment, and materials. For these purposes, the **R6** deals directly with contractors, vendors and suppliers, most of whom are SMEs. Prior to this, the respondent was the Vice President of the Group Business Assurance for the company and among his responsibilities were to look at risk management, business continuity plan and insurance management for this company. In addition, the **R6** has working experience in the insurance industry as a manager of an insurance company.

The seventh respondent (**R7**) is a manager of the business continuity and insurance management of a public listed telecommunication company in Malaysia. The **R7's** career in the company started in 2001 when the **R7** was appointed as an assistant manager of the insurance management unit. Prior to that, the **R7** was a senior executive in a commercial bank for four years and worked in an insurance company for five years. The **R7** has obtained a few professional certifications on BCM from Disaster Recovery Institute, Malaysia and Disaster Recovery Institute, United States.

Based on the academic and professional experience of all respondents, this research conducted a semi structured interview with each of them and analysed their opinions for the purpose of this research. Detailed analysis of their interview transcripts is explained in the next section.

4.2.2 Research philosophy

According to Saunders et al. (2009), research philosophy reflects the way we think about the development of knowledge, which consequently determines the way a particular research project should be undertaken and determines how the overall research process should be carried out. However, debate on this topic is never ended. Most of the central debates among philosophers concern matters of ontology and epistemology (Easterby-Smith et al., 2012). Easterby-Smith et al. (2012) describe ontology as being about the nature of reality and existence, while epistemology is about the best ways of enquiring into the nature of the world.

Generally, the discussion on research philosophies is around two main assumptions derived from ontology and epistemology; objectivism and subjectivism (Saunders et al., 2009) or also known as positivism and phenomenology (i.e. social constructionism) (Easterby-Smith et al., 2012).

Partington (2002) indicates that positivism is formed from combining logic and rationality with empirical observation. In addition, it supports the application of the methods of natural sciences to the study of social reality (Bryman & Bell, 2015). Easterby-Smith et al., (2012) highlight that the key idea of positivism is that the social world exists externally, and that its characteristics have to be measured using objective methods rather than being inferred subjectively by sensation, reflection or intuition.

Meanwhile, phenomenology is contradictory to positivism. Phenomenologists assume that logic and reality are produced based on the changes of experience (Partington, 2002) which requires social scientists to grasp the subjective meaning of social action (Bryman & Bell, 2015). Phenomenology focuses on the ways people make sense of the world by sharing experiences with others through the medium of language (Easterby-Smith et al., 2012).

Each of these two philosophies has its own advantages and disadvantages as stated by Easterby-Smith et al. (2012). Positivism provides wide coverage of the range of situations quickly and economically and facilitates statistics to be applied on larger samples. However, it is unlikely to provide deep understanding of the significance and processes people attach to actions. Positivism mainly focuses on answering questions like "what are the causes of variable x", and shows more commitment to quantitative methods (Johnson, Buehring, Cassell, & Symon, 2006). On the other hand, phenomenology contributes to the evolution of new theories by understanding people's meanings. However, phenomenological philosophy is difficult to control and the process of data collection is usually time-consuming (Sawalha, 2011).

Table 6 below shows the comparison between positivism and phenomenology in terms of ideology, characteristics of researcher, research progress and methods used.

Table 6: Comparison between positivism and phenomenology

Positivism	**Phenomenology**
Ideology	
• Objectivism: there is an external viewpoint from which it is possible to view the world or organisation. • Observer is independent	• Subjectivism: the world and organisations are socially constructed. • Observer is part of what is being observed
The researcher	
• Is an object of enquiry who believes that good research is done by undistorted recording of observations using efficiency-driven method of investigation. • Focuses on facts.	• Believes that 'to know' is to experience directly, immediately and purely • Focuses on meanings.

Research progress	
• Hypothetico-deductive. • Utilizes quantitative data. • Based on cause and effect. • Context-free. • Scientific and experimentalist	• Gathering data from which ideas are induced • Use of qualitative words • Mutual simultaneous shaping of factors • Context-bound • Humanistic and interpretivist
Preferred methods use	
• Taking large samples • Static design: categories isolated before study • Focus on explanation and prediction	• Exploring small samples in-depth or overtime • Emerging design: categories identified during research • Focus on generating local understanding

Developed by Sawalha (2011) based on Partington (2002); Maylor and Blackmon (2005); and Bryman and Bell (2015)

Based on the explanations above, this study adopts both the positivism and phenomenology philosophy as direction for the selection of research approach, time horizon and data collection methods because, some of the research objectives required quantitative elements such as large sample while some required qualitative words such as interviews. Both elements, quantitative and qualitative play significance and balance roles in this research because both elements are needed in achieving the research objectives.

4.2.3 Research approach

Induction and deduction are two approaches used in conducting research. These approaches are used to establish what is true or false in research and draw conclusions. Deduction is usually undertaken using a structured quantitative research method. Quantitative research involves

numerical analysis of data and enables the use of statistical procedures to answer research questions about perceptions, relationships and differences between measured variables (Ghauri & Grņhaug, 2010; Partington, 2002). Meanwhile, induction is usually undertaken using a qualitative research method. Qualitative research involves collecting data from words, narratives and observations (Saunders et al., 2009) and the data will be interpreted to answer research questions about the various views of phenomena rather than numbers (Bean, 2007).

Partington (2002) states that the research aim and objectives are the components that influence the selection of the approach to be used in the research. For this research, both approaches were used. Triangulation of primary data will be undertaken where qualitative data is used to corroborate and support quantitative findings (Bryman & Bell, 2015). The rationale for choosing both approaches for this research is:

1. The need for identifying the SMEs' perceptions on existing DRR program in Malaysia and assessing the key factors that affect their disaster resilience which required a survey to be done among SMEs. This approach, as argued by Ghauri and Grņhaug (2010), is deduction. On the other hand, information from regulators, experts and practitioners are also needed for this research to support the proposed BCM framework and this approach is inductive.
2. Both approaches are expose to risks. Deduction approach is risky because there are potential risks such as the non-return of questionnaires. In contrast, induction is a risky approach since there is fear of not getting useful data patterns and, thus, theory would not appear (Cooper & Schindler, 2008).
3. This research attempts to generalise the findings in order to represent the entire population and also to generate new ideas. This makes the deductive and inductive approach can be done together since deduction aims to generalise findings from sample to population, while

the inductive approach aims to generate theory or investigate new ideas (Saunders et al., 2009).

4.2.4 Research strategy

Research strategy is a plan that is used to answer the research questions (Saunders et al., 2009). According to Saunders et al. (2009) and Easterby-Smith et al. (2012), research strategy can be divided into these categories: action research, case method, collaborative research, cooperative inquiry, ethnography, experimental methods, grounded theory, narrative methods, quasi-experiment research, and survey research.

Experimental methods are more suitable to natural sciences research. The case study method aims to develop an intensive knowledge about a single case or a few cases. Grounded theory, cooperative inquiry, narrative methods and ethnography owe much to the inductive approach which, in turn, owes more to phenomenology. Action and collaborative research require the researcher to work side-by-side and collaborate with practitioners and therefore require the researcher to be a part of the organisation in which the research is undertaken. They also owe more to phenomenology (Easterby-Smith et al., 2012; Saunders et al., 2009).

Therefore, for this research, combination of survey research and case study was done in order to answer the research questions. As stated in the research philosophy section (See Section 4.2.2), this research combined the positivism and phenomenology philosophy as direction of this research process.

4.2.4.1 Survey research

Survey research is suitable for this research and it owes more to positivism. Survey research would help researchers to survey a large sample in order to generalise the findings and describe the entire

population's characteristics. Moreover, a survey strategy is a highly structured strategy that facilitates the collection of standardised data (Hair, 2003). Saunders et al. (2009) argued that the selection of the research strategy depends on a few factors including: the research aim and objectives; the constraints which are likely to face the researcher, such as access to data, geographical obstacles; and the time available to the researcher. Based on this discussion, and for the purpose of this research, a survey strategy was selected.

The rationale for this strategy is:

1. Survey strategy is usually associated with a deductive approach (Saunders et al., 2009).
2. Surveys are popular strategies used for studying large samples (Ghauri & Grṇhaug, 2010).
3. The survey strategy facilitates collecting various opinions and attitudes, as well as getting cause-and-effect relationships (Ghauri & Grṇhaug, 2010) which helps to achieve the research objectives.

4.2.4.2 Case study

Meanwhile, case study was also used in this research, especially in dealing with qualitative part of this research. As stated before, case study is owned by phenomenology (Easterby-Smith et al., 2012; Saunders et al., 2009).

According to Yin (2003) case study research is an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (pp13). In the definition, Yin (2003) covers the scope of case study research and range of characteristics. The definition acknowledges that the phenomenon and context are not always clearly distinguishable in real-life contexts. Among characteristics included in Yin's (2003) definition are; case study deals with technically distinctive

situations, relies on multiple sources of evidence, and benefits from prior development of theoretical prepositions to guide data collection and analysis. Yin (2003) also identified case study as the preferred research strategy when the phenomenon and the context are not readily distinguishable. However, definition given by Yin (2003) does not cover one of the most important characteristics of case study research; which is the use of a single case or a small number of cases, therefore, Dul and Hak (2008) defined case study as "a study in which (a) one case (single case study) or a small number of cases (comparative case study) in their real life context are selected and (b) scores obtained from these case are analysed in a qualitative manner" (2008, p4).

For this research, single case study was used because this research was only conducted among SMEs in single country, Malaysia. The rationale of using case in this research are highlighted below;

1. To focus on one single country only therefore it is easier to understand how the main issue of this research is dealt in the particular country and to propose solid solutions based on the current situation of the country.
2. Degree of control the researcher has over actual behavioural events. In this research, the researcher did not have control over the behaviour of SMEs or the natural hazard that impact them. The researcher was outside the "case" and was an observer. Further, there was no possibility of manipulating the behaviour of SMEs (independent variable) in order to investigate the impact on a dependent variable.
3. The issues being investigated were contemporary and about how the SMEs are affected, respond and cope with natural hazard currently; satisfying the third condition for selecting case study research proposed by Yin (2003).

4.2.5 Research time dimension

Research is also characterised by its time dimension. There are two types of research: cross-sectional and longitudinal. Cross-sectional studies are carried out once and represent a snapshot of one point in time. In contrast, if studies are repeated over extended periods and aim to track changes over time, they are known as longitudinal studies (Cooper & Schindler, 2008). There are a few factors determining the selection of the research time dimension including the time available for the researcher (Remenyi, 1998), research strategy (Bryman & Bell, 2015), and practicality for organisational research (Lee & Lings, 2008). Therefore, due to the time constraint and budget limitation, the cross-sectional type was selected in this research. Furthermore, both quantitative and qualitative elements of this research were designed concurrently to deal with the issues of time constraint and budget limitation.

4.2.6 Data collection methods

Cooper and Schindler (2008) defined data as: "*the facts that are presented to the researcher from the research environment. Data is characterized by its abstractness, verifiability, elusiveness and closeness to the issues being studied*" (Cooper and Schindler, 2003). There are two approaches to obtain data, primary and secondary sources. Primary data refers to the information obtained first hand by the researcher regarding the research variables (Sekaran & Bougie, 2013). The main advantage of primary data collection is it can contribute new knowledge to the research area (Hox & Boeije, 2005). This explains the significance of collecting primary data as it contributes to the novelty of research projects.

On the other hand, secondary data refers to information gathered by researchers from sources already existing or information or data that have already been collected by someone else. Collection of secondary data is easier and less costly compared to primary data (Blumberg,

Cooper, & Schindler, 2014). Usage of secondary data sources is also significant in research because it would expand the scope of the research by providing the researcher with the findings and experience gained from wider samples (Hox & Boeije, 2005). In general, Saunders et al. (2009) advise researchers to combine both data collection methods in the same study in order to gain benefits of each method.

Therefore, based on this discussion, and in order to gain the advantages of both, primary and secondary data sources were used in this research. In order to obtain primary and secondary data, there is a range of different data collection methods. Primary data collection methods include administered questionnaires and interviews. Secondary data collection methods used for this research include archives, publications, government documents, newspaper reports and internet databases.

4.3 Phase 2: Data collection

In the second phase of the research process and methodology, the core data collection was conducted. There are two methods used to collect data in this phase: secondary data analysis and survey.

4.3.1 Analysis of secondary data

Secondary data is the data used for a research project that were originally collected for some other purpose (Saunders et al., 2009). The secondary data can be collected from various publications and on-line sources. Easterby-Smith et al. (2012) highlighted that the task of the researcher is to interpret the data recorded in line with the particular study objectives.

For this research, government documents, newspaper reports, news reports and local statistical reports and databases were used to examine the impacts of natural disasters towards SMEs in

Malaysia in order to achieve the Research Objective 1. Similar sources were also analysed to assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs reducing the impacts of natural disaster in Malaysia in order to achieve the Research Objective 2. In addition, previous research was also reviewed to gain more information.

4.3.2 Interviews

Interviewing is a commonly used method of collecting information from people. It is an active interaction between two or more people, leading to discussion and context-based decisions (Mohd_Tobi, 2017). In addition, Yin (2003) stated that interview as one of the most important elements in case study research. Therefore, for this research, interview is used in order to get experts views in the research context.

Generally, interview can be divided into two categories; unstructured and structured. Unstructured interview provides freedom to interviewee and interviewer to discuss related topic in wider scope. It provides flexibility in interview structure, contents and questions. On the other hand, in a structured interview, the interviewer will provide a predetermined set of questions, using the same wording and order of questions as specified in the interview guideline.

For this research, the interview process was started by identifying potential respondents for the interview session. In getting different views, respondents were identified from various background and have experience in the research area. The background of the respondents was discovered in the Section 4.2.1.1. After that, the respondents were contacted through email and once the respondents agreed to participate in this study, the respondents were asked to propose date, time and venue of interview. At the same time, interview guideline was emailed to them. The interview guideline used for this research is attached as *Appendix I.* Among the topics covered in the

interviews are impacts of natural hazards, existing DRR programs and implementation of BCM among SMEs in Malaysia.

The approach for the interviews is combination of unstructured and structured interview, which is known as semi-structured approach. The purpose of the semi-structured interview is to ensure the interview covers the scope or context of the research and at the same time, allowed the researcher to get additional opinion from the respondents based on their experience and knowledge in the research area.

4.3.3 Questionnaires survey

Knight (2002) stated that a questionnaires survey is a good approach to get written responses from a large group of people. By using questionnaires, the researcher is enabled to pool data regarding people's behaviours, beliefs and opinions. It also enables the researcher to collect information about people's future expectations and perceptions regarding sources of risk and events (Neuman, 2014). In addition, many studies about SMEs, as reviewed in the literature review chapter, used a questionnaires survey as the main data collection method.

For the purpose of this research, a questionnaires survey was conducted among SMEs in Malaysia. This is important in order to get additional views of the research topic from the SMEs' perspective. The purposes of this survey were to identify SMEs' perception of existing disaster risk reduction (DRR) programs in Malaysia (Research Objective 3) and also to assess the key issues that affect the business resilience of SMEs to natural disasters (Research Objectives 4). In addition, the survey was also used to get new input for the established initial conceptual framework.

The survey was conducted on-line where the questionnaire had been delivered direct to the SMEs through their email address obtained from the database of the SMECorp Malaysia. A total of 1223

questionnaires were distributed to SMEs in the whole country for this research. All the respondents were given up to two months to complete the survey and five courtesy reminders by emails and phone calls were made. However, after the first delivery, the response rate for the survey was quite low. The details of the response rate are explained in Section 6.2.

The distributed questionnaires were a combination of open-ended and closed-ended questions. Open-ended questions were used in order to gain respondents' opinions for certain issues. This approach is suitable to be used in questionnaires in order to get new information or unexpected answers. Using closed-ended questions requires assigning numbers for each variable. These numbers will indicate the features of the issue being measured. In a questionnaire, three measurement levels are available: nominal, ordinal and interval/ratio (Bryman & Cramer, 2001). Every level represents the complexity of the used measurement. The nominal scale employs numbers as labels to categorise and identify people or objects. The ordinal scale is a ranking scale in which categories are ordered in terms of 'more' and 'less' of the concept of the questions (Bryman & Cramer, 2001). The interval/ratio scale employs numbers to rate objects or events in such a way that distances between the numbers used are equal. An interval/ratio scale provides the highest level of measurement. It has a unique origin of absolute zero point which allows the researcher to describe the differences between two subjects accurately in terms of a ratio (Hair et al., 2003). For this research, nominal and ordinal were used in the questionnaire to obtain various data including background of the respondents, impacts of natural hazards, disaster risk reduction programs (DRR), disaster resilience and BCM. In addition, multi-choices and open-ended questions were also used. Interval/ratio scale was not used in this research since there are no entities that can be measured precisely and have a unique origin of absolute zero point. In addition, the research involved collecting information regarding perceptions and to assess the key issues

among SMEs regarding the main problem investigated in this research, which are likely to be perceived differently by people.

Some of the questions in this questionnaire used five-point rating scales (Likert scale). The reason for choosing an odd number of categories in the scale is because the researcher felt that some respondents may have neutral feelings about some of the issues being examined. A five-point scale is a 'balanced scale' since the number of positive and negative categories is equal (Hair et al., 2003). The rationale for using a Likert scale is threefold:

1. The researcher felt that measurement of the variables can be made more easily using a Likert scale. This issue was addressed by Hair et al. (2003) who noted that using a Likert scale facilitates measurement of variables.
2. Scales allow the researcher to measure the direction (e.g. yes/no scale) and intensity of the responses (e.g. 'strongly agree' or 'slightly agree') (Hair et al., 2003).
3. Using a Likert scale facilitates the use of different statistical tools for the purpose of data analysis and testing (Bryman and Cramer, 2001).

In Section D of the questionnaire regarding business resilience and business continuity management, only Likert scale questions were presented because the purpose of the section was to evaluate the perception and knowledge of the respondents about business resilience and BCM.

4.4 Phase 3: Analysis, validity and reliability

In the final phase of the research process and methodology, tests were conducted using computer software in order to check the data consistency (reliability test) and also for data analysis. In addition, another interview was conducted in order to validate the developed framework.

4.4.1 Validity

Validity is an important aspect of both quantitative and qualitative research. According to Flick (2014), "*validity in research is referred to as the verification process of the findings employed by the researcher"*. Dellinger and Leech (2007) suggested factors to be considered in selecting the validation approach: type of research method (i.e. qualitative, quantitative or mixed); and the philosophy of the research (positivism, postpositivism, poststructuralism, and postmodernism).

For this research, construct validity will be used because it is appropriate to the research method (mixed methods) and philosophy (positivism). In addition, construct validity is suitable for researchers developing a research framework (Dellinger & Leech, 2007). The conceptual framework developed in this research will be validated by expert interviews. This is important to ensure the framework can be implemented in Malaysia. Therefore, the proposed interviewee is a decision maker for SMEs in Malaysia and also experts who have experience in the research area.

4.4.2 Reliability

As defined by McKinnon (1988), reliability is concerned with the issue of whether the researcher is collecting reliable data using a data collection instrument. This process concentrates on checking the consistency of the data. It is important to measure the uniformity of the responses to questions that make up an operational definition and to reduce any error in the measurement (Bryman & Cramer, 2001). Sekaran and Bougie (2013) state that the reliability of an instrument is an indication of both consistency and stability.

According to Allen, Bennett and Heritage (2014), reliability refers to the consistency or dependability of a measure over time, over questionnaire items, or over observers/raters. Two measurement approaches that can be used to check reliability are Cronbach's alpha and Cohen's kappa. For the purpose of this research, Cronbach's alpha is used because it can measure the

internal consistency and it is used to assess the extent to which a set of questionnaire items tapping a single underlying construct covary (Allen et al., 2014). The details of the reliability test conducted for this research are presented in Section 6.4.

4.4.3 Analysis

As stated before, this research used both qualitative and quantitative methods which is also known as mixed method (see Section 1.8). Semi-structured interviews (qualitative) were conducted while a questionnaire survey (quantitative) was distributed to obtain data for this research. In order to analyse data from both qualitative and quantitative approaches, a different technique was used for each approach. The next two sections will explain how the qualitative and quantitative analysis was done, while the results of this analysis will be discussed in Chapter 5 and 6.

4.4.3.1 Qualitative data analysis

The qualitative data for this research were analysed using '*Thematic Analysis*'. *Thematic analysis* is a method for identifying, analysing, and reporting patterns (themes) within data (Braun & Clarke, 2006). In addition, the authors stated that thematic analysis can be an essentialist or realist method, which reports experiences, meanings and the reality of participants, or it can be a constructionist method, which examines the ways in which events, realities, meanings, experiences and so on are the effects of a range of discourses operating within society. Therefore, this method is used because in this research, the respondents were asked questions which related to their own experiences in dealing with SMEs in Malaysia.

In order to conduct this analysis, research questions were developed and then interview questions were constructed based on the developed research questions. The analysis was done based on the guidelines outlined by Mohd_Tobi (2017). The author outlined the following steps in conducting qualitative analysis:

Step 1: Develop the interview questions.

Step 2: Transcribe the interviews into texts.

Step 3: Analyse the contents of the transcribed interviews using five strategies as suggested by Creswell (2014). The five strategies are data view, identify the code, reduce the information, count the frequency of codes, and link the codes.

Step 4: Analyse the contents using a computer application. For this research, the *ATLAS.ti* software was used to manage the data. Firstly, the transcribed interview texts were imported into the *ATLAS.ti* software. Then the folder for each code or theme developed in Step 3 were created in the software before the interviewees' quotations for each code or theme were classified into the folder.

Step 5: Cognitive mappings were developed in order to identify the relationship between identified themes and sub-themes. The purpose of the maps is to illustrate the idea or the main concepts for each research question by examining the patterns and relationships for each theme and sub-theme.

Finally, based on the developed themes, solutions for each research question will be discussed and proposed. Figure 4 summarizes the process of qualitative analysis for this research.

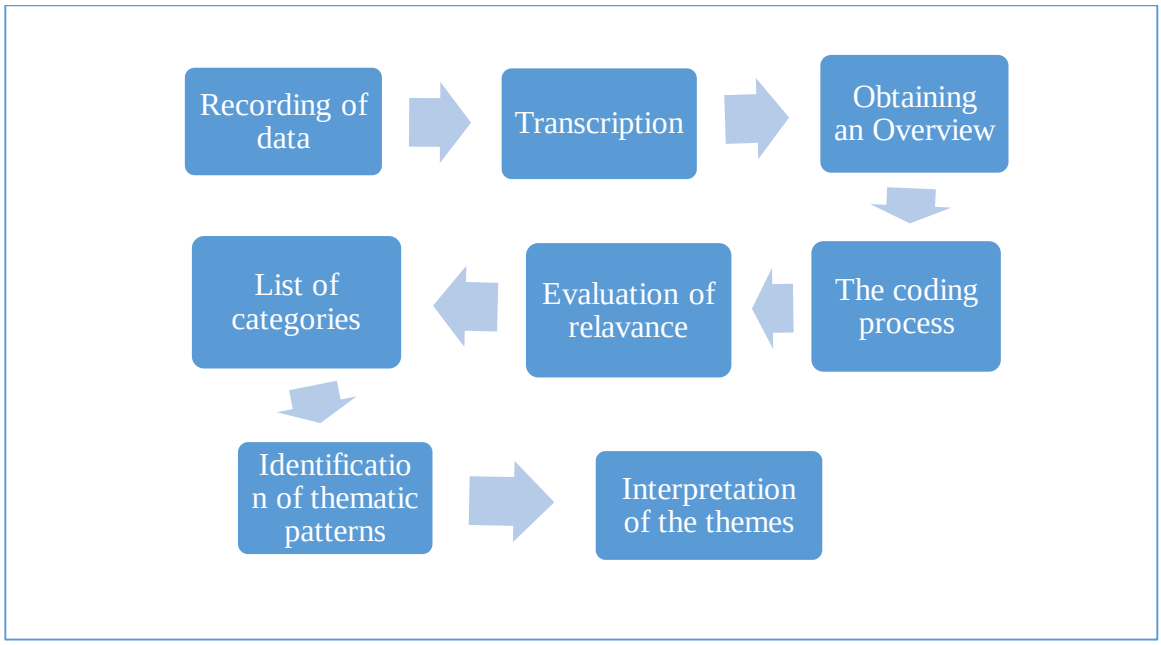

Figure 4: Process of qualitative analysis

4.4.3.2 Quantitative data analysis

In order to run the quantitative data analysis, all data obtained from the survey were coded into a Microsoft Excel spreadsheet before the spreadsheet was exported to the SPSS application. For the nominal data, the coding was done by assigning the highest rank of answer as 5 and lowest rank as 1. For example, in question 8 of the questionnaire (see Appendix III), the given options were "very much affected" which labelled as "5"; "much affected" =4; "somewhat affected" =3; "affected a little" =2; and "not affected at all" =1.

After the coding process, the quantitative data were analysed by two statistical methods: descriptive and inferential statistics. According to Bryman and Cramer (2001), descriptive statistics enable researchers to work out several statistical procedures such as frequency distribution, frequency tables, percentages, minimum, maximum, sum and mean. This type of statistic is usually used at the beginning of the analysis phase in order to provide preliminary results and guide the rest of the process (Cooper & Schindler, 2008).

Inferential statistics allow the researcher to use sample statistics to make statements about the entire population (Sawalha, 2011). Inferential statistics are categorised into two types: parametric and non-parametric (Sekaran & Bougie, 2013). In order to decide which category to use, Bryman and Cramer (2001) pointed out that the questionnaire's scale plays a significant role. The author claimed that to use parametric statistics, instruments for data collection should use at least an interval or ratio scale. For this research, although the questionnaire was developed using nominal or ordinal scales, the combination of parametric and non-parametric statistics was used to analyse the data because the number of sample is large (>20) as stated by Allen, Bennett and Heritage (2014).

4.5 The chosen methodology and research process

Based on the discussion above, the chosen methodology and research process are illustrated in Figure 5 below.

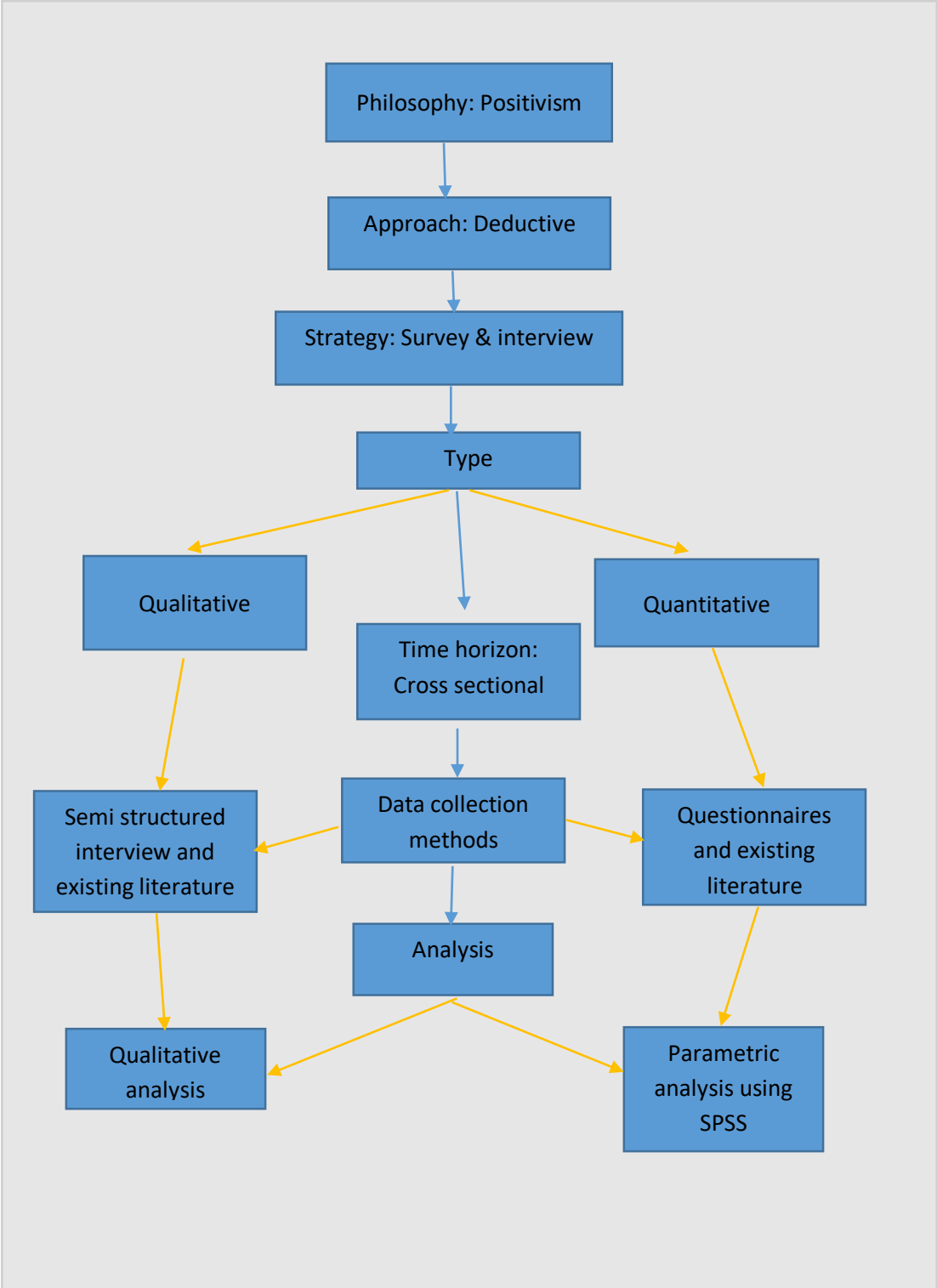

Figure 5: Chosen research process and methodology

4.6 Summary and link

Research methodology and process is an important element in doing research. It can be used as a driver for a researcher to drive to the correct direction if it is correctly selected. The research methodology and process used for this research is illustrated in Figure 5. After the research methodology had been decided, the next two chapters will show the results of the qualitative and quantitative data which were obtained from the interviews and survey.

CHAPTER 5

QUALITATIVE DATA ANALYSIS AND FINDINGS

5.1 Introduction

The purpose of this chapter is to analyse the qualitative data obtained from semi structured interviews. As stated in Section 4.2.1, seven semi structured interviews have been conducted in order to explore, understand and confirm the research gap. At the same time, the interviews might be used to answer the research questions. In addition, information gathered from the interviews might contribute to the proposed BCM framework. All interviews were analysed using 'Thematic analysis' approach supported by the *ATLAS.ti* software.

In order to run the analysis, the steps proposed by Mohd_Tobi (2017) are implemented (see Section 4.4.3.1). All the conversations during the interviews were recorded and transcribed into text documents. The documents were read several times to increase familiarisation with them. Then the documents were analysed by identifying all the 'codes' or 'themes' for each research question and priority was given to any word which was stressed and repeated by the respondents. After all related codes were listed, once again all codes were categorised to identify the most important themes for each research question. The purpose of the *ATLAS.ti* software is to manage the data and also to develop relationships between codes or themes.

This chapter is divided into two parts. The first part of this chapter will analyse the main contents of the interviews. This part is divided into Section 5.2, 5.3, 5.4, 5.5 and 5.6. The qualitative analysis technique used in this research is 'Thematic Analysis.' This analysis was done based on the research questions proposed in Section 1.5. The research questions of this research are:

1. How do natural hazards affect SMEs in Malaysia?

2. What are the roles played by related parties in supporting SMEs to manage natural hazards in Malaysia?

3. What are the perceptions of SMEs towards the existing DRR programs in Malaysia?

4. What are the factors that determine the disaster resilience of SMEs in Malaysia?

5. Can a guideline be developed for SMEs in managing disasters in Malaysia?

Finally, the final part of this chapter (Section 5.7) is the conclusion where a solid conclusion was made based on the data obtained and analysis conducted.

5.2 Impact of natural hazards to SMEs in Malaysia

The Research Objective 1 (**RO1**) of this study is "*Examine the impact of natural hazards on SMEs in Malaysia*." This research is trying to achieve the **RO1** through expert interviews and also a survey among SMEs' owners. The results from the survey will be presented later in Section 6.4.

In the interviews, one question which was directly related to this topic was asked. The question was *"Based on media and government reports, SME are exposed to natural disasters. That means the SME have high vulnerability towards natural disaster. Could you comment on the impacts of natural disaster to SMEs in Malaysia?"*

Based on the interviews, two respondents directly mentioned the impact of natural hazards to SMEs in Malaysia and other respondents agreed with the bad impacts of natural hazards to SME. **R1**, **R4**, **R6** and **R7** directly mentioned the negative impacts of natural hazards to SMEs in Malaysia. Table 7 summarized the result of the interviews.

Table 7: The impacts of natural hazards to SMEs in Malaysia

Theme	Sub-theme	Quotation	Source
The impact is bad	Severe	*"when natural disasters occur, the impacts is severe"*	R7
	Suffer	*"We are all know about it. They are really suffered. Some of the natural disaster that SME face are floods. Flood brought by heavy rain falls and monsoons…..mostly affecting states of Pahang, Terengganu, Kelantan and Johor."*	R4
	Worst	*"As I mentioned just now, that was the worst disasters. It was a catastrophe especially in Kelantan. "* *"I don't have the actual figure but maybe you can search it online because I believed there is a statement by the minister stated how much damages being done by flood that affected SME within those areas. I not remember the figure but you can check in The Star newspaper."*	R1
	Lost business	*"You imagine if you just started a small business…..you spent about half million ringgit Malaysia as your start-up capital. Then suddenly your business hit by flood…..total loss. You lost your investment of RM500,000 unless you covered by insurance. In addition…you lost your income….you lost your customers. At the same time…you also might lose your personal properties like other individuals because you are not only business owners but also you have your own house….and your personal properties."*	R6

From the sub-theme "**severe**", '**suffer**", "**worst**" and "**lost business**", the main theme was developed and the main theme is "**The impact is bad**" to indicate that the impact of natural hazards to SMEs in Malaysia is bad.

Furthermore, there were some respondents who gave some explanation to support their argument. Table 8 presents the explanation made by the respondents to support their argument on the impacts of natural hazards to SMEs. Most of the respondents explained the causes of the main issue of the **RO1**. Among the causes that contributed to the impact of natural hazards are '**location**' (**R4** and **R5**), '**low awareness level**' (**R2**, **R4**, **R6** and **R7**) and '**no capability**' which includes '**lack of resources**' (**R2, R3, R4, R5** and **R7**) and '**size of business**' (**R4** and **R7**).

Table 8: Themes to support the impacts of natural hazards to SMEs to SMEs in Malaysia

Theme	Sub-theme	Quotation	Source
Location		*"Most of these SMEs are located in low land areas…..away from that main prime area and some of them are in industrial zones and industrial belts where it designated….they are there."* *"Most of low land areas are prone to flooding…..close to large rivers which is can also flood and also by hillside which exposed to landslides."* *"Most of the time these large big companies are located in very well zone areas for their business with all necessaries and amenities are well provided. They go to designated areas where everything in planned so flooding wise….water retention…power wise….everything has been taken care off. They spent a lot of money for that so they are in better locations compared to the SMEs."*	R4
		"They are depending on sectors…locations…..likelihood….financial producer institutions are exposed or complicit in production and effect of disasters."	R5
Awareness		*"I also noticed that SME in Malaysia are less awareness on this problem."* *"So the most important thing is exposure or awareness…"*	R2
		"…they should know about period of monsoon that caused floods…" *"They must know what are risky for them? Is it floods? Monsoon? Storm? Lightning thunders? Low land area? What their risk?..."*	R4
		"Awareness is the good thing to start." *"…this type of business do not care what are happens around them."*	R6
		"…it will create awareness and from awareness, it will create preparedness." *"…it also might increase risk awareness, preparedness and mitigation to the SMEs."*	R7
Capability	Lack of resources	*"…they have no choice because they still have to run their business. Stop their production means no income for them…"*	R2
		"They don't have the budget or funding available." *"…lack of adequate resources. They don't have trained people to do this."*	R4
		"they have limited resources"	R5
		"…large companies have resources….they can do things….not only financial resources but also human	R3

		resources…..they have expertise…so they can do things." *"They have limited resources and vary business priorities until they get affected by extreme weather and natural disasters, then they will give priority in this issue."*	
		"For small business, their financial condition not allow them to invest in this aspect."	R7
	Size of business	*"Many SMEs in Malaysia are run actually as a micro company. Small scale."* *"because we are huge corporation with well-structured risk management and disaster preparedness, we are able to reduce our risks and our losses."*	R7
		"bigger firms are better prepared in term of disaster planning, response and recovery"	R4

From the developed themes and sub-themes, relationships between each theme and sub-theme were created and presented in Figure 6. For the interviews, the respondents agreed that the impact of natural disasters to SMEs in Malaysia is bad because of their location, lack of awareness and lack of capability.

Figure 6 was developed based on the identified themes in the interview with assistance of the *ATLAS.ti* software. When the main and sub-themes were identified, the relationship between all themes and sub-themes is assessed as some of them are related to each other. The relationship is assessed in terms of '*association*', '*cause*' and '*part of*'. For example, most of the sub-themes are the *cause* of main themes. In this situation, the relationships' '*cause*' was used. The same approach is also used in Figures 7 and 8.

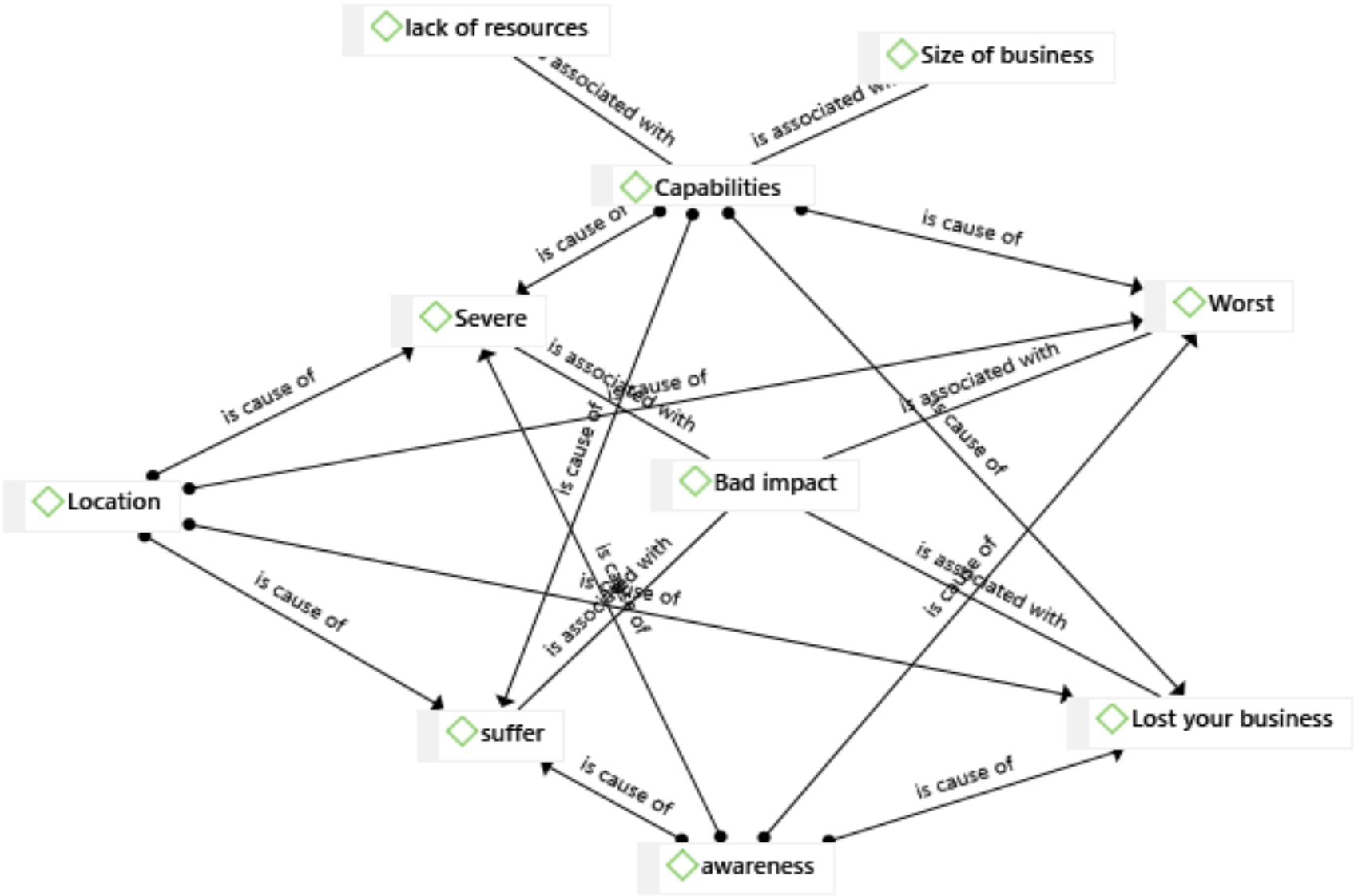

Figure 6: Relationship between themes in examining the impacts of natural hazards to SMEs

In the interviews also, different types of impacts were determined: business and personal impacts. Business impacts consist of production, operations, supply chain and market, while personal impacts include income and property loss. **R2** mentioned impact to SMEs if they stop their production where they will lose their income. Meanwhile, **R4** stated that natural hazards can affect SMEs' production and operation, such as drought can affect the water supply to SMEs. **R2**, **R4** and **R5** highlighted the issue of the supply chain where, if natural hazards hit, it is difficult for SMEs to get their supply and hard for them to continue production and market their products. The respondents also stated that many SMEs were actually the supplier for large companies, so the affected supply chain also might affect the large companies. Furthermore, **R5** and **R6** mentioned how the natural hazards result in loss of customers for SMEs.

R2 and **R6** highlighted the income problem where affected SMEs will lose their income during and after natural hazards. **R6** mentioned that this is a big problem for SMEs because most of these SMEs run their business as their main personal income to support their personal life. **R6** also highlighted that SMEs' owners can also lose their personal properties such as houses because when the catastrophe hits, it not only affects business areas but also residential areas. Table 9 summarized the development of themes of the types of impacts that affect SMEs in Malaysia. Finally, these impacts contributed to the high vulnerability of SMEs in Malaysia towards natural hazard in Malaysia as stated by **R2, R4, R5, R6** and **R7**. Table 10 shows quotations of respondents on vulnerability of SMEs in Malaysia towards natural hazards.

Table 9: Themes of the types of impact that affect SMEs in Malaysia

Themes	Sub-themes	Quotation	Sources
Business impacts	Production	*"Stop their production means no income for them."*	R2
	Operations	*"So drought is something that affecting….less of water….because some of SMEs depend on water for their*	R4

		operations and production. So when there is water rationing….they will highly affected."	
		"How does floods affect the premises…your people and your customers and your supply chain?"	R5
	Supply chain	*"… they get local resources and they sell it locally."*	R2
		"But nevertheless we have to understand that these SMEs support the large and big companies. They could be the suppliers of raw materials…..certain finished good for the big companies and factories to complete their end products." *"…the supply chain is going to be affected and they may lose their business because the big companies that very big…huge and financially strong will look for another suppliers as well."*	R4
		"How does floods affect the premises…your people and your customers and your supply chain?" *"It depending on your supply chain….your sector where your stuff worked. Extreme weather such as snow might affect your supply chain if your business is agricultural based."*	R5
	Market	*"How does floods affect the premises…your people and your customers and your supply chain?"*	R5
		"In addition…you lost your income….you lost your customers."	R6
Personal impacts	Loss of income	*"Stop their production means no income for them."*	R2
		"In addition…you lost your income….you lost your customers." *"Different story for SME…..many SMEs in Malaysia were established as the main income sources for the business owners. Their main purpose is to get money for their selves and their family."*	R6
	Property loss	*"…you also might lose your personal properties like other individuals because you are not only business owners but also you have your own house….and your personal properties."*	R6

Table 10: Themes of vulnerability of SMEs towards natural hazards in Malaysia

Level of vulnerability	Quotation	Source
More vulnerable	*"So that make them more vulnerable compare to larger companies."*	R2
High vulnerable	*"Some attribute why SME has high vulnerability to disasters…"*	R4

	"But in reality yes is it quite hard because you talking about something that not really likely and these SMEs dealing with different risks every day and they are very vulnerable."	R5
	"You imagine if you just started a small business…..you spent about half million ringgit Malaysia as your start-up capital. Then suddenly your business hit by flood…..total loss. You lost your investment of RM500,000 unless you covered by insurance. In addition…you lost your income….you lost your customers. At the same time…you also might lose your personal properties like other individuals because you are not only business owners but also you have your own house….and your personal properties."	R6
	"…these SMEs have high vulnerability…"	R7

5.3 Roles of external parties

The **RO2** of this research is "*assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs to reduce the impacts of natural hazard in Malaysia*." The main interview question for this part is "*What roles can be played by the government in supporting SMEs to reduce the impact of natural disaster in Malaysia?*". In addition, other questions were asked in order to get the respondents' opinions on the roles of private companies and NGOs.

From the interviews, every party played its own roles. However, the main themes of roles derived from the interviews are '**Financial assistance'**, '**Training and awareness programs**', '**Legislation**' and '**Humanitarian assistance'**. Table 11 summarizes the themes developed for the **RO2**.

Table 11: Themes of the roles of stakeholders in disaster management in Malaysia

Theme	Sub-theme	Sub-theme	Quotation	Source
Financial Incentive	Assistance from government	Grants and loans	*"In term of finance, they are many financial assistances provided by the government." "However, these financial assistance is a tool to reduce their loss….not to compensate their total loss."*	R2

			"These are the kind of reliefs….grants provided."	R3
			"Maybe the government can provide soft loans or other financial assistance to SMEs."	R7
		Subside	*"Government can subside BCM trainings and awareness programs because BCM training can be little expensive because you have foreigner coming to teach or local experts come teaching. It quite expensive. It can come with some scheme under MIDF or other government agencies to subside the costs of the training, then it will be effective."*	R4
		Taxation	*"Then provide them with tax incentives."* *"… government give them certain tax deduction."*	R4
	Financial assistance from private companies	Low interest rate	*"…financial and insurance institutions should consider interest rebate and lower insurance premium to SME…"*	R4
			"Banks can offer soft loan with low or zero interest rate for SME…"	R6
			"Control in term of interest rates charged….insurance premium."	R7
		Low insurance premium	*"…financial and insurance institutions should consider interest rebate and lower insurance premium to SME…"*	R4
			"Control in term of interest rates charged….insurance premium."	R7
			"How can you expect SME…which do business for their life survival….can buy insurance protection with high price? Reduce the price."	R6
Training and awareness programs	Government agencies	Create awareness	*Another thing to do is to open conversation with lower level. Let people give their words. Conversation with lower level also important in increasing awareness among people.*	R5
			"Awareness is another issue to say here. I'm not talking about BCM awareness but more on risk management awareness."	R6

			"So the roles of government here is to create this awareness."	
		Preparedness program by the government	*"Rather than preparedness…especially preparedness for businesses has not been key feature in any government responses in developing countries."* *"But if you go for preparedness, all of these losses can be minimised."*	R3
		Give advice	*"They also should work closely with government agencies such as the SME Corp so they can get advice on this issue."*	R2
		Training and awareness programs by the government	*"More training session and awareness programs should be conducted by the government or anybody to make SME more aware and understand the need of these approaches."* *"The government also should provide necessary training"* *"… so government should support by providing such trainings for free or at least at affordable price."*	R2
			"As I said earlier…training, awareness and implementing." *"… they can hold forums and seminars for SME owners…"*	R4
			"Training also might useful. If you create awareness you also must conduct training on it."	R6
			"But in term of awareness programs for the training session, I prefer for the government to handle it."	R7
	Private companies	Knowledge transfer	*"Most big companies have capability for implementing BCM and risk management…..so why not they share this with SMEs. Knowledge transfer."*	R6
		Provide training	*"… we still consider their proposal and usually we will ask them to join our in house training on BCM if their proposal was accepted."*	R6
		Educate	*"Lot of large companies here and they can educate these SME"*	R4
	NGOs	Preparedness programs	*"They also do preparedness….rising awareness….and things like that."*	R3

		Training and awareness programs	*"Previously we talked about training and awareness programs…..here NGOs can play their roles."*	R6
Legislation	Government		*"Make it compulsory."* *"… so far there are no regulations to govern it, but government need to start it."*	R2
			"They don't have regulator or authority to enforce the implementation."	R4
			"…the government introduced the Climate Change Act and it must be complied by all government agencies. So legislation can play role here…"	R5
			"Personally I think many roles can be played by the government but the most important thing is…put legislation on it." *"Currently there is no legislation or rule that obligate these SMEs to implement risk management or BCM."* *"… you need to consider any legislation that currently available and can be used to support your framework."*	R6
			"The most important thing for me is legislative. All the government programs might successful if there is legal requirement for that."	R7
Humanitarian assistance	NGOs		*"They coming with all assistant such as mineral waters, foods, shelters, and other things to help people."*	R4
			"So they maybe involve in cleaning the flood area……distributing foods….assisting emergency services and those charity works."	R5
			"Their functions more to help local authorities to distribute food, water, help in evacuation centres etc."	R6
			"If you want them to distribute drinking water…foods….clean up the affected areas…..maybe you can ask them."	R7

5.3.1 Financial incentive

Both the government and private companies can provide financial incentive for SMEs. According to **R2** and **R3**, the government through its agencies should provide grants and loans for affected SMEs. The purpose of this financial assistance is to reduce the financial burden to affected SMEs to ensure their survival and resilience. In addition, **R4** proposed that the government provides subsidy and tax rebate for SMEs that take necessary action in mitigating disaster such as being involved in any DRR program or implementing BCM as part of their daily operations.

Meanwhile, **R4, R6** and **R7** stated the roles to be played by financial institutions such as banks, where banks can reduce their interest rates for SMEs that are affected by natural hazards. They also suggested that insurance companies reduce the insurance premium for SMEs that anticipated DRR programs as part of their incentives.

5.3.2 Training and awareness programs

The second theme under the **RO2** is '**Training and awareness programs**'. Under this theme, sub-themes ware divided into three categories: '**government'**, '**private'** and '**NGOs'.** According to **R5** and **R6**, the government are responsible for creating awareness among SMEs to enhance their preparedness. Awareness can be created by holding an open conversation with them as proposed by **R5**, and also through training programs such as awareness and preparedness programs, as suggested by **R2, R3, R4, R6** and **R7**. At the same time, these SMEs must work closely with the government so that it is easier for them to get related advice, as proposed by **R2**.

On the other hand, private companies can also play their roles in this part. They can educate these SMEs by sharing their expertise and also conduct training, as proposed by **R4** and **R6**. According to **R3** and **R6,** NGOs can also be involved in this part by conducting series of training and preparedness programs by SMEs.

5.3.3 Legislation

'**Legislation**' is another theme derived in this area. However, based on the interviews, legislation is a role to be played by the government only. **R2, R4** and **R6** stated that currently there is no law or regulation that require SMEs to engage with any DRR programs conducted by the government or private company. **R2** and **R6** urged that this regulation should be introduced and made compulsory for SMEs to comply with. This statement is supported by **R5** and **R7** who stated that introduction of new regulation is important to ensure success of the DRR programs.

5.3.4 Humanitarian assistance

The final theme developed in assessing the roles of all related parties is '**Humanitarian assistance**'. **R4, R5, R6** and **R7** agreed that this is the role dominated by NGOs. The respondents agreed that NGOs have not played major roles before disaster occurs but will play significant roles during and after the natural hazards. Roles which can be played by NGOs include distributing food, water and assisting emergency services.

Therefore, based on Table 10, many roles can be played by government, private companies and NGOs. Some of them can only be played by the government, such as drafting legislation, giving taxation rebate and providing subsidies. At the same time, private companies such as financial institutions can play a major role in controlling interest rates and insurance premiums, while the main role played by NGOs is providing humanitarian assistance during and after disasters.

Meanwhile, the government, private companies and NGOs should work together in creating awareness and providing training to the SME owners. Offering financial assistance such as soft loans and grants is something that can be provided by government through related agencies and private companies. Figure 7 presents the relationship of the developed themes in assessing the

roles of government, private companies and NGOs in supporting SMEs to reduce the impacts of natural hazard in Malaysia.

5.4 SMEs' perception of existing DRR programs in Malaysia

In this section, this research tried to identify the SMEs' perception of existing DRR programs in Malaysia, as stated in the **RO3**. However, it is quite difficult to identify their perception through the interview session because none of the respondents is the SME owner. In addition, no specific question about this was asked during the interview.

Nevertheless, there are still a few respondents who touched on this issue indirectly based on their experience in dealing with SME owners. Therefore, a brief analysis was conducted in order to identify related themes on SMEs' perception. Further analysis of this part will be presented in Section 6.7 which discusses the result of a survey conducted among SME owners.

Based on the interviews, the developed themes were: 1) '**Awareness**', where many of the SME owners are not aware of the DRR programs conducted in Malaysia. Some of them are aware of the existence of related insurance products but their understanding of it is low (**R2** and **R6**). However, according to the **R1**, SMEs are aware of the financial assistance provided by the government based on the high application number; 2) '**Affordability**', where many SMEs cannot afford to participate in the DRR programs, including buying insurance protection due to high premium (**R6** and **R7**) and inadequate budget (**R2** and **R4**), and 3) '**Training**', which refers to the need for training for SME owners to create awareness and make them more prepared (**R2** and **R4**). Table 12 shows the development of the themes based on the interview sessions.

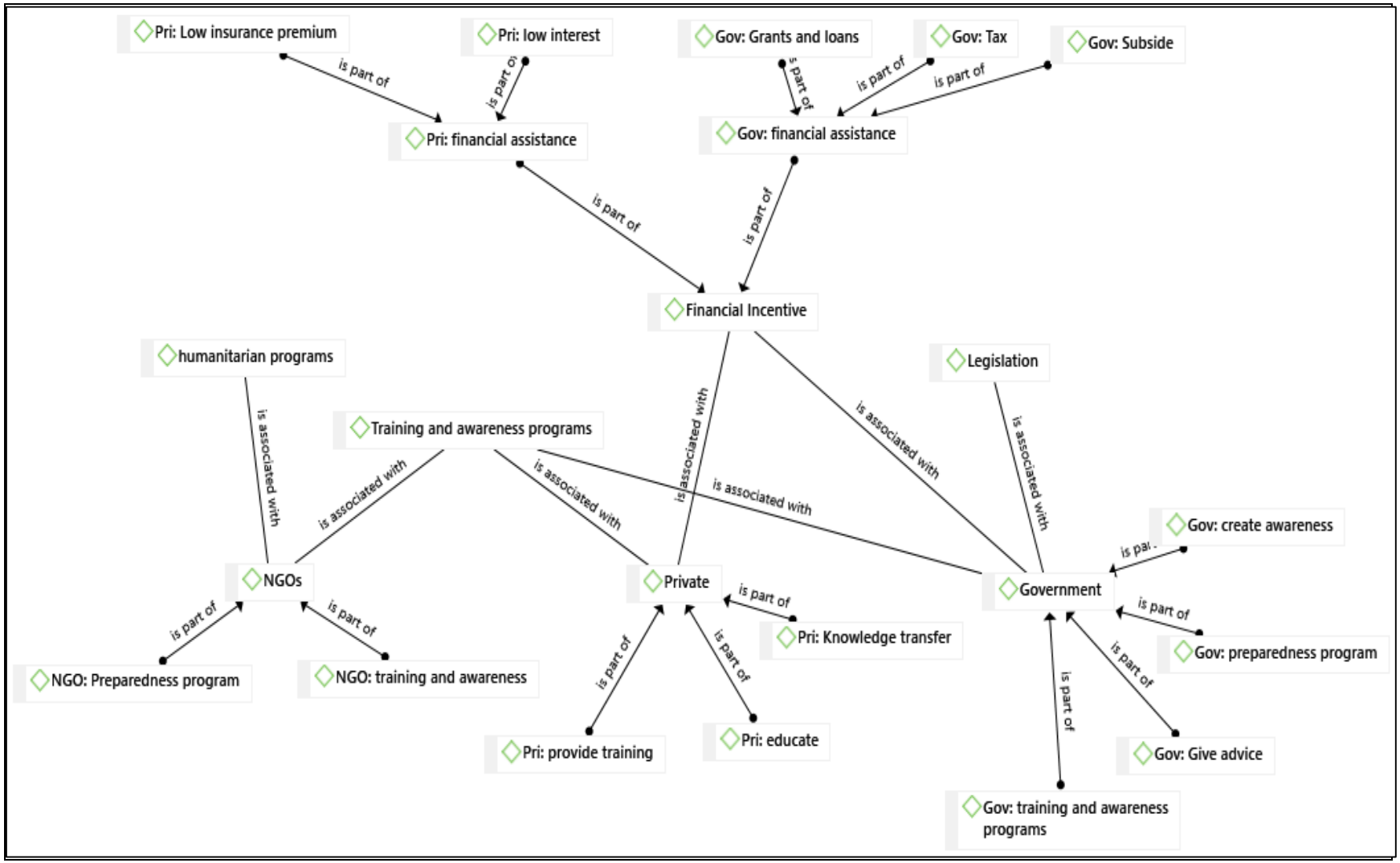

Figure 7: Relationship of the developed themes in assessing the roles of stakeholders in supporting SMEs to reduce the impacts of natural hazards in Malaysia

Table 12: Themes to identify SMEs' perception of the existing DRR programs

Theme	Sub-themes	Quotation	Source
Awareness	Not suitable for SMEs	*"For them BCM is only for big and large companies. But these people…I means SMEs also can do it in smaller scale."*	R4
		"For most of the SME, they are not aware the need of BCP and DRP. For them this is not necessary."	R1
	Not aware	*"Unfortunately, based on a survey done by my research team, not many SME aware about this assistance."*	R2
		"Awareness is another issue to say here. I'm not talking about BCM awareness but more on risk management awareness. Many SMEs in Malaysia do not aware on this."	R6
	SMEs are aware	*Quite a lot. If you refer to the Kelantan flood last year, we have received more than 1000 applications.*	R1
Affordability	High premium	*"Insurance is another approach but the problem with insurance is they are profit oriented. Usually premium for disaster insurance is very high…"* *"Unfortunately….SMEs in Malaysia are not afford for this premium."* *"Currently our insurance companies do offer this protection but the price is ridiculous."*	R6
		"Disaster insurance is not cheap in Malaysia."	R7
	Waste money	*"So they feel that doing BCM….spend some money for it is not worth it."*	R4
	Expensive	*"… it too costly for them and I am sure they are not understand the purpose of each approach."*	R2
		"…because you have foreigner coming to teach or local experts come teaching. It quite expensive."	R4
	No budget	*"Some of the reason I come out are…..first…..inadequate budget. They don't have the budget or funding available."*	R4
Training		*"… the most important thing is exposure or awareness. More training session and awareness programs should be conducted by the government or anybody to make SME more aware and understand the need of these approaches."*	R2
		"… so better we go and looking all factors those affect the SMEs….doing awareness….doing trainings…"	R4

5.5 Key issues that affect the disaster resilience of SMEs

Disaster resilience is significant for SMEs in Malaysia in order to ensure their survival. Therefore, this section will assess the key issues that affect the disaster resilience of SMEs in Malaysia (**RO4**). Although there was no specific question to discover the key issues, all respondents highlighted the key issues throughout the interview sessions.

From the interviews, seven (7) main themes were developed from the sub-themes. The seven themes are '**legislation'**, '**preparedness'**, '**low capability'**, '**location'**, '**mindset'**, '**awareness'** and '**support'**. All the main themes and selected sub-themes as well as related quotations are presented in Table 13.

Table 13: Themes to assess the key issues that affect the disaster resilience of SMEs to natural hazards

Theme	Sub-theme	Quotation	Source
Legislation	Currently no regulation	*"Before this risk management and OSH are uncommon among companies in Malaysia but after the government introduced related acts and regulations, nowadays all listed companies practice it."*	R2
		"The main problem here in Malaysia is there's no regulations that govern this ISO standard."	R6
		"So far as I know no such regulation…"	R1
	Introduce new regulation	*"Personally I think many roles can be played by the government but the most important thing is…put legislation on it."*	R6
	Mandatory	*"Make it compulsory."*	R2
		"…the government introduced the Climate Change Act and it must be complied by all government agencies. So legislation can play role here."	R5
	No regulator	*"They don't have regulator or authority to enforce the implementation."*	R4
Preparedness	Disaster mitigation	*"… they need to develop and implement measure to mitigate the disasters."*	R4
	Develop DRR plans	*"… develop disaster recovery plans and recovery preparedness plans."*	R4
	Review existing plan	*"Then they need to review and test the disaster recovery plans regularly at least once in every quarter year."*	R4

	Involvement	*"…SME owners and employees must get involve in disaster mitigation programs."*	R4
	Risk assessment	*"More than that I would recommend a proper risk assessment."*	R4
	Back-up and recovery	*"…also protect critical information by implementing back-up and recovery processes."*	R4
Low capability	Lack of expertise	*"Although their employees are quite highly skilled, but more on production oriented skills…..not disaster management skills"*	R2
		"They are also lack of adequate resources. They don't have trained people to do this."	R4
		"… no expertise in the context of disaster management."	R5
	Lack of finance	*"But if you look to SME, they are short of everything……short of money…"*	R2
		"…inadequate budget. They don't have the budget or funding available. Or maybe they don't want to spend the money."	R4
		"Unfortunately….they have limited resources. Not much money"	R5
		"… the main problem for this approach is their capability to pay premium. Disaster insurance is not cheap."	R7
	Less option	*"…they have no choice because they still have to run their business. Stop their production means no income for them."* *"…not every small business can move to other locations because some SME run their business locally…..they get local resources and they sell it locally."* *"… for SME in Kelantan…..they still do their business in Kelantan even though they know Kelantan will be hit by flood every year. So what their option? To move to another state…..I don't think that is a practical step."*	R2
	No financial assistance	*"However, this financial assistance is a tool to reduce their loss….not to compensate their total loss. Unfortunately, based on a survey done by my research team, not many SME aware about this assistance."*	R2
Location	Move to safer place	*"For example to move to safer location…"*	R2
	Refuse to move	*"In Malaysia if you can see most of the disasters those happening to SMEs…..after it happened they just go back and relocate at the same place. They don't move and they continued their business there. And not*	R4

		knowing when the next disasters would happen and affect them."	
		"They still run the business in a same place even that place hit by same disaster every year."	R7
	Risky area	*"If it hit factories…SMEs…residential areas location……they gonna be affected."* *"Some attribute why SME has high vulnerability to disasters is due to the location."* *"Most of these SMEs are located in low land areas…..away from that main prime area and some of them are in industrial zones and industrial belts where it designated….they are there. Most of low land areas are prone to flooding…..close to large rivers which is can also flood and also by hillside which exposed to landslides."*	R4
		"They are depending on sectors…locations…..likelihood…."	R5
	Local business	*"SME run their business locally…..they get local resources and they sell it locally."*	R2
		"maybe has problem due to the disperse nature of SME. Disperse nature and disasters mostly are localised."	R4
Mindset	Difficult to change	*"It is time to change their paradigm and perspectives on this. But in reality….it is hard to change their mind set."*	R6
	Can survive	*"They said they can survive."*	R4
	Not suitable for SME	*"For them BCM is only for big and large companies."*	R4
	Never learn	*"In Malaysia if you can see most of the disasters those happening to SMEs…..after it happened they just go back and relocate at the same place. They don't move and they continued their business there. And not knowing when the next disasters would happen and affect them. That shows that their mind set need to be changed."*	R4
		"It good way to talk about disaster to SME. Very difficult to educate SMEs on it."	R5
		"My third point is they never learn."	R7
	Not affect them	*"…most of the SME assume they will not be affected by any natural disasters…"*	R4
	Not interested	*"…lack of management interest. Their management is not interested in doing BCM. They are more interested in running the business…selling the products and getting the money."*	R4
		"They might not interested in this thing unless….as I've said…they have been affected by disasters."	R3

Awareness	No awareness	*"I also noticed that SME in Malaysia are less awareness on this problem."*	R2
		"They don't care about the impacts of disaster because they don't want to know about it and they have no idea at all about disaster management." "Awareness is another issue to say here. I'm not talking about BCM awareness but more on risk management awareness. Many SMEs in Malaysia do not aware on this." "They run their business without considering risks around them that might affect their business operations."	R6
	Create awareness	*"More training session and awareness programs should be conducted by the government or anybody to make SME more aware and understand the need of these approaches."*	R2
		"Conversation with lower level also important in increasing awareness among people."	R5
		"… it will create awareness and from awareness, it will create preparedness."	R7
	Training	*"…to attend any training to make them more prepared…"*	R2
	Failed to recognize risks	*"… theses SMEs must recognise what impacts them the most? What disaster can affect them." "…what are risky for them? Is it floods? Monsoon? Storm? Lightning thunders? Low land area? What their risk? Once they know what their risk is….they should know how to mitigate it."*	R4
		"SMEs dealing with different risks every day. I think if you talk about Malaysia and Malaysian experience in in losses of flood…that something useful."	R5
Support	Government support	*"…so government should support by providing such trainings for free or at least at affordable price."*	R2
		"…they provide immediate responses and relief." "… they will provide some grants or something like that aimed small businesses and people affected small amount of the whole amount losses and suffered by these people."	R3
		"Government agencies…in this case maybe the SMECorp must conduct trainings, seminars, workshops and other programs to remind these SMEs how importance for them to handle and control these disaster things." "… maybe the government can provide insurance scheme like social insurance for SMEs. Make it compulsory for all SMEs because in insurance	R6

		principle, if you can get many contributors….premium become less and less."	
		"Even our government has built and introduced few disaster mitigation projects…" *"Maybe support. Support can be in various types……financial…training….legislative…etc."*	R7
		"…we do have a program initiative as well as strategies to support the development of SME in Malaysia,…" *"… we started the initiatives on emergency management where we worked closely with the National Disaster Committee and we introduced an emergency fund."* *"First is matching grant and reimbursement."* *"…we also give them soft loan."*	R1
	Private support	*"… a few in insurance or financial aspects, but a lot in term of CSR. From CSR perspective there are a lot multinational corporations, GLCs and other went down and try to support…"*	R1
		"…there are a few consultant companies those provided trainings…" *"It would be great if they can share their expertise with SME as part of their CSR."*	R2
		"This is social responsibilities. So I'm looking at corporate social responsibilities of big companies. Lot of large companies here and they can educate these SME…"	R4
		"… the support groups or people the SMEs relies more on after disasters are insurance. So if you do something on insurance, it would be very effective."	R3
		"Most big companies have capability for implementing BCM and risk management…..so why not they share this with SMEs. Knowledge transfer." *"Banks can offer soft loan with low or zero interest rate for SME."*	R6

5.5.1 Legislation

The first theme developed from the interview is '**Legislation**'. From the interviews, three respondents (**R1, R4** and **R6**) agreed that currently there is no legislation or regulation for SMEs in Malaysia to implement DRR. This opinion was supported by **R6** who suggested the need to introduce new regulation about this matter, while **R2** and **R5** insisted for all SMEs in Malaysia to

comply with the new regulation or legislation mandatorily. Furthermore, **R2** and **R6** highlighted the non-existence of a regulator to govern all SMEs in Malaysia because without a regulator, it is difficult to apply regulation to the SMEs.

5.5.2 Preparedness

The second theme is '**Preparedness**'. **R3** highlighted the importance of this theme as it can reduce cost and make SMEs more resilient. In order to become more prepared for disasters, **R4** suggested several actions to be taken by the SME owners and employees which is to include SME involvement with existing DRR programs. However, this suggestion is difficult to implement because most of the SMEs are not aware of the DRR programs available in Malaysia. This awareness issue will be discussed later in the theme '**Awareness**' (Section 5.6.6). Furthermore, **R4** also suggested other actions such as disaster mitigation, development of DRR plan, review of existing DRR plan, back-up and data recovery and risk assessment. **R4** believed that SMEs are highly prepared for natural disaster if they can apply these suggestions. Therefore, all of these suggestions are considered as sub-themes under the main theme of '**Preparedness**.' In addition, sub-theme '**training**' (Section 5.6.6) is also part of '**preparedness**' because, according to **R2**, training is useful to make SMEs more prepared for disasters.

5.5.3 Low capability

The third theme is '**Low capability'**, which is developed from four sub-themes: '**lack of expertise**', '**lack of finance**', '**less option**' and '**no financial assistance**'. '**Lack of expertise**' was derived from interviews with **R2**, **R4** and **R5** where they stated that SMEs have highly skilled workers but not in the area of disaster management. Meanwhile, **R2**, **R4**, **R5**, and **R7** indicated that SMEs in Malaysia have no or maybe limited financial capability to invest in disaster management. In addition, as stated in Section 5.5, several respondents agreed that many SMEs

cannot afford to pay insurance to protect their business. Furthermore, **R2** indicated the limited option for SMEs which resulted from low capability. Limited option means the SMEs are not able to move to safer places because of their low capability including limited money and they also unwilling to lose their existing market and customers. The sub-theme less option is also associated with other themes: '**Location**' (Section 5.6.4) and '**Mindset**' (Section 5.6.5). On the other hand, **R2** highlighted the issues of no financial assistance provided by government agencies and private companies. However, this opinion is contradicted by other respondents who indicated the existence of the assistance but awareness is the main issue. Therefore, this sub-theme was associated with other themes such as '**Awareness**' (Section 5.6.6) and '**Support'** (Section 5.6.7).

5.5.4 Location

The fourth theme derived from the interviews is '**Location**'. This theme was developed from four sub-themes: '**move to safer place**', '**refuse to move'**, '**local business**' and '**risky area**'. According to **R4** and **R5**, many SMEs run their business on low land, near river basins and disaster prone areas. Usually the low land areas are exposed to disaster such as flood. Although **R2** suggested that these SMEs should move to a safer place, according to **R4** and **R7**, most of them refused to move to a safer place because they run their business locally, which means they get their resources locally and they market their products and services locally, as stated by **R2** and **R4**.

5.5.5 Mindset

The fifth theme is '**Mindset**' which resulted from sub-themes: difficult to change, can survive, not suitable for SME, not affect them and never learn. According to **R6**, it is difficult to change SMEs' perception and paradigm towards disaster management because they assume they might survive after the disaster hit (**R4**). **R4** also added that many SMEs assume that the business will not be affected by natural disaster. According to **R4, R5** and **R7**, many SMEs have experienced hit by

natural disasters but they never learn and never take necessary actions to avoid or at least to reduce the impact of the disaster. In addition, some SMEs assume that DRR programs available in Malaysia are only for big companies and not suitable for them (**R4**) and some of them are not interested in it.

5.5.6 Awareness

The sixth theme is '**Awareness**'. In this theme, four sub-themes were developed: '**no awareness'**, '**failed to recognize the risk**', '**create awareness**' and '**training**'. Awareness is important for everybody when dealing with disasters. **R2, R5, R6** and **R7** mentioned that some SMEs have no or low awareness regarding risks and disasters that might occur around them. **R2** also highlighted that some of these SMEs are not aware of the DRR programs and assistance available for them. Low awareness results in many SMEs failing to identify risks that might occur around them and their impacts, as stated by **R4** and **R5**. Therefore, it is important to create awareness in these SMEs, as suggested by **R2, R5** and **R7**. At the same time, **R2, R4** and **R6** suggested that awareness can be created through training by government agencies or private companies and high levels of awareness can develop preparedness for the SME. Thus, the sub-themes training is associated with other themes including '**Preparedness**' (Section 5.6.2) and '**Support**' which will be discussed next (Section 5.6.7).

5.5.7 Support

The final theme to identify the key issues that affect the disaster resilience of SMEs in Malaysia is '**Support**'. This theme was developed from two sub-themes: **'government support'** and '**private support**'. According to **R1, R2, R3, R6** and **R7**, government support is essential for SMEs for their resilience. **R1** highlighted some existing programs offered by the government such as grants, soft loans and emergency funds for affected SMEs. However, according to **R2**, many SMEs are

not aware of this financial assistance. **R2, R3, R6** and **R7** also suggested some programs be conducted by the government to ensure SMEs' resilience, including series of training, social insurance and immediate responses and relief for affected SMEs.

Meanwhile, **R1, R2, R3, R4** and **R6** highlighted the support from private companies. They suggested that private companies can offer support such as training, low insurance premiums, low interest loans and sharing their expertise with SMEs. In addition, **R1**, **R2**, and **R4** proposed activities such as providing training and expertise sharing can be done as part of their corporate social responsibilities (CSR) programs.

Therefore, there are many key issues that affect the disaster resilience of SMEs to natural hazards highlighted by the respondents. All of these key issues need special attention from related parties because it may bring bad impacts not only to the SMEs but also to the country. Figure 8 shows the relationship between all themes and sub-themes in assessing the key issues that affect the disaster resilience of SMEs to natural hazards.

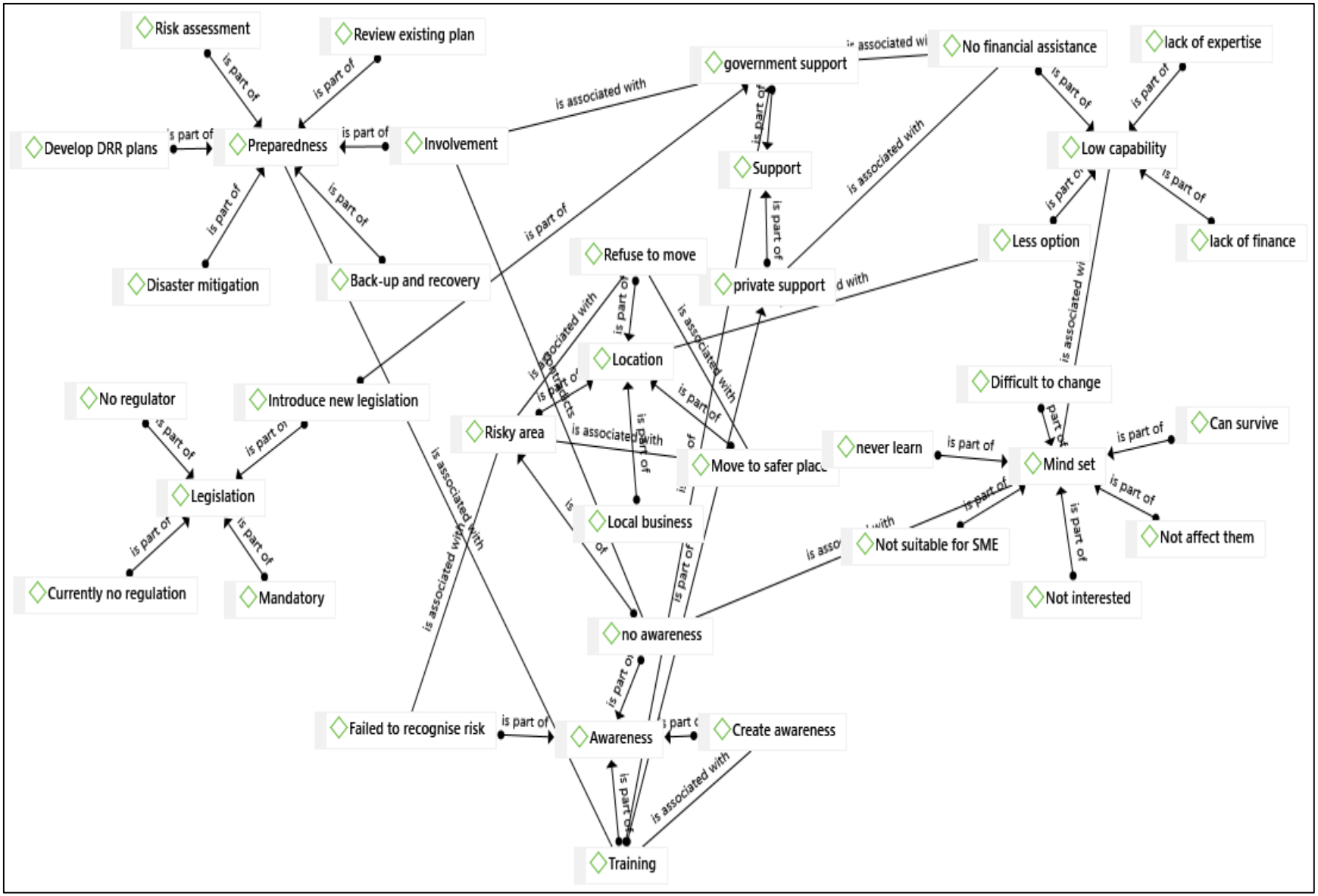

Figure 8: Relationship of themes in assessing the key issues that affect the disaster resilience of SMEs to natural hazards

5.6 Development of BCM framework for SMEs in Malaysia

The final part in this analysis is to acquire the respondents' view on the proposed conceptual framework (Figure 2) that is also stated as **RO5** of this research "*Develop and recommend a BCM framework as a DRR approach for SMEs in Malaysia.*" However, there is no detailed analysis for this part because the purpose of this section is to check the need for the proposed conceptual framework, novelty issue, and other elements that might influence the final conceptual framework.

Firstly, this research will check the availability of BCM framework for SMEs in Malaysia. Based on the interviews, **R2, R4, R6** and **R7** confirmed that there is currently no BCM framework available for SMEs in Malaysia. However, **R3** and **R5** were not sure about this because they are not familiar with SMEs in Malaysia. At the same time **R2, R4, R6** and **R7** highlighted a few BCM frameworks in Malaysia but according to them, these frameworks were developed for large companies, not for SMEs.

The respondents also underlined a few elements to be incorporated in the framework to make it achieve its objectives such as legislation issue, where **R6** mentioned the need for a legal requirement to ensure all SMEs can follow this framework. **R2, R4** and **R6** emphasized the affordability issue. According to them, SMEs have limited budgets so the implementation of this framework must lie within their budget. **R2** and **R6** gave additional views where they said the framework must be not complicated but be easy to be understood by SMEs. Finally, **R3** highlighted the awareness issues where he stated that after the framework was drafted, it is important to make sure all SMEs are aware of it. Table 14 summarizes the themes in developing and recommending a BCM framework as a DRR approach for SMEs in Malaysia.

Table 14: Themes in developing and recommending a BCM framework as a DRR approach for SMEs in Malaysia

Themes	Quotation	Source
No framework	*"I don't think so. Maybe there are a few private companies…I meant consultant companies those provided the guideline but I don't think this guideline is for SME……it is more suitable for larger companies."*	R2
	"…not come across any BCM framework or guideline for SMEs."	R4
	"I don't think so." *"I pretty sure there is no such thing in Malaysia."*	R6
	"But framework specifically for SME…..I don't think so…..maybe not."	R7
May has framework	*"For the BCM framework for SME….i'm not sure about that but I think there are a few organisations have it. Maybe you can check with international organisations such as UNDP….ADRC etc. I think the London government has some as well."*	R5
	"…maybe but I'm not familiar with them."	R3
Not for SME	*"…I don't think this guideline is for SME……it is more suitable for larger companies."*	R2
	"got BCM standard developed by SIRIM. It was quite some time ago….in 2008. Namely it called MS1970….it is Malaysian Standard which is code of practice. You can get certified….it just code of practice telling you the terminologies and all these thing on BCM. And also telling you what you need to do for BCM but nothing more than that."	R4
	"I don't think this standard is appropriate for SMEs in Malaysia."	R6
Legislation	*"…consider any legislation that currently available and can be used to support your framework."*	R6
Affordability	*"…the framework must within SME affordability…"*	R2
	"They don't have the budget or funding available. Or maybe they don't want to spend the money."	R4
	"…you need to make sure your framework meet the SMEs requirements in term of budget and their knowledge."	R6
Easy to understand	*"…not complicated or too technical. If you want to introduce the framework….make sure it is easy to understand by SME owners…"*	R2
	"If you propose something for SME that quite expensive to implement or something sophisticated…..believe me it wouldn't work."	R6
Awareness	*"So you have to manage those situations and use sensible approach and try to raise their awareness."*	R3

5.7 Summary and link

The impacts of natural hazards to the SMEs in Malaysia are bad. This issue has been discussed in this chapter. At the same time, based on the interviews, many themes have been developed to describe the roles of the stakeholders and the perceptions of SMEs in Malaysia toward the existing DRR programs in Malaysia. Finally, through the interviews, several key issues that determined the disaster resilience of SMEs in Malaysia are disclosed.

All the data from the interviews were analyzed using '*Thematic Analysis*' in order to identify the important themes for each research question. Then the themes were used to develop a discussion and solution for the research question. Finally, the interviews partially answered the research question of:

- How do natural hazards affect SMEs in Malaysia? (Section 5.2)
- What are the roles played by other parties in supporting SMEs to manage natural hazards in Malaysia? (Section 5.3)
- What are the perceptions of SMEs towards the existing DRR programs in Malaysia? (Sections 5.4), and
- What are the factors that determine the disaster resilience of SMEs to natural hazards? (Section 5.5)

All the research questions will be further investigated in the next chapter which will develop further analysis based on a survey distributed to the SME owners in Malaysia. Accordingly, the next chapter presents the discussion of findings of all quantitative data collected from the survey.

CHAPTER 6

QUANTITATIVE DATA ANALYSIS AND FINDINGS

6.1 Introduction

The purpose of this chapter is to present the results of the survey conducted for this research. This chapter is divided into five main parts. The first part regards the response rate of this survey. A brief explanation on how the data were gathered is explained in this section. In addition, this section compares the response rate for this research with other past research in a similar context (Section 6.2).

In the second part, the general information of the respondents is evaluated. This part is important in order to understand who are the respondents and also to ensure that all of these respondents are entitled to be called SMEs based on the SME definition provided by the SMECorp Malaysia (Section 6.3).

In the third part, the analysis will discover the natural hazard experiences among the respondents and will focus on the impacts of natural hazards to the respondents. The respondents were asked about their own experience of natural hazards and how the natural hazards affected their business (Section 6.5 and 6.6).

In the fourth part, the analysis will assess the respondents' perspectives on existing DRR programs in Malaysia. Analysis involved here includes their awareness on DRR programs in Malaysia, how they rate the assistance received from various bodies, and their perception of the existing DRR programs (Section 6.7 and 6.8). Finally, in Section 6.9, the analysis evaluates the aspects of business resilience and BCM among the respondents. In this section, the analysis considers actions taken and will be considering in the future by the respondents in dealing with natural hazards. The

analysis in this section also will discover the standpoint of the respondents in business resilience and BCM.

6.2 Population target and response rates

Before the research demonstrate the analyses, it is important for this research to assess the population and response rate of this survey. This aspect is significant in order to ensure the distributed questionnaire reached the population target and response received for the survey is good enough for data generalisation and theory development.

Defining the population was the first step in selecting the target population and sampling frame. The population chosen comprised of all SMEs in Malaysia. Large firms were omitted because this study focuses on relevant issues which closely target SMEs. In addition, annual revenue and number of employee were factors considered in selecting the target population to ensure the selected SMEs fulfilled the definition of SME provided by the Malaysia SMECorp in 2013 (See Section 2.3.2).

However, to select all SMEs in Malaysia for this research was quite impossible because not all SMEs are registered with any regulatory body. There is no regulation for SMEs in Malaysia to register with any government agency or association. Therefore, it is difficult to know the exact number of SMEs in Malaysia. To overcome this problem, this research used SMEs database provided by the SMECorp and this database consists of SMEs from various sectors in all states in Malaysia.

A total of 1223 questionnaires were distributed to SMEs in the whole country for this research. The questionnaire was distributed online direct to the email address provided on the SMECorp website. On the website, the SMECorp has established a database for SMEs in Malaysia. The

database contains information on the SMEs based on their sector, for every state in Malaysia. However, according to the SMECorp, their database only consists of the details of SMEs that come and do business with them, such as business advisory and asking for financial assistance.

All the respondents were given up to two months to complete the survey and five courtesy reminders by emails and phone calls were made up. As a result, 139 responses were received which indicated 11.37 percent of the number of the distributed questionnaires. However, from the 139 responses, 12 responses were excluded because the respondents did not complete the questionnaire, which made 127 (10.38%) acceptable responses to be analysed for this research.

The response of 10.38 percent is just enough to achieve the minimum target response for this research which is 10 percent. The target of 10 percent was made based on the nature of online surveys to which it is difficult to get a huge response. In addition, the nature of respondents is another issue to be considered in making the target because, according to Boocock and Shariff (2005), the low response rate among Malaysian SMEs is closely associated with the mixed-race, multilingual nature of Malaysian society. In addition, Jusoh, Nasir Ibrahim and Zainuddin (2008) stated that the Malaysian managers are typically reluctant to participate in mail surveys, and the sensitive and confidential nature of the information requested may contribute to the overall low response rates. A study by Mohamed Zabri (2013) shows at least three surveys which used SMEs in Malaysia as respondents got less than 10 percent response rate.

6.3 General Information of the respondents

This section provides analysis of the respondents and their organisations. This includes the position of the respondent, the industry sector in which the business operates, number of people employed, annual turnover, types of organisation and status of the business premises. The reasons for these general assessments are (1) to ensure the survey was answered by the targeted respondents; the

person who has authority in the organisations, and (2) to confirm that the organisations surveyed are SMEs as defined by the SMECorp Malaysia.

More than 90 percent of the responses received were answered by the person who has authority in the organisation. They include business owners, Chief Executive Officers (CEOs), Managing Directors, General Managers and Chief Financial Officers. This figure shows that this survey reached the targeted person who has knowledge of the organisation affairs and strategic plans. The details of the respondents who answered the survey are illustrated in Table 15 and Figure 9 below.

Table 15: Respondent position (n = 127)

Position	Frequency	Percentage
Business Owner	48	37.80
Chief Executive Officer	3	2.36
Chief Financial Officer	2	1.57
Managing Director	18	14.17
General / Senior Manager	45	35.43
Head Financial Reporting	1	0.79
Business Consultant	2	1.57
Accountant	2	1.57
Contractor	1	0.79
Marketing Executive	1	0.79
General worker / admin	4	3.15
Total	127	100

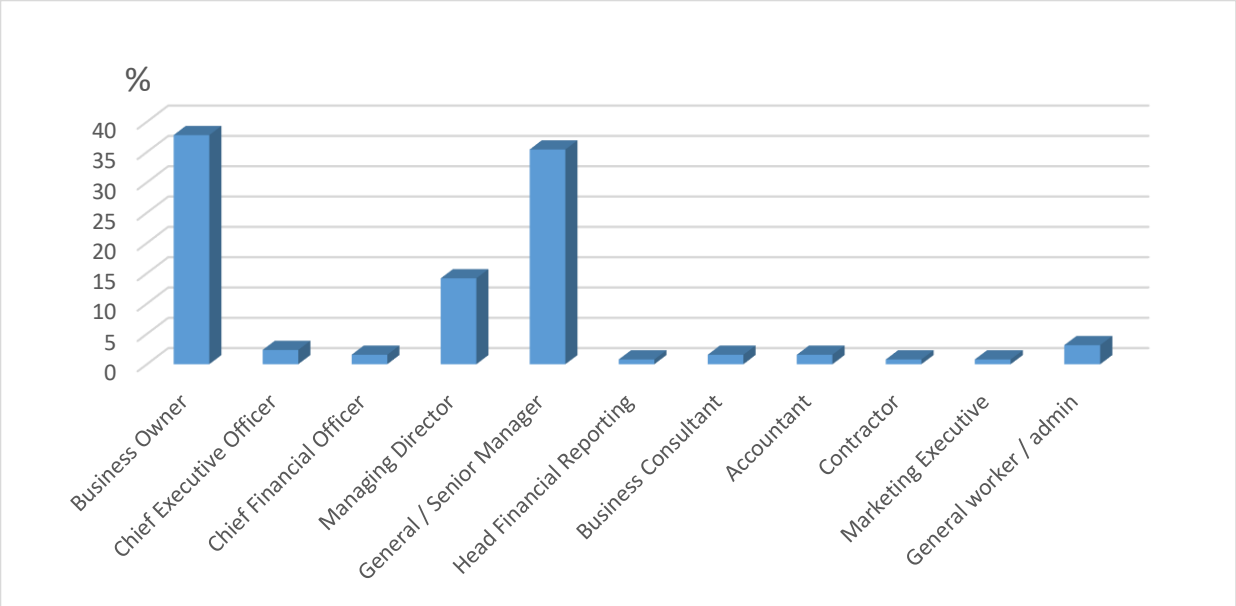

Figure 9: Respondent positions (n = 127)

The analysis of the gathered data is then to check the frequency of the industry sector in which respondents are categorised. Twelve categories of industry sector were proposed for respondents to choose from. If their industry sector was not listed, they could opt for '*other*' option. The result for this question is shown in Figure 10.

Based on Figure 10, the respondents of this research came from various SMEs' industry. 28.35 percent of the respondents opted '*other*' as the industry sector. These include security managements, employment agencies and manpower supply, rural management, caterers and food providers, ICT consultants, event management, bakery and automobile services (repair, services and painting). However, based on Figure 10, it is difficult to identify if all the respondents can really be categorised as SME as defined by the SMECorp Malaysia in Section 2.3.1.

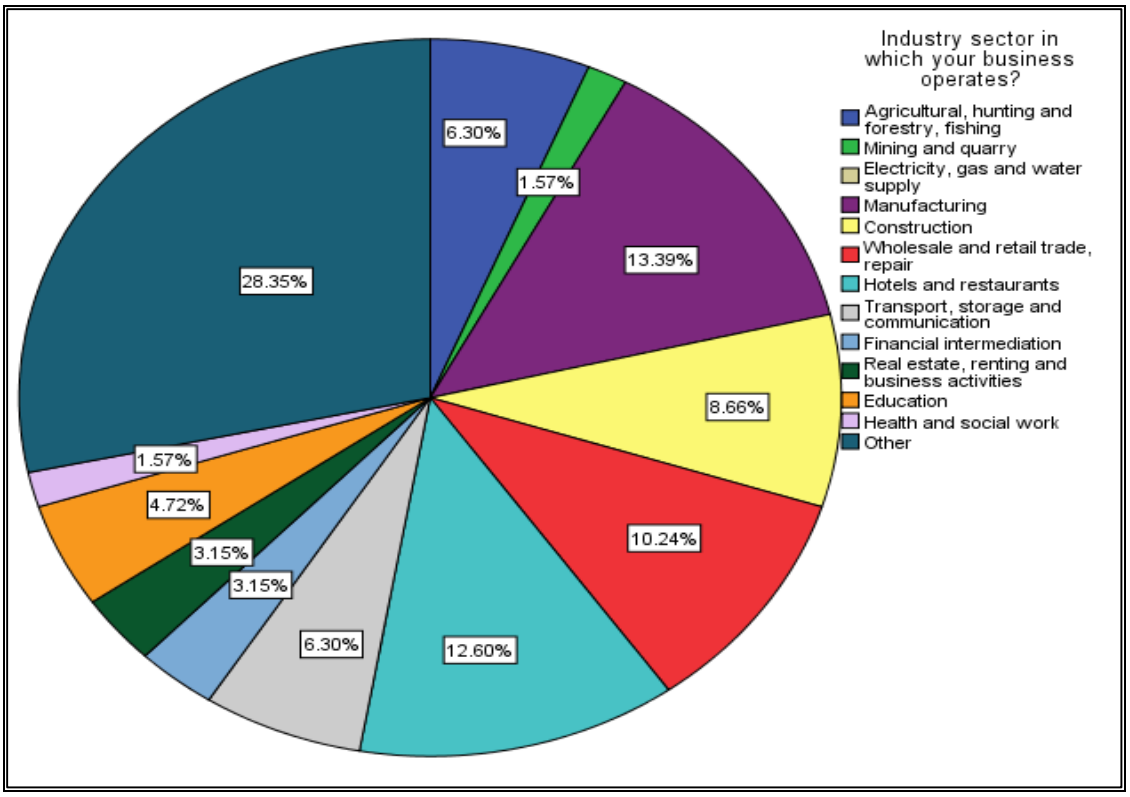

Figure 10: Industry sector in which the respondent's business operates (n = 127)

Therefore, the number of employees and annual turnover are shown in the *cross tabulation* (crosstab) Table 16 below. Five categories of number of employees and annual turnover were identified in order to certify that they comply with the definition of SME provided by the SMECorp Malaysia. The category of number of employees are: 0 (sole trader); 1 – 9 employees; 10 – 75 employees; 76 – 200 employees; and over 200 employees. The annual turnover was grouped as less than RM500,000; RM500,001 – RM20,000,000; RM20,000,000 – RM50,000,000; and over RM50,000,000.

Table 16: No of employee * Annual turnover crosstabulation (n = 127)

			Annual turnover				
			Less than RM500,000	RM500,001 - RM20,000,000	RM20,000,001 - RM50,000,000	Over RM50,000,000	Total
No of employee	0 (sole trader)	% within No of employee	85.7%	14.3%			100.0%
		% within Annual turnover	11.8%	2.0%			5.5%
		% of Total	4.7%	0.8%			5.5%
	1 - 9	% within No of employee	66.7%	33.3%			100.0%
		% within Annual turnover	82.4%	41.2%			49.6%
		% of Total	33.1%	16.5%			49.6%
	10 - 75	% within No of employee	8.6%	71.4%	14.3%	5.7%	100.0%
		% within Annual turnover	5.9%	49.0%	25.0%	40.0%	27.6%
		% of Total	2.4%	19.7%	3.9%	1.6%	27.6%
	76 - 200	% within No of employee		26.7%	60.0%	13.3%	100.0%
		% within Annual turnover		7.8%	45.0%	40.0%	11.8%
		% of Total		3.1%	7.1%	1.6%	11.8%
	Over 200	% within No of employee			85.7%	14.3%	100.0%
		% within Annual turnover			30.0%	20.0%	5.5%
		% of Total			4.7%	0.8%	5.5%
Total		% within No of employee	40.2%	40.2%	15.7%	3.9%	100.0%
		% within Annual turnover	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	40.2%	40.2%	15.7%	3.9%	100.0%

From Table 16 above, the majority (96.1%) of the respondents have fewer than 200 employees and they can be categorised as SME based on the definition provided by the SMECorp Malaysia. The remaining 3.9 percent can also be categorised as SME although they employ more than 200 employees because another element to be considered as SME is based on the business's annual turnover and all these businesses generated annual turnover between RM500,000 to RM50,000,000.

Out of the 127 respondents, almost all of them run their business as a company and sole trader, while almost two thirds (2/3) of the respondents rent premises for their business. The details of the type of organisation and status of business premises are shown in Figure 11 and Figure 12 respectively.

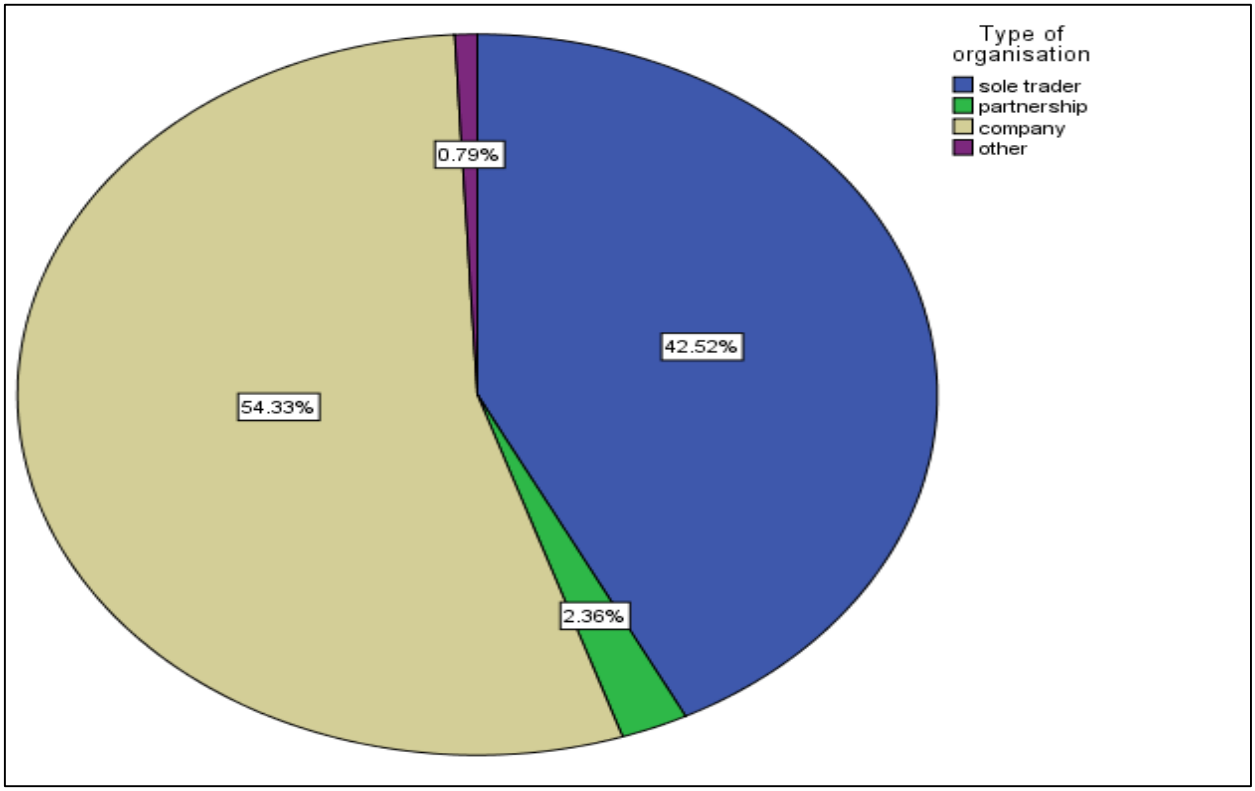

Figure 11: Types of organization (n = 127)

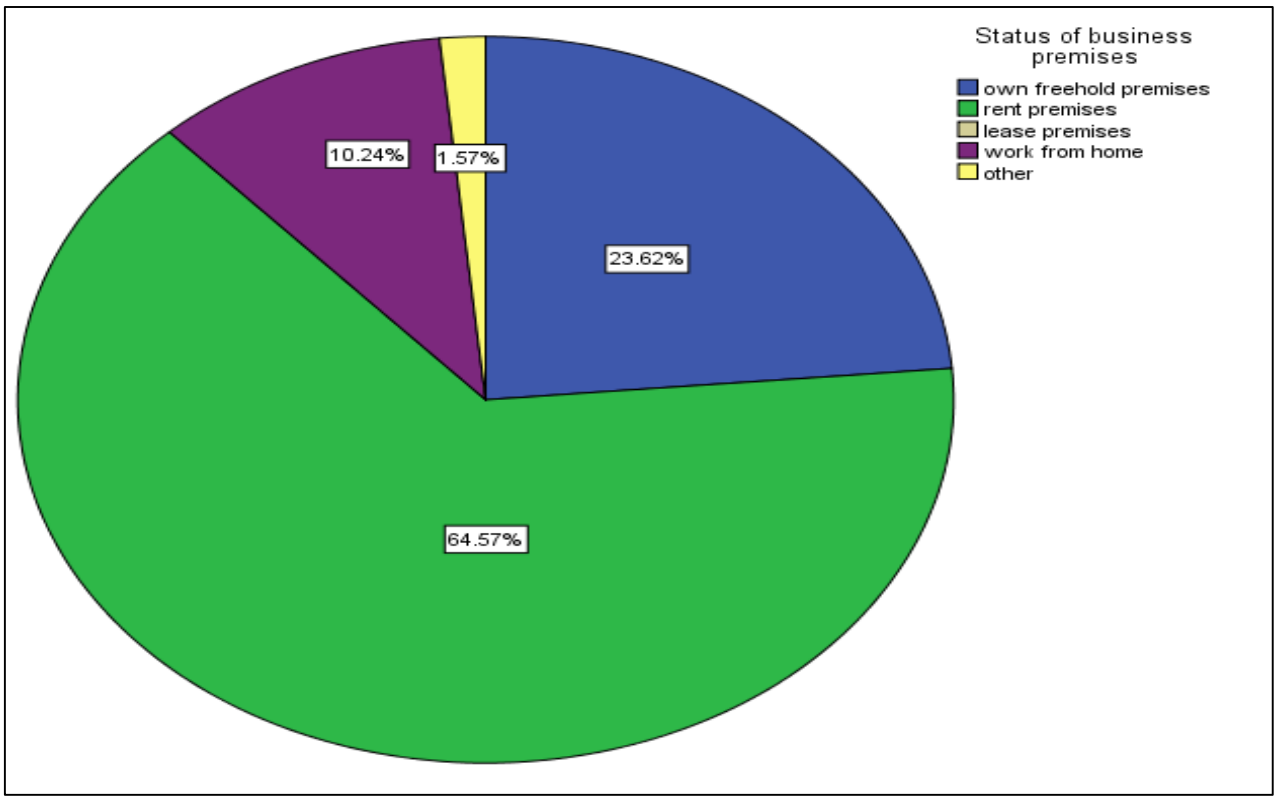

Figure 12: Status of business premises (n = 127)

6.4 Reliability test

Before any further quantitative analysis can be done, it is important to check the reliability of all statements, also known as items. According to Allen et al. (2014), reliability refers to the consistency or dependability of a measure over time, over questionnaire items, or over observers/raters. Two measurement approaches that can be used to check reliability are *Cronbach's alpha* and *Cohen's kappa*. For the purpose of this research, *Cronbach's alpha* is used because it can measure the internal consistency and it is used to assess the extent to which a set of questionnaire items tapping a single underlying construct covary (Allen et al., 2014).

Cronbach's alpha for the 16 items of business resilience and BCM questionnaire was .915. This means the items have high consistency for research purposes (> .7). The questionnaire item-total

statistics indicated that alpha would increase to .918 if item 16 were removed. Item 16 asked whether government should establish a BCM framework for SMEs and the answer for this item is highly predictable. However, since there was no significant difference in the alpha if item 16 is moved, all items in this part will be used for further analysis.

6.5 Natural hazard experience

Based on the survey conducted, 44.1 percent of the respondents have experience of being hit by natural hazards between 2011–2016 (the survey was conducted in April–June 2016). Out of this figure, most of the respondents were hit by floods - the Great Flood 2015, the heat waves in 2016 and the haze in 2015. Table 17 shows the statistics of the SMEs affected by natural hazards in 2011–2016.

The data shown in Table 17 suggests that 2016 was the most affected year where many natural hazards occurred in the year in terms of frequency. The most affected natural hazard is heat wave which hit the whole of Malaysia in 2016, where 24 SMEs were affected by this. However, this disaster only occurs occasionally compared to flood which affects SMEs every year.

Table 17: Number of SMEs affected by natural hazards in Malaysia (2011 - 2016) (n = 56)

Type of disaster	Year					
	2011	**2012**	**2013**	**2014**	**2015**	**2016**
Floods	2 (3.6%)	3(5.4%)	4 (7.1%)	5 (8.9%)	7 (12.5%)	3 (5.4%)
Storms / hurricanes	-	-	-	1 (1.8%)	1 (1.8%)	3 (5.4%)
Heat waves	-	-	-	-	-	24 (42.9%)
Haze	-	-	-	-	21 (37.5%)	-
Landslides	-	-	1 (1.8%)	-	-	-
Drought	-	-	-	-	-	17 (30.4%)
Other	-	-	1 (1.8%)	-	2 (3.6%)	-

6.6 Impacts of natural hazard to SMEs

A *descriptive statistics analysis* was conducted in order to determine which natural hazards most affect the respondents based on the mean of each disaster indicated by the respondents. The analysis was started by selecting only the SMEs affected by natural hazards as selected cases. In this survey, 56 respondents (44.1%) had experience of being hit by natural hazards. The selected respondents were then asked whether their business was affected by any natural hazard during last five years. Based on the literature review in Section 3.4, six natural hazards were proposed to the respondents and these six natural hazards were the most commonly occurring and affecting hazards in Malaysia. In addition, the respondents were also given an option to state other natural hazards if their businesses had been hit by other types of natural hazards. Five options of Likert Scale were given for the respondents to describe the effect of the proposed natural hazards to their business. The given options were "*very much affected*" which labelled as "5"; "*much affected*"=4; "*somewhat affected*"=3; "*affected a little*"=2; and "*not affected at all*"=1.

Descriptive statistics analysis was run and the result shows that flood is the most affected natural hazards with *mean* of 3.88 which indicated flood is the most affected disaster compared to others. This result is predictable and tallies with previous studies in Section 3.3 which stated that floods are the main natural hazard in Malaysia. Figure 13 shows the *mean score* of each natural hazard. In the responses received, there were four SMEs that chose "*other*" disaster and they stated these as political risks, drop of commodities prices and fluctuation of oil price. However, these risks cannot be considered in this research because they are not natural hazards.

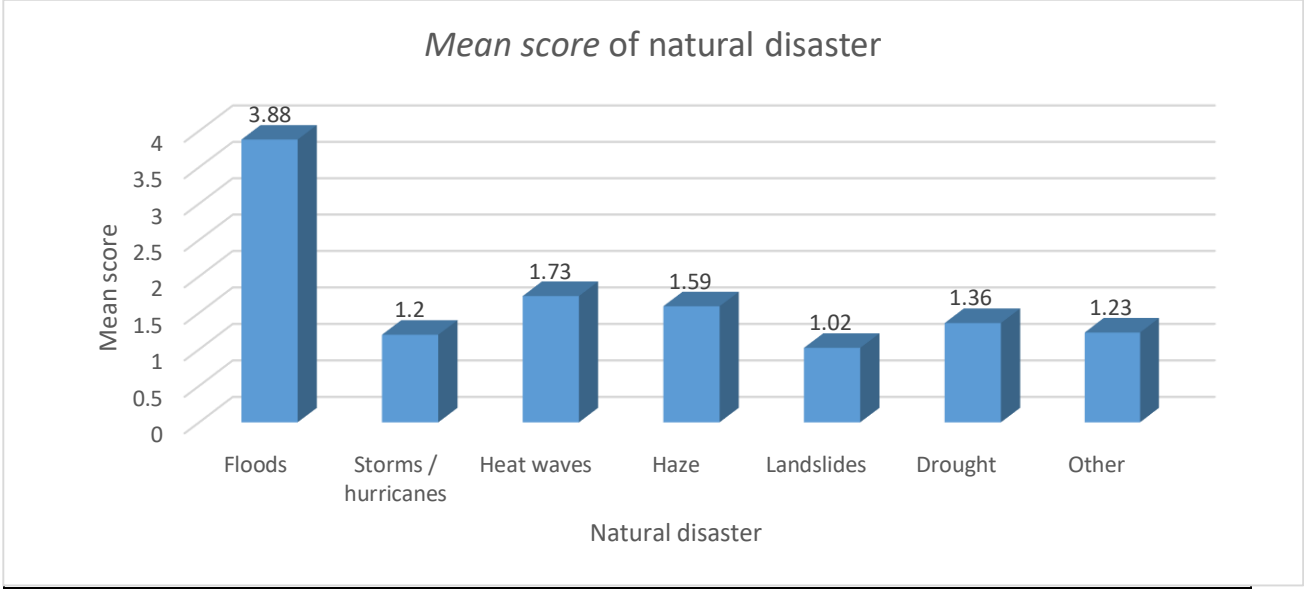

Figure 13: *Mean score* of natural hazards affecting the surveyed SMEs (n = 56)

The questionnaire also asked the respondents the impacts of natural hazard to their business. 17 positive and negative impacts were proposed as options for them to choose and the result shows that the loss of sales, non-attendance of employees and damage to property are the top three impacts identified among respondents. The details of the impacts to the SMEs surveyed are shown in Figure 14. Figure 14 also suggests positive impacts of natural hazard are very small or almost do not exist among the respondents.

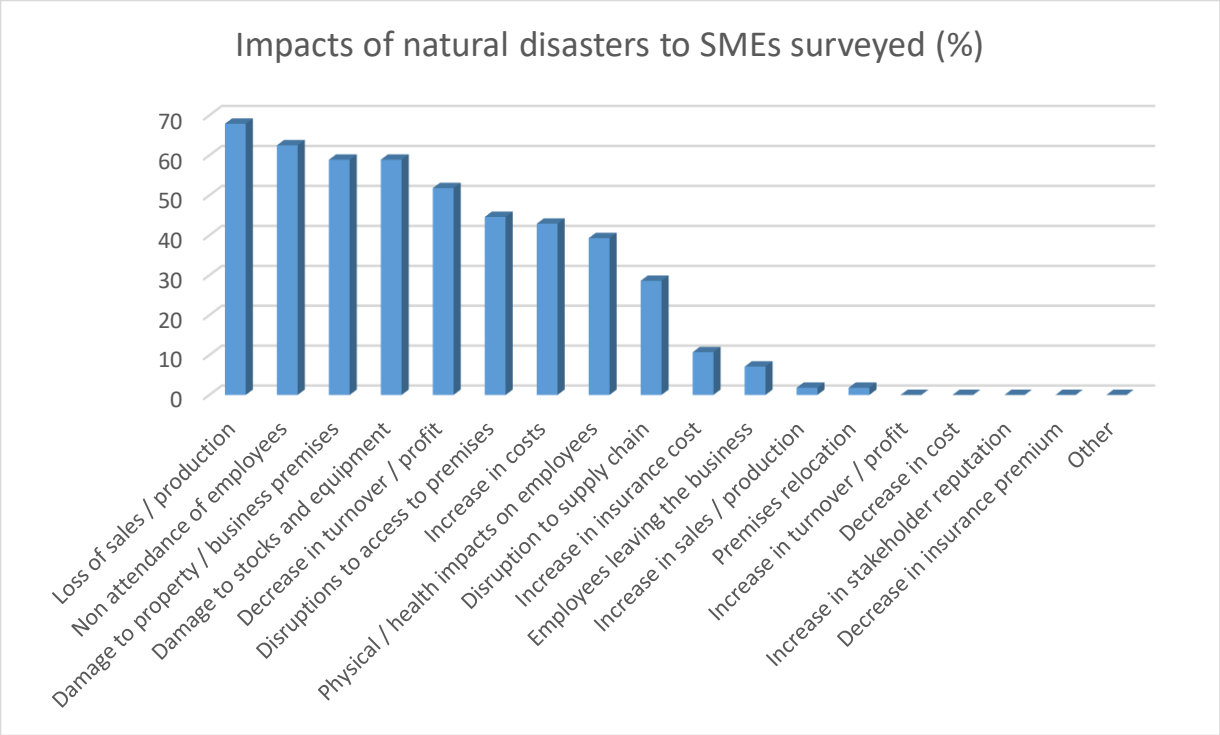

Figure 14: Impacts of natural hazards to SMEs (n = 56)

The respondents were also asked about their business's experience of natural hazards. All the affected respondents were required to rate statements concerning the impact of natural hazard, their awareness and warning received prior to the natural hazards. All these statements should be rated as *strongly agree* (weighting as 5); *agree* (weighting as 4); *don't know* (weighting as 3); *disagree* (weighting as 2); and *strongly disagree* (weighting 1). The *mean score* for each statement is shown in Table 18 below.

Based on Table 18, many respondents claimed that the impacts of the natural hazard were very bad for their business. *Mean score* 4.06 shows that the majority of the affected respondents agree with the statement. In addition, 14 of the affected respondents strongly agree with the statement. The *mean score* for the second statement is also quite significant to conclude that the affected respondents are aware of the natural hazards occurring around them. However, for the third and fourth statements, a drastic drop in terms of the number of responses that strongly agree with the

statement can be seen from Table 18. Even though no specific reason was asked for this pattern, the role of mass media is believed to be an essential cause for this (Backfried, Schmidt, & Quirchmayr, 2015; Dufty, 2015). The final statement about sufficient lead time received is the only statement where respondents strongly disagree. The *mean score* for the statement is also less than 3 which indicates that many of the affected respondents were not sure or disagreed that they were given sufficient time to take any necessary action after receiving information or warning about natural hazards that might affect them. This situation shows the weakness of authority bodies in the affected area and in Malaysia generally in delivering important information.

Table 18: *Mean score* for the respondents' business experience of natural hazards

Statement	No of responses with highest weight	No of responses with lowest weight	*Mean* weight
The impact of the natural disaster was very bad to my business	14	-	4.06
My business was aware of a natural disaster occurring in the locality	5	-	3.75
Adequate information / warning was received prior to the occurrence of the natural disaster	1	-	3.19
Sufficient lead time was available to take action upon receiving information / warning	-	2	2.89

6.7 Disaster risk reduction programs in Malaysia

As stated before in previous section, 56 of the surveyed respondents were hit by natural hazards. Out of this number, only 15 (26.8%) respondents received any assistance or support from any party to recover from its effects and continue their operation. Half of the affected respondents did not receive any assistance while 12 (21.4%) of them did not require any assistance because the impacts were not significant enough for them and they can mitigate the impacts themselves.

From the number of surveyed respondents that were hit by natural disasters, less than half were aware of the existence of any disaster risk reduction programs in Malaysia. Figure 15 shows the

proposition of the awareness of SMEs on DRR programs in Malaysia. Lack of awareness among SMEs is another issue to be tackled by the decision makers in Malaysia. This issue will influence the assistance and support received by SMEs as part of DRR programs which will be discussed later.

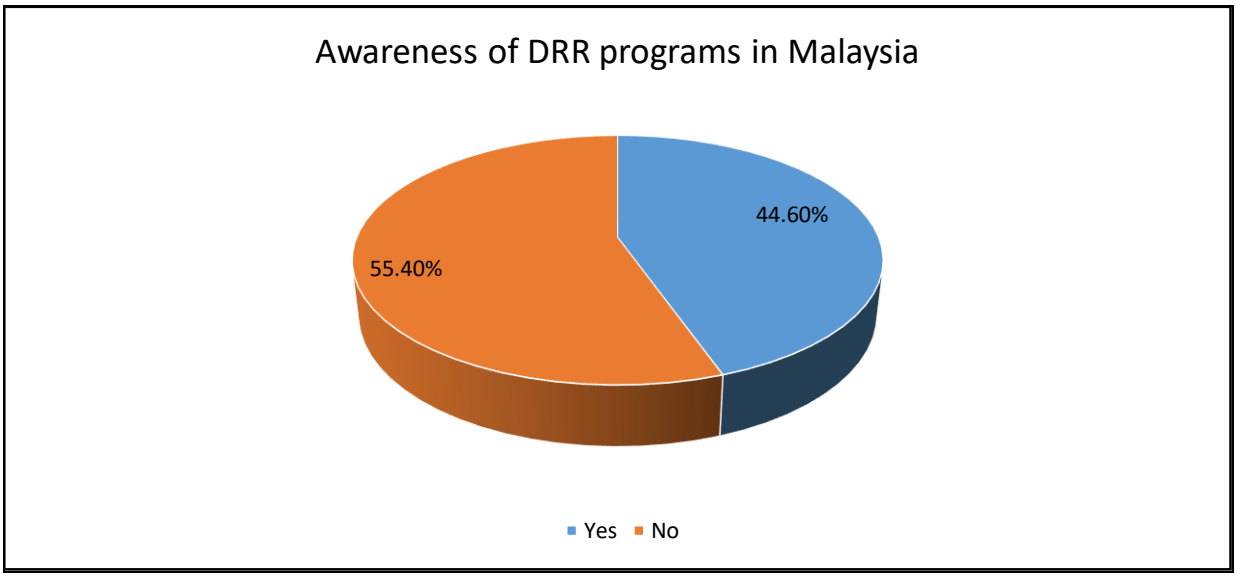

Figure 15: Awareness of DRR programs among affected SMEs in Malaysia (n = 56)

Based on the number of respondents that did not receive any assistance or support, it is a clear indicator to encourage related bodies to work harder in service delivery. There are many reasons behind this scenario, such as information provided by related bodies did not reached its target, lack of information on the assistance provided, information provided is too complicated for SMEs or maybe the affordability issue.

For the business owners those received assistance and support before, there were a few respondents that received assistance from more than one source. Table 18 shows the source of assistance/support received by those SMEs.

The results shown in Table 19 indicate that the main source of assistance received by SMEs was obtained from the government agencies and financial companies. There are only two cases where

the respondents received assistance from non-government agencies (NGOs). This shows that NGOs do not play significant roles during disaster hits in the context of DRR. This result is important because it will significantly influence the conceptual framework of this research which will be discussed later in Section 7.6.

Table 19: Source of assistance / support (n = 16)

Source	Frequency
Government agency	11
Politicians	0
Local authority	1
Financial company	6
Emergency services	0
Local utility companies	0
Environment agency	0
Trade association or other business network	0
Supply chain members / customers	0
Neighbouring businesses	0
Neighbouring households	0
Family and relatives	4
Non-government organisation (NGO)	2
Other	0

As stated in previous section, 56 respondents declared that they were hit by natural disasters in the last five years. However, from the survey conducted, only 16 SMEs stated that they received assistance or support for them to continue their business operations. This means only 28.6 percent received assistance while more that 70 percent of the affected SMEs did not receive any assistance or support and did not participate in DRR programs in Malaysia.

The respondents those received assistance or participated in DRR programs in Malaysia were asked to rate the assistance they received based on the Likert Scale "*5 = strongly satisfied*"; "*4 =*

satisfied"; "*3 = don't know*"; "*2 = dissatisfied*"; and "*1 = strongly dissatisfied*". The purpose of this weightage is to identify SMEs' perception of existing DRR programmes in Malaysia.

The results suggested that the majority of the related respondents were satisfied with assistance and support they received from government agencies, local authorities, family and relatives and from NGOs. However, more that 60 percent of the affected SMEs felt that assistance received from financial companies in Malaysia did not meet their expectations.

In order to assess the respondents' perspective on existing DRR programs in Malaysia, the respondents were asked whether they were aware of any DRR programs for SMEs in Malaysia. Out of 127 respondents, 49 (38.6%) were aware of the existence of DRR programs for SMEs in Malaysia, while 76 (59.8%) were not aware. There were two (1.6%) respondents who did not answer this question. Figure 16 illustrates the proposition of the awareness of DRR programs in Malaysia. In order to deal with the missing value, expectation maximization (EM) which is available within missing value analysis, is done to get the substitute value for the missing value.

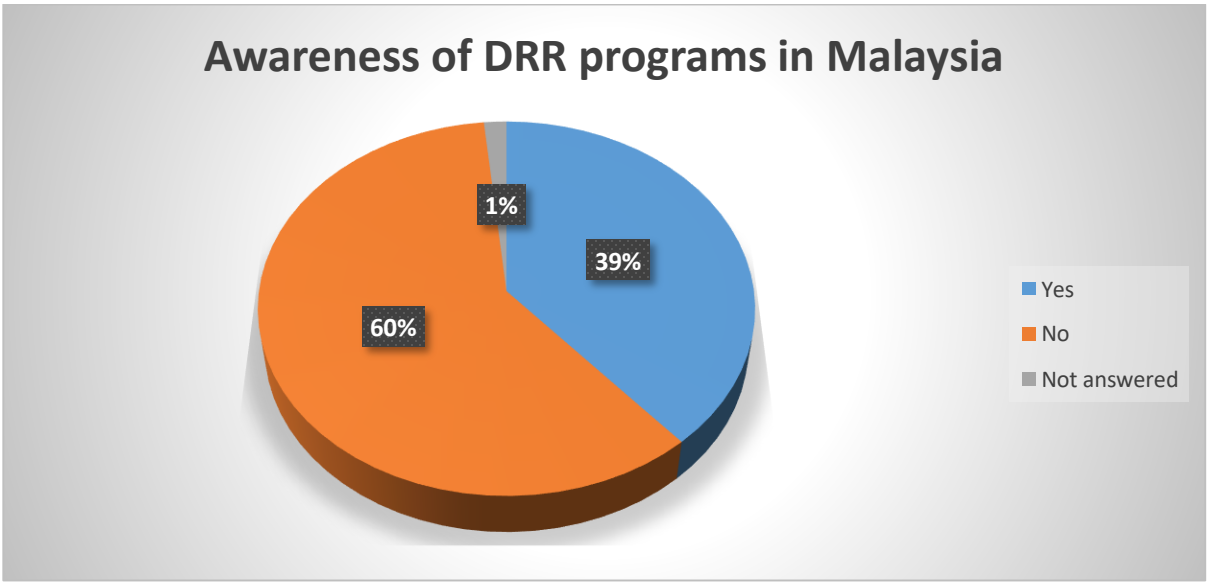

Figure 16: Awareness of DRR programs in Malaysia (n = 127)

Respondents who were aware of DRR programs in Malaysia (n = 49) were required to rate a few statements in order to assess their perception on this topic. The rate suggested to them is based on the following Likert Scale; "*5 = strongly agree*"; "*4 = agree*"; "*3 = don't know*"; "*2 = disagree*"; and "*1 = strongly disagree*". The result of these statements is presented in the frequency Table 20 below and, once again, any missing value is substituted using the expectation maximization (EM) approach.

Based on Table 20, 49 respondents were aware of the existence of DRR programs in Malaysia but from this number, only half of them participated in DRR programs. The majority of them agreed that DRR programs in Malaysia are suitable for SMEs and many of them also agreed that DRR programs in Malaysia are important in assisting SMEs dealing with disasters. Even though the majority of the surveyed SMEs agreed on the suitability and importance of DRR programs in Malaysia, the main question is why half of them do not participate in such programs. In order to assess both suitability and importance are the major factors that influenced their decision to participate, bivariate correlation analysis has been done. *Bivariate analysis (Pearson's correlation)* is used because, according to Allen et al. (2014), this correlation should be used to measure the linear association between two continuous variables.

Table 20: Results for each statement in relation to the DRR programs in Malaysia (n = 49)

Statement	Frequency				
	Strongly agree	**Agree**	**Don't know**	**Disagree**	**Strongly disagree**
My business participated in any DRR programs in Malaysia	-	25	4	20	-
DRR programs in Malaysia are suitable for SME	1	29	16	3	-
DRR programs in Malaysia are important in assisting SME dealing with disasters	-	37	11	1	-
DRR programs in Malaysia help me a lot after my business was hit by disaster	-	13	19	17	-

Besides the government, private sector also has conducting DRR programs	1	43	5	-	-

Before the *Pearson's* correlation can be done, it is important to run (1) *the test of normality*, and (2) *linearity and homoscedasticity* check, in order to ensure the normality assumption is not violated. The results of the test of normality show that the *Shapiro-Wilk statistic (W)* for suitability and importance are 0.807 and 0.623 respectively. Since both *W value* are more than 0.05, it suggests that the normality assumption is not violated, *bivariate correlation* (*Pearson's r*) can be done for these variables. The *linearity and homoscedasticity* check suggests that all variables have linear relationships with each other, so it will be adequately captured and summarised by *Pearson's r*.

The first correlation to be analysed is to check whether the suitability of DRR programs in Malaysia is the factor for the surveyed SMEs to participate in the programs. The result of the correlation is summarised in Table 21 below. In the result, the *Pearson Correlation* (*r*) = .525; *N* = 49 and *Sig*. (2-tailed) = .000. Since the *r* value > .05, the correlation is significant and it suggests that suitability of the DRR programs for SMEs is the factor that influenced their decision either to participate or not.

Table 21: Correlation between suitability and participation in DRR programs (n = 49)

Correlations

		participated in DRR programs	DRR programs suitable for SME
participated in DRR programs	Pearson Correlation	1	.525**
	Sig. (2-tailed)		.000
	N	49	49
DRR programs suitable for SME	Pearson Correlation	.525**	1
	Sig. (2-tailed)	.000	
	N	49	49

**. Correlation is significant at the 0.01 level (2-tailed).

The second correlation to be analysed is to assess the importance of DRR programs in Malaysia as a factor for SMEs to participate in the programs. The result of the analysis is presented in Table 22 below which shows that the r = .557, N = 49 and *Sig.* (2 –tailed) = .000. The result indicates that both variables are significant because r > .05 which can be interpreted that many surveyed SMEs participated in DRR programs in Malaysia because they felt that the programs are important is assisting them dealing with natural disasters.

However, when the surveyed SMEs were asked whether the DRR programs in Malaysia help them after their business was hit by natural hazards, only 26.5 percent of them agreed with it. Therefore, it is important for this research to identify why almost three quarters of the respondents chose to disagree or state "*don't know*" for this statement. A *cross tabulation* analysis was conducted in order to identify who agreed and disagreed with this statement. The finding of the *cross tabulation* analysis suggests that only 3 (5.36%)[8] of the affected SMEs agreed that the DRR programs in Malaysia help their business after being hit by disasters. The *Chi-Square Test* indicates that the *Pearson's Chi Square* = 11.400[9] which meant that the SMEs' disaster experience is significant in identifying whether the DRR programs in Malaysia help them after their business was hit by disasters. This result shows that more than 90 percent of SMEs hit by disasters felt that the existing DRR programs in Malaysia did not help them. Therefore, the result suggests that government and other related parties need to improve the existing DRR programs in Malaysia so that it can fit the SME requirements.

[8] N = 56 (number of respondent affected by natural disaster)
[9] Pearson Chi-Square *df* = 2; Pearson Chi-Square Asymp. Sig (2-sided) = .003

Table 22: Correlation between the importance of DRR programs and SMEs' participation (n = 49)

Correlations

		participated in DRR programs	DRR programs are important in assisting SME dealing with disasters
participated in DRR programs	Pearson Correlation	1	.557**
	Sig. (2-tailed)		.000
	N	49	49
DRR programs are important in assisting SME dealing with disasters	Pearson Correlation	.557**	1
	Sig. (2-tailed)	.000	
	N	49	49

**. Correlation is significant at the 0.01 level (2-tailed).

In order to investigate more detail on this issue, a descriptive statistics analysis has been conducted to identify the frequency of the respondents who felt the DRR programs did not help their business after being hit by disaster, and features of the program. Five features of the DRR programs had been proposed to the surveyed SMEs and they are: (1) too costly; (2) lack of expertise; (3) lack of information; (4) information available is too complicated; and (5) protection measures are too complicated. The result suggests that more than half of the surveyed respondents agreed DRR programs in Malaysia are costly, complicated and not understandable[10]. Because of these problems, the affected SMEs did not participate in the DRR programs and felt that the programs were not useful for them.

6.8 Existing strategies taken by SME

SMEs' responses to their existing strategies taken in dealing with natural hazard suggest that almost half of them did not consider any risk by not taking any action. Figure 17 shows the existing

[10] Results show that feature 1, 2, 3 and 4 are significance.

coping strategies used by the affected SMEs. This result is predictable based on Section 2.2.3, lack of financial sources and expertise are the major problems faced by SMEs in making any decision.

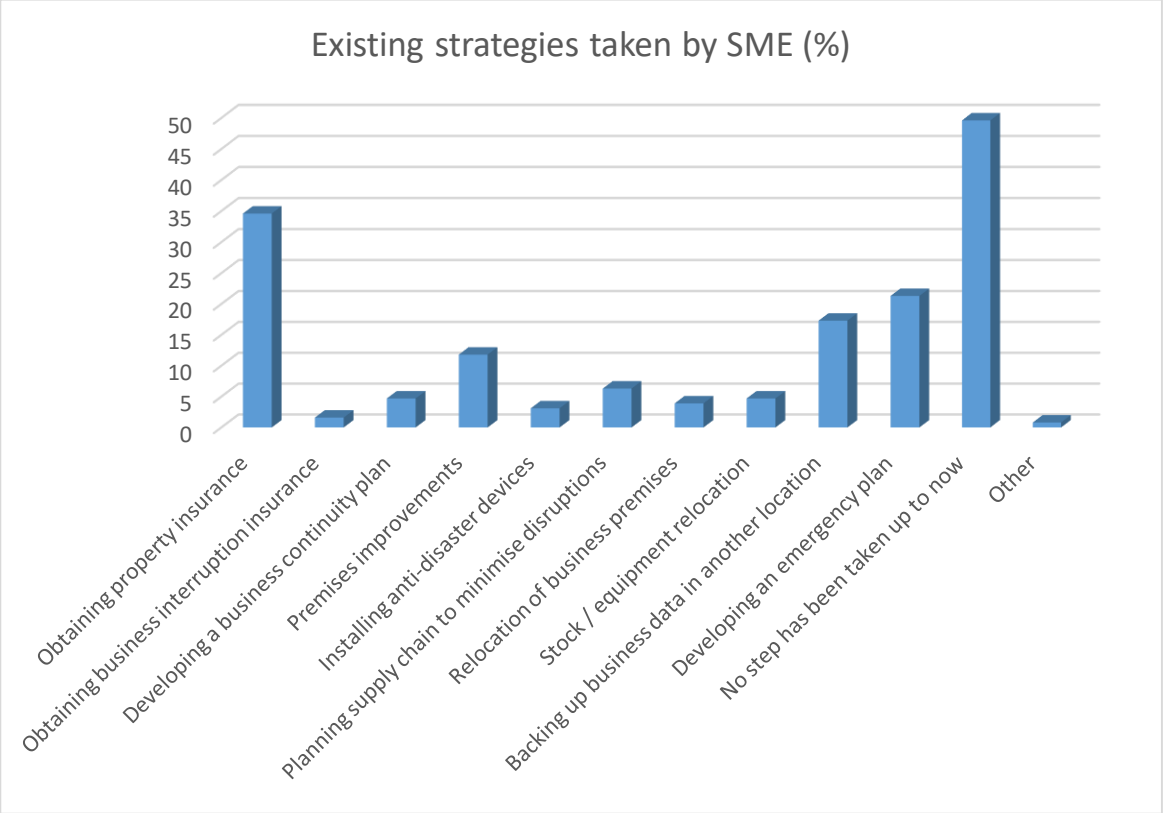

Figure 17: Existing strategies taken by SMEs (n = 127)

Figure 17 also suggests that more than 30 percent of the respondents have obtained property insurance. Property insurance is compulsory for all business premises in Malaysia, therefore the response rate for this option should be higher that what is shown in Figure 17. However, although property insurance in Malaysia is compulsory, the standard policy does not cover natural disasters (Jasimin & Ali, 2014; Khanal, 2007). Usually natural disasters coverage can be obtained by paying an additional premium which is quite expensive and not affordable for most SMEs.

Another interesting issue to be highlighted in Figure 17 is the development of business continuity plan (BCP) among the SMEs. From the data provided, less than 5 percent of the respondents have

already developed the BCP. The data gathered also suggest that currently, only medium sized companies with high annual turnover have already developed the BCP.

Previous studies on BCM also suggested that BCM is highly correlated with IT issues (see Section 2.3.3). One of the strategies recommended in these studies is backing up business data. However, in the case of SMEs in Malaysia, only 15 percent of the respondents are already backing up their business data. This means that BCM does not get enough attention from SMEs in Malaysia.

The respondents were also asked about the future strategies they may consider for implementation to address the risk of natural hazard. Once again, as stated in Figure 18, more than 50 percent of the respondents may not consider any action in the future. The main reason for this as stated in Figure 19 is the SMEs did not see any natural disaster affecting their business in future. However, there is no significant difference between this reason and other reasons because the number of responses for each reason is not much diverse.

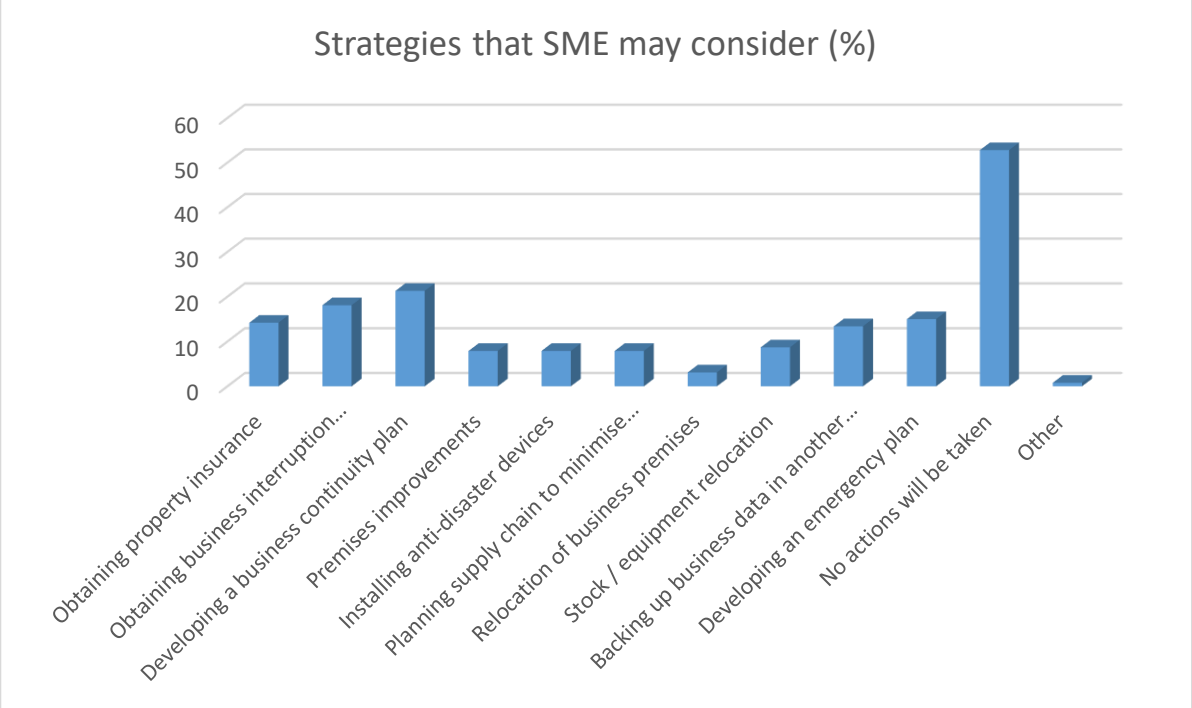

Figure 18: Strategies that SMEs may consider in the future (n = 127)

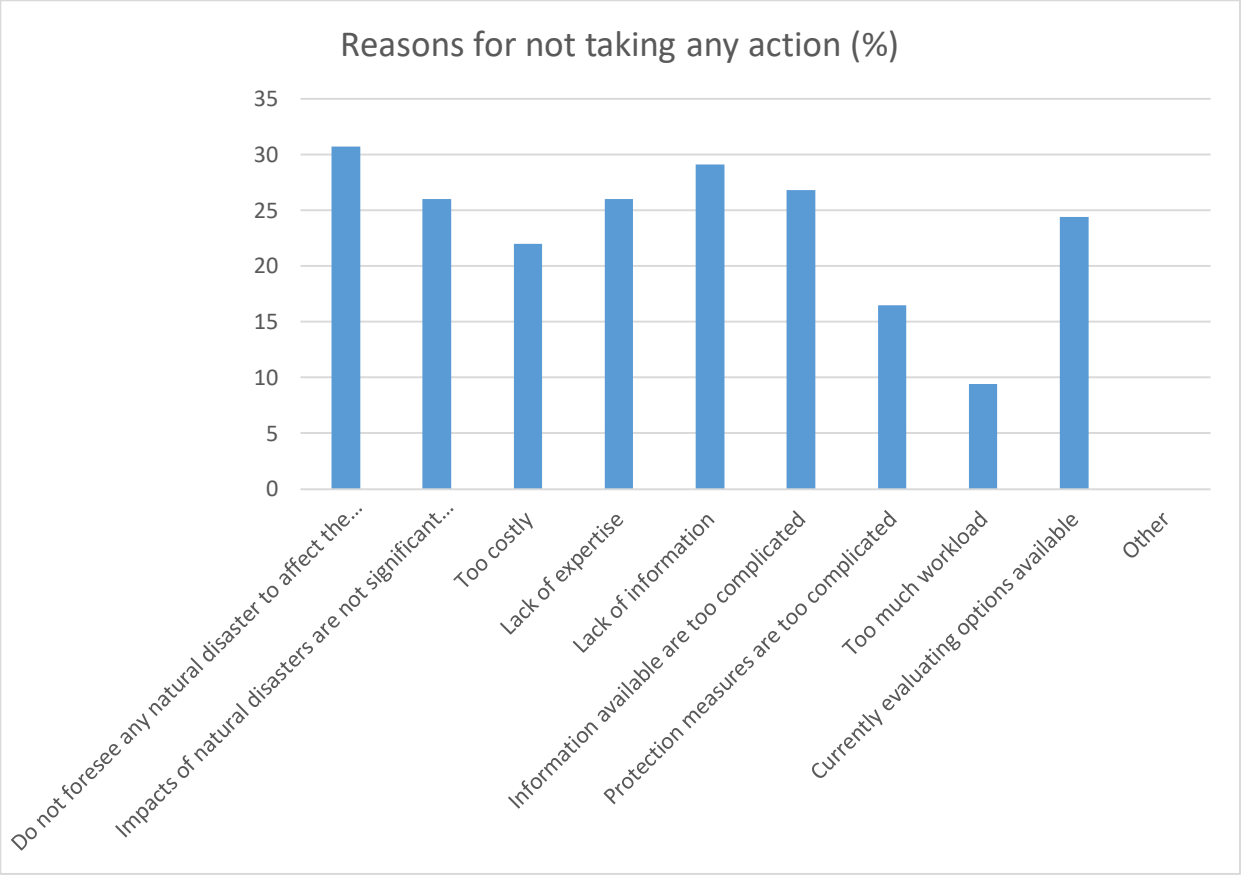

Figure 19: Reasons for not consider any action in the future

6.9 Business resilience and business continuity management

The final part of the questionnaire is evaluation of business resilience and business continuity management (BCM). In this part, all respondents are required to rate 16 statements based on the Likert Scale of "*strongly agree*", "*agree*", "*don't know*", "*disagree*" and "*strongly disagree*". The given statements cover various aspects such as business resilience, implementation of BCM, understanding of BCM and capability to impose BCM.

In order to analyse the resilience of the respondents, a descriptive analysis was done to get the *mean scores* of four statements that related to business resilience. The *mean score* for each statement is presented in Table 23.

Table 23: *Mean score* for the respondents' business resilience (n = 127)

Statistics

		business is resilient	continue business immediately	have enough fund	Business resilience is an important element
N	Valid	127	127	127	127
	Missing	0	0	0	0
Mean		3.09	3.17	2.94	3.53

Table 23 proposes that many respondents believed that business resilience is an important element for their business. However, lack of financial resources is the main problem for the SMEs to achieve resilience. When the respondents were asked whether they have enough funds to continue their business after being hit by disasters, the statement recorded the lowest *mean score* (2.94) among the other statements.

The next analysis is to check the BCM understanding among the respondents and how the understanding can be related to their business resilience. Table 24 shows the frequency of each statement that related to the respondents' understanding of BCM.

Table 24: Frequency of respondents' understanding of BCM (n = 127)

Statement	Strongly agreed	Agreed	Don't know	Disagreed	Strongly disagreed
1. I'm familiar with the term 'Business Continuity Management'	2 (1.6%)	35 (27.6%)	27 (21.3%)	38 (29.9%)	25 (19.7%)
2. I understand the concept of BCM	1 (0.8%)	32 (25.2%)	26 (20.5%)	37 (29.1%)	31 (24.4%)
3. I believed BCM is useful for my business	3 (2.4%)	41 (32.3%	78 (61.4%)	5 (3.9%)	0
4. My business needs a BCM framework	2 (1.6%)	40 (31.5%)	81 (63.8%)	4 (3.1%)	0
5. I believed BCM would help my business dealing with disaster	3 (2.4%)	43 (33.9%)	78 (61.4%)	3 (2.4%)	0
6. Establishment of BCM framework would reduce the impacts of disaster to my business	4 (3.1%)	41 (32.3%)	78 (61.4%)	4 (3.1%)	0

Based on the frequency table above, it is clear that the understanding rate of BCM among the respondents is low. Referring to the first two statements, most of the surveyed SMEs opted for "disagreed" and "strongly disagreed" with the statements. There is slightly above 20 percent for both statements where the respondents gave "don't know" answers. Actually, it is quite difficult to find out why they stated "don't know" for both statements but, logically, they gave this answer because they do not know what BCM is all about. Based on that assumption, more than 70 percent of the respondents were not familiar and did not understand the term and concept of BCM.

The next four statements are more on the benefits of BCM on the respondents' perspective. The trend for these statements is similar where many respondents agreed with the statements compared to disagree, and none of them strongly disagreed with these statements. This means that although many of the respondents were not familiar with BCM, they believed that BCM would give benefits for their business operations.

However, the main problem in making this conclusion is that many of the respondents indicated "don't know" for these statements (> 60%). So, in order to identify factors that contributed to this situation, *cross tabulations* analyses were done to identify who gave the answer. The first *cross tabulation* analysis was to check the relationship between the respondents who said "don't know" and their disaster experience. The result found that many of them (61.4%) were SMEs whose business was not affected by disasters. Since their business was never affected by natural hazards, they might not be familiar with BCM and have no idea of its benefits. The next *cross tabulation* analysis was to check whether they implement BCM in their business or not. The result found that none of these SMEs (who answered "don't know") implemented BCM in their business operations. Therefore, this is a strong reason to justify this situation.

The next analysis is to measure capability of the respondents in implementing BCM in their business. This analysis can be used to identify problems which distract SMEs in implementing BCM. From the 127 surveyed respondents, 23 (18.1%) implemented BCM while 104 (81.9%) did not implement. This means many SMEs in developing countries are less interested in implementing BCM in their business operation even when they are the most vulnerable party when the disaster hit**.**

Pearson's correlation was used to analyse the relationship between SMEs' capabilities and BCM implementation. Capabilities here refer to: (1) business capability to draft BCM framework; (2) financial capability to implement BCM; and (3) expertise to implement BCM. Before the *bivariate correlation* was done, it is important to check that the data met all assumptions of the correlation. Firstly, a normality test has to be done to ensure the normality assumption is not violated. However, the result of the normality test shows that the Sig < 0.05, which means normality and linearity assumptions were violated, so *Pearson's correlation* cannot be done for these variables. As an alternative, Allen et al. (2014) proposed the *Spearman's Rho* and *Kendall's Tau-B correlation* if the assumptions of normality and/or linearity cannot be met. In this research, parametric analyses were used previously because the normality assumption is not violated, however, for this part, *non-parametric analysis (Spearman's Rho correlation)* was used because the normality assumption cannot be fulfilled. Allen et al. (2014) argues that the combination of *parametric* and *non-parametric* tests may be done for the same data set if the sample is large (> 20). In this research, the sample is 127 so both *parametric* and *non-parametric* tests can be done.

Spearman's rho indicated that the presence of a strong correlation between all the three capabilities and implementation of BCM among respondents. For the business capability to draft BCM framework, $r_s = .394$, $p < 0.001$, two-tailed, $N = 127$. The financial capability to implement BCM

result is $r_s = .399$, $p < 0.001$, two-tailed, $N = 127$ and for expertise capability, $r_s = .181$, $p < 0.001$, two-tailed, $N = 127$.

The result of the *Spearman's rho* shows that all the three elements of capability are important for SMEs to decide whether to implement BCM or not. As stated before, 81.9 percent of the respondents did not implement BCM and the result of *Spearman's rho* explained the reason of the situation; either the SMEs are not met with any of the proposed capability or all of it.

6.10 Summary and link

Many SMEs in Malaysia are exposed to various natural hazards including floods, storms and heat waves. Although they are exposed to these natural hazards, results from the survey indicate that not many of them have implemented coping strategies or considered any coping strategies to be used in the future. Therefore, related parties such as government agencies and private companies need to play more significant roles to increase the awareness level of SMEs of the risk of natural hazard, including its impacts and severity.

Furthermore, not many of the surveyed SMEs identified the use of BCM as a disaster management tool. Indeed, many of them have no idea at all about BCM and what BCM can offer. Therefore, once again, related government agencies should take responsibility to promote BCM among the SMEs. Many of the surveyed BCM believed that government should provide necessary training about this and most of them stated their willingness to participate in the training programs. In addition, private companies can also offer training on BCM to the SMEs but within their affordable budget.

The findings of the survey have implications for policy makers, private companies, business support organisations and other organisations involved in SME policy and practice, especially in

introducing DRR programs in the future. Literatures in Chapter 2 indicate the importance of SMEs in the economic development of a nation, thus those parties ensure that SMEs are better prepared for the natural hazards. They need to provide sufficient information on BCM and other available coverage which is understandable, affordable and not complicated.

Finally, the survey partially answered the research question of:

- How do the natural hazards affect SMEs in Malaysia? (Section 6.4)
- What are the roles played by other parties in supporting SMEs to manage natural hazards in Malaysia? (Section 6.5)
- What are the perceptions of SMEs towards the existing DRR programs in Malaysia? (Sections 6.5 and 6.6)
- What are the factors that determine the disaster resilience of SMEs to natural hazards? (Section 6.7)

The next chapter will synthesize and cross evaluation of analyses in Chapter 5 and Chapter 6 to provide evidence to support the answers for the research question. Accordingly, the next chapter presents the discussion of findings of all data collected which will also be used to finalise the initial conceptual framework proposed in Section 2.5.

CHAPTER 7

DISCUSSION

7.1 Introduction

The last two chapters (Chapters 5 and 6) presented the results obtained for this research. Chapter 5 presented the analysis and results from the interviews while Chapter 6 presented the analysis and results of the questionnaires survey. Therefore, the purpose of this chapter is to synthesize results from both chapters and the reviews from previous research which is available in literature reviews (Chapters 2 and 3). The synthesis is important in order to develop the evidence base to answer the research questions raised in Section 1.5.

The chapter is divided into two main parts; firstly, the findings from the interviews analyzed, together with elements from the questionnaire survey findings, as well as the literature review. Secondly, the conceptual framework developed for the study is populated and refined, based on the findings of the study.

As stated in Section 1.5, the research questions developed for this research are:

1. How do the natural hazards affect SMEs in Malaysia?
2. What are the roles played by related parties in supporting SMEs to manage natural hazards in Malaysia?
3. What are the perceptions of SMEs towards the existing DRR programs in Malaysia?
4. What are the factors that determine the disaster resilience of SMEs in Malaysia?
5. Can a guideline be developed to help SMEs continue their business after disasters hit?

7.2 Impacts of natural hazard to SMEs in Malaysia

As stated in Section 2.3.3, SMEs are exposed to various natural hazards due to their size and financial limitations, lack of expertise and geographical location and, because of these reasons, SMEs are especially vulnerable to disasters. Falkner and Hiebl (2015), for example, suggested that SMEs are exposed to both natural and man-made disasters, mainly because of lack of financial expertise, but also geographical location. This exposure led to the high negative impacts of disaster on SMEs including in developed countries. However, the impact of disaster on developing countries is more terrible. Section 2.3.3 disclosed what happened during Bangkok Flood in 2011 and Malaysia Flood (in Kelantan) in 2014. Therefore, all countries face the negative impacts of disaster, but the poorest tend to be most vulnerable to this risk and have a lower capacity to recover during and after the disaster (Göhl, 2008; Huq et al., 2004; Smith, 2013).

SMEs in Malaysia are also exposed to various natural hazards that lead them to higher vulnerability. The Symantec SME Disaster Preparedness Survey for Malaysia in 2012 suggested that more than 73 percent of SMEs in Malaysia were not prepared for any natural hazard. The survey also revealed that only 14 percent of respondents (SMEs in Malaysia) have an actual disaster recovery plan in place for implementation, while less than one third of the respondents have a secondary location where a mirror copy of information and data can be backed up. The interviews conducted also confirmed that the impacts of natural hazard were bad due to their location, awareness level and low capability (see Section 5.2). In addition, results of the survey also show that the majority of the SMEs agreed that the impacts of natural hazard to their business is very bad (see Section 6.5).

Thus, it can be concluded that the impacts of natural hazard are bad for SMEs in Malaysia. However, it is important to discuss how natural hazards affect SMEs in Malaysia. Based on the

literature reviews, natural hazards would affect the SMEs' overall business, which includes supply chain and daily operation. Many affected SMEs were unable to continue their business within the first six months after the flood in Kelantan (see Section 3.6). Results from the interviews also found similar indications. The respondents agreed that the SMEs' business is badly disrupted because of their inability to continue the daily operation, disruption of supply chain and loss of market share (see Section 5.2). In addition, the interview respondents also highlighted other impacts which are categorized as personal impacts in Section 5.2. The personal impacts consist of loss of income and property loss. Loss of income is considered as personal income because many SME owners run their business as their main personal income resources, as stated by **R6** in Section 5.2. On the other hand, the respondent also mentioned that the SME owners also have personal properties such as house and car, and disaster might also affect these personal properties.

Further detailed results can be found from the survey. From the survey, the respondents listed 13 business and personal impacts of natural hazard (see Section 6.5). Out of these 13 impacts, most of them are impacts to the SMEs' business which tallies with literature reviews and results of the interviews. Meanwhile, personal impacts as stated previously are also included in the list. For the list of impacts, many SME owners indicated that they lost their sales or production during and after the disaster which meant their daily operation was interrupted. Others highly ranked impacts also related to business such as non-attendance of employees, damage to stocks and equipment, decrease in turnover and disruption to the supply chain.

Therefore, from the literature reviews, interviews and survey, this research answers the research question that the impacts of natural hazards to SMEs in Malaysia are bad where they affect the overall business operations of the SMEs as well as personal properties of the SME owners.

7.3 Roles played by related parties in supporting SMEs to manage natural hazards in Malaysia

Many previous studies have investigated the role of other parties in managing disasters to SMEs, including government (Coppola, 2006; Herbane, 2013a; Maruya, 2010), the private sector (Chatterjee & Shaw, 2015a; Li, 2015; Shaw & Izumi, 2015) and NGOs (Li, 2015). Involvement of these parties would help SMEs to increase their resilience. As mentioned before, lack of finance and expertise is the main problem faced by SMEs in managing disaster. Therefore, if all the parties play their roles, these problems could be reduced and resilience increased. Based on the literature reviews (Chapter 2), results of the interviews (Chapter 5) and findings of the survey (Chapter 6), three main parties involved in disaster management are the government, private sector and non-government organizations (NGOs). Therefore, this section will discover the roles played by these parties in supporting SMEs in managing natural hazards in Malaysia.

7.3.1 Government

The role of government in mitigating disaster has been discussed extensively in previous chapters. Many studies agreed that government is the main stakeholder that should play a significant role in dealing with disasters and SMEs (see Section 2.4). Maruya (2010) and Herbane (2013) indicated that government should establish a disaster management legislation, regulation or framework for SMEs in order to reduce or minimise the impact of disasters.

A similar situation can be seen in Malaysia. As discussed in Section 3.7.1, in Malaysia, government is divided into three levels: federal, states and local governments. Each level has its own responsibilities in mitigating disasters but federal government plays the most significant role including declaration of emergency and major disasters status, drafting and implementing disaster

management policies, and as the source of funding, activating the federal response plan and emergency support functions by agencies at federal level.

Respondents from the interview also have similar views where 5 out of 7 respondents (**R2, R4, R5, R6** and **R7**) agreed that one approach to support SMEs to manage natural hazards in Malaysia is by introducing related legislation. The respondents also highlighted the need for the government to regulate the SMEs in order to ensure they comply with the proposed legislation.

Besides developing the frameworks and guidelines, government can also provide training or disaster management for SMEs (Kusumasari, Alam, & Siddiqui, 2010b). This is important in enhancing SMEs' preparedness and recovery. According to the literatures, many DRR programs and training have been conducted in Malaysia (see Section 3.7.1) but none of the programs was designed specifically for SMEs. This statement is supported by the interview where all respondents talked about the importance of training to enhance disaster awareness and preparedness among SMEs in Malaysia.

The survey also shows that 60 percent of the respondents have not participated in the DRR programs including training because they are not aware of it. In addition, 39 percent of the respondents stated that the current DRR programs in Malaysia are not suitable for SMEs, although 75 percent of them stated that the DRR programs, including training, are important in assisting SMEs dealing with disasters in Malaysia.

Another role to be played by the government is to provide financial assistance. Based on the literatures in Chapter 3, the government has allocated USD$3.7 billion for a disaster mitigation program in Malaysia since 2006. This allocation includes DRR projects around the country, soft loans and grants for affected entities through government agencies and compensation for victims

of disasters (see Section 3.7.1). In the interviews, **R1** listed several financial incentives provided by the government to SMEs in Malaysia including emergency fund, soft loans and grants (see Section 5.5.7). In addition, **R2, R3, R4, R6** and **R7** proposed that the government should provide more financial incentives such as soft loans and grants and at the same time introduce new financial assistance such as tax rebate and subsidy for any SMEs implementing DRR programs in their business (see Section 5.3.1).

Awareness is another important role that should be played by the government, as suggested by literatures (see Section 3.7.1) The government must take necessary actions to increase awareness, education and public participation in disaster management (Aini, Fakhru'l-Razi, & Daud, 2001). The awareness issue was also highlighted several times by the interview respondents. **R2, R5, R6** and **R7** mentioned that some SMEs have no or low awareness regarding risks and disasters that might occur around them. Low awareness resulted in many SMEs failing to identify risks that might occur around them and its impacts, as stated by **R4** and **R5**. Therefore, it is important to create awareness in these SMEs, as suggested by **R2, R5** and **R7**. The survey also indicated the same issues where 60 percent of SMEs in Malaysia were not aware of the DRR programs conducted by the government for them.

Based on this discussion, the government plays a huge and very significance role in supporting SMEs to manage natural hazards in Malaysia. The roles of the government include (1) drafting related policies and legislation that can govern SMEs in Malaysia, particularly in disaster management aspects, (2) providing financial assistance and incentives through its agencies for affected SMEs and incentives such as tax rebate and subsidy which can be offered to SMEs that implement DRR programs in their business, (3) providing related training programs to enhance

preparedness among SMEs in Malaysia, and (4) creating and raising awareness among SMEs in terms of existing DRR programs and also awareness of the potential risks around their business.

7.3.2 Private sector

In the previous section, this research discovered the important roles played by the government. However, given their financial constraints, it is difficult for the governments of developing countries to undertake all these responsibilities. Therefore, private sector companies are another party that can participate. The participation of private actors in government projects such as disaster management is important in order to deliver better services to the community. The main role of the private sector is to counteract any weakness on the government side (Busch & Givens, 2013).

In Malaysia, the private sector plays significant roles in DRR programs, especially financial institutions such as insurance companies and banks. Currently, only 18 percent of insurance companies in Malaysia offer products or coverage for SMEs (see Section 3.7.2). However, none of them covers SMEs for catastrophe and natural disasters risks. Their coverage is more on fire, burglary and mechanical breakdown. One of the reasons why insurance companies do not offer catastrophe insurance is because of the high risk which leads to high premiums, as stated by **R4**, **R6** and **R7**. Therefore, **R4** suggested that these insurance companies offer disaster related products for SMEs at the same time as ensuring the premium rate is within SMEs' budget.

Besides insurance companies, banks can also play a significant role, as stated by previous literatures (see Section 3.7.2) as well as results obtained from the interviews (see Section 5.3). Many banks such as SME Bank, Malaysian Development Bank and Agro Bank provide assistance in terms of soft loans to SMEs affected by natural disaster. However, according to **R4, R6** and **R7**, interest rates for these loans are quite high and the banks should reduce the rates. For these, maybe

the *Bank Negara Malaysia* can play its part in controlling the interest rates. Results from the survey also indicated that many SMEs in Malaysia refused to participate in DRR programs conducted by the private sector because they felt it very costly and beyond their budget (see Section 6.6).

Based on the interviews, **R4** and **R6** proposed that private companies can play their role in conducting training and preparedness programs for SMEs in relation to disaster management. This role can be done because these private companies, including multinational and public listed companies, have expertise which can be shared with SMEs. So, these big companies can conduct the training sessions for SMEs in order to increase their awareness and make them more prepared. However, according to literatures, not many of the big companies in Malaysia are interested in participating in disaster preparedness and awareness programs. According to Izumi and Shaw (2015), there were only two companies in Malaysia involved in disaster preparedness and awareness programs - Petronas and Tenaga Nasional Berhad. Therefore, to deal with this issue, R1 and R2 proposed that big companies should be involved actively in providing training for SMEs as part of their corporate social responsibility program (CSR) (see Section 5.5.7). There is also a suggestion in literature reviews to form a partnership between the government and private companies where the DRR programs of the government are conducted by the private companies which have expertise and financial capabilities.

7.3.3 Non-government organizations (NGOs)

Besides the government and private sector, many previous literatures agreed that NGOs also play significant roles in DRR. Haddow, Bullock, and Coppola (2013) categorised NGOs into three types: international, national and local. International NGOs in the disaster management context include agencies under the United Nations such as the United Nations International Strategy for Disaster Reduction (UNISDR) and the Inter Agency Standing Committee (IASC), international

financial organisations such as the World Bank and the International Monetary Fund (IMF), and also international development agencies such as the Asian Development Bank. In addition, international humanitarian agencies such as the Red Crescent Society and the Cooperative for Assistance and Relief Everywhere (CARE) also play significant roles in disaster and emergency management worldwide.

However, the existence of these international organisations in Malaysia is rarely to be seen because most of the natural disasters in Malaysia are local and can be managed internally without intervention from these international organisations. In addition, natural disasters in Malaysia do not result in humanitarian crises which might attract these organisations (see Section 3.7.3)

Domestically, there are a few NGOs involved directly and indirectly with DRR programs. However, many of these NGOs are actively participating in emergency and relief activities during and after disaster occurs. This is supported by the interviews where **R4, R5, R6** and **R7** indicated that the role to be played by NGOs for disaster management is quite limited and their focus is more on humanitarian assistance. According to these respondents, NGOs in Malaysia will usually be involved during and after the disasters occur to distribute food, water, clean up the affected areas and assist the emergency teams (see Section 5.4.4). However, Izumi and Shaw (2012) identified MERCY Malaysia as an NGO that is involved not only in post disaster activities, but is also involved in disaster preparedness and awareness programs in Malaysia (see Section 3.7.3).

Similar results were obtained from the survey. According to the respondents of the survey, most of them received assistance from government agencies and private companies during and after the disaster occurred. Only two respondents stated that they received assistance from NGOs (see Section 6.6).

Therefore, based on the literatures, interviews and survey, the government and private companies are the stakeholders that play significant roles in supporting SMEs to manage natural hazards in Malaysia. There are small roles played by NGOs but it is quite limited as a supporter to the government and private companies.

7.4 SMEs' perceptions on the existing DRR programs in Malaysia

There are no studies of SMEs' perceptions of the existing DRR programs in Malaysia. Therefore, this research will try to explore this issue through the conducted interviews and the survey. From the interviews, two main themes have been developed and discussion will be conducted based on them. The two themes are '**Awareness**' and '**Affordability**'.

7.4.1 Awareness

From the interviews, there are two types of awareness which can be discussed. The first is awareness of SMEs in identifying risk that might occur to their business due to natural hazards, and second is awareness of the existing DRR programs and financial assistance provided by the government and private companies.

Firstly, many SMEs in Malaysia failed to recognize the risks that might occur and affect their business. This issue was highlighted by **R2, R4** and **R6**, and according to them, many SMEs assume that their business will not be affected by disasters although they run their business in the disaster prone areas. R4 and R6 added that most SMEs in Malaysia have no knowledge on disaster management and this resulted in their failure to recognize potential risks to their business (see Section 5.5.6).

Conversely, based on the survey, many affected SMEs indicated that they are aware of the potential natural hazards that might occur around them. However, most of them are dissatisfied with the

information and warning that they receive prior to the occurrence of the natural disaster (see Section 6.5). Therefore, the government, through its related agencies, should take necessary actions to improve their communication so that the affected SMEs can get sufficient lead time to take action upon receiving information or warning.

On the other hand, almost all the interview respondents mentioned the support and assistance provided by the government and private companies as well as NGOs (see Section 5.5.6 and 5.5.7). However, according to **R2**, many of the SMEs in Malaysia are not aware of these. This view can be supported by the survey where the result showed 60 percent of SMEs in Malaysia were not aware of the existence of DRR programs in Malaysia. The survey also showed that more that 55 percent of the affected SMEs did not receive any assistance during and after the disaster (see Section 6.6). In addition, **R4** stated that many SMEs felt that existing DRR programs available in Malaysia are drafted for big companies and not suitable for them. The survey shows that 90 percent of affected SMEs felt that existing DRR programs did not help them overcome their problems. The result also suggests that more than half of the surveyed respondents agreed that DRR programs in Malaysia are costly, complicated and not understandable. Because of these problems, the affected SMEs did not participate in the DRR programs and felt that the programs were not useful for them (see Section 6.6). Therefore, all stakeholders including the government, private companies and NGOs must take necessary action to increase SMEs' awareness on this issue, such as outreach programs and also training for SMEs.

7.4.2 Affordability

Another issue that attracted attention from the interviews is affordability. Finance is an important issue for SMEs in developing countries, as suggested by many literatures (see Section 2.3.3 and 3.7). **R2, R4, R6** and **R7** also highlighted the high cost of being involved in DRR programs such

as insurance and preparedness programs. Because of the high cost, many SMEs decided not to participate and implement the DRR programs. They felt that the programs will waste their money and they have no budget allocated for such programs (see Section 5.4). As stated in Section 7.4.1, more than half of the surveyed SMEs stated that they refuse to participate in the DRR programs in Malaysia because it is costly and not useful for them. Therefore, all the related stakeholders are advised to conduct DRR programs with low cost such as social insurance. Partnership between the government and private companies is also useful in dealing with this matter, where the government can give tax rebate or subsidy to private companies that actively organize DRR programs for SMEs. At the same time, the private companies can increase their involvement as part of the corporate social responsibilities (CSR) programs.

7.5 Factors determining the disaster resilience of SMEs in Malaysia

Determining the disaster resilience of SMEs in Malaysia is one of the objectives of this research (RO4). Based on the literature, interviews and survey, many factors contributed to the disaster resilience of the SMEs. Thus, this research will not discuss all factors but will emphasize the factors that have significant impacts to this research as highlighted by the experts in the interviews. Based on the interviews, seven key factors have been highlighted by the respondents and discussion for this section will be done based on these seven key factors, which are: '**Legislation**', '**Preparedness**', **Low capability**', '**Location**', '**Mindset**', '**Awareness**' and '**Support**'.

7.5.1 Legislation

Legislation is one of the factors that can determine the resilience of SMEs. The term legislation includes acts, laws, regulations, frameworks, policies and guidelines. Many literatures highlighted the legislation available in other countries and how this legislation influenced the resilience of SMEs in those countries (see Section 2.4). Maruya (2010) indicates that the government of Japan

established a disaster management framework for SMEs in order to reduce or minimise the impact of disasters (see Section 2.4). In the United Kingdom, all local governments are required to provide disaster management guidelines for SMEs on their websites, in accordance with the 2004 Civil Contingencies Act 2004 (Fisher, Chmutina, & Bosher, 2015) (see Section 2.4). Meanwhile, in New Zealand, the government has introduced policies and guidelines to assist small business resilience. In 2008, it established the New Zealand Civil Defence and Emergency framework, to be adopted by all businesses including small businesses and according to Radford, Addison, and Ahmed (2013), the three aspects which most helped SME resilience were: (1) the role of insurance companies, (2) disaster policies introduced by the government, and (3) training for SMEs' owners/managers (see Section 2.5.4)

In Malaysia, the government is responsible for drafting and implementing disaster management policies as stated in the NSC Directive No. 20 (see Section 3.7.1). However, from the interviews, three respondents (**R1, R4** and **R6**) agreed that currently there is no legislation or regulation for SMEs in Malaysia to implement DRR. This opinion was supported by **R6** who suggested the need to introduce new regulation about this matter, while **R2** and **R5** insisted that all SMEs in Malaysia comply with the new regulation or legislation mandatorily. Furthermore, **R2** and **R6** highlighted the non-existence of a regulator to govern all SMEs in Malaysia because without a regulator, it is difficult to apply regulation to the SMEs (see Section 5.5.1)

Therefore, in order to increase disaster resilience among SMEs in Malaysia, it is important for the government to introduce and implement relevant laws, frameworks or guidelines to be followed by these SMEs.

7.5.2 Preparedness

Several literatures highlighted that SMEs are not well prepared for dealing with disaster (see Section 2.3.3). For that reason, government should provide training or disaster management for SMEs in enhancing SMEs' preparedness and recovery (Kusumasari, Alam, & Siddiqui, 2010b) (see Section 2.4). SMEs in Malaysia are also facing the same problem. According to the Symantec SME Disaster Preparedness Survey for Malaysia in 2012, more than 73 percent of SMEs in Malaysia were not prepared for any natural hazard. The survey also revealed that only 14 percent of respondents (SMEs in Malaysia) have an actual disaster recovery plan in place for implementation, while less than one third of the respondents have a secondary location where a mirror copy of information and data can be backed up (see Section 3.6)

From the interviews, **R3** highlighted the importance of preparedness to SMEs as it can reduce cost and make SMEs more resilient. In order to become more prepared for natural hazards, **R4** suggested several actions to be taken by the SME owners and employees which is include SME involvement with existing DRR programs. However, this suggestion is difficult to implement because most of the SMEs are not aware of the DRR programs available in Malaysia. Furthermore, **R4** also suggested other actions such as disaster mitigation, development of DRR plan, review existing DRR plan, back-up and data recovery and risk assessment. **R4** believed that SMEs are highly prepared for natural hazards if they can apply these suggestions.

Similar evidence is obtained from the survey where many respondents are not prepared for natural hazards. Only 15 percent of the respondents have taken necessary preparedness actions, such as backing up their business data. (see Section 6.7). Therefore, all related stakeholders including the government and private companies need to do more training for SMEs in Malaysia to make sure they are well prepared in the event of natural hazards.

7.5.3 Low capability

Due to their size, lack of expertise and financial limitations, SMEs are especially vulnerable to disasters. For example, Falkner and Hiebl (2015) suggested that SMEs are exposed to both natural and man-made disasters, mainly because of lack of financial expertise, but also geographical location (see Section 2.3.3). In addition, many other literatures agreed on this issue and some of them stated that lack of finance and expertise is the main problem faced by SMEs in managing disaster (see Section 2.4).

From the interviews, **R2, R4**, and **R5** stated that SMEs have highly skilled workers but not in the area of disaster management. Meanwhile, **R2, R4, R5**, and **R7** indicated that SMEs in Malaysia have no or maybe limited financial capability to invest in disaster management. In addition, as stated in Section 5.4, several respondents agreed that many SMEs cannot afford to pay for insurance to protect their business. Furthermore, **R2** indicated the limited option for SMEs which resulted from low capability. Limited option means SMEs are not able to move to a safer place because of their low capability including limited money and they are also unwilling to lose their existing market and customers. On the other hand, **R2** highlighted the issues of no financial assistance provided by government agencies and private companies. However, this opinion is contradicted by other respondents who indicated the existence of the assistance but awareness is the main issue (see Section 5.5.3). The data from the survey also concluded that lack of financial resources is the main problem for the SMEs to achieve resilience (see Section 6.8).

Therefore, low capability is another important issue to be highlighted here because it can also determine the SMEs' resilience. Once again, training might play a significance role in order to develop disaster management skills among the SME owners.

7.5.4 Location

Falkner and Hiebl (2015) stated that SMEs are vulnerable to disasters and one of the reason sfor that is geographical location (see Section 2.3.3). This view is supported by the interviews where according to **R4** and **R5**, many SMEs run their business on low land, near river basins and disaster-prone areas. Usually the low land areas are exposed to disasters such as flood. Although **R2** suggested that these SMEs should move to safer place, according to **R4** and **R7**, most of them refused to move to a safer place because they run their business locally, which means they get their resources locally and they market their products and services locally, as stated by **R2** and **R4** (see Section 5.5.4).

To deal with the problem, the government should provide specific areas for SMEs to run their business. The areas must not be exposed to natural disasters and complete with facilities needed by the SMEs. However, this action may not be suitable for SMEs because some SMEs still depend on local resources to run their business and market their products locally.

7.5.5 Mindset

Mindset is the only key factor here that is not discussed in the literature but was discussed widely in the interviews. This shows that study of the SMEs' mindset on disaster is a new area which can be explored by researchers. In the interviews, many respondents agreed that mindset plays a significant role in determining SMEs' resilience in Malaysia. For example, **R6** stated it is difficult to change SMEs' perception and paradigm towards disaster management. In addition, **R4** stated that many SMEs assumed that their business will not be hit by natural hazards and in case their business was affected by disasters, they assume they can survive (see Section 5.5.5). These views are supported by the survey where 50 percent of the respondents did not see any natural hazards affecting their business in future (see Section 6.7).

According to **R4, R5** and **R7**, many SMEs have been hit by natural hazards but they never learn and never take necessary actions to avoid or at least to reduce the impacts of the natural hazards. In addition, some SMEs assume that DRR programs available in Malaysia are only for big companies and not suitable for them (**R4**) and some of them are not interested in it (see Section 5.5.5). Similar results were obtained for the survey where more than 90 percent of SMEs hit by disasters felt that the existing DRR programs in Malaysia did not help them (see Section 6.6), and 50 percent of the respondent may not consider any disaster preparedness and prevention actions in the future (see Section 6.7).

Therefore, in order to deal with these problems, more outreach programs need to be conducted by related agencies to change SMEs' mindset. Training is also useful to make them more prepared and the government and other related parties need to improve the existing DRR programs in Malaysia so that it can fit the SME requirements.

7.5.6 Awareness

According to the literature, the government of Malaysia has paid attention to disaster management by allocating some money for that purpose. The purpose of this allocation is to deal with the flood mitigation programs, forecasting and warning facilities, as well as the development of disaster preparedness and community awareness programs and flood hazard maps (see Section 3.7.1). At the same time, there are not many disaster awareness programs conducted by the government to the public as well as to the business entity including SMEs. Therefore, the literature suggests that the government must take necessary actions to increase public awareness, education and public participation in disaster management (see Section 3.7.1)

The respondents of the interviews also shared the same view where they stated that awareness is important for everybody when they dealing with disasters. **R2, R5, R6** and **R7** mentioned that

some SMEs have no or low awareness regarding risks and disasters that might occur around them (see Section 5.5.6). However, many SME owners disagreed with this statement. Based on the survey, respondents were aware of the natural disaster occurring around them but they were not given sufficient time to take necessary actions during the disaster occurrence (see Section 6.5). Therefore, the government and related agencies need to improve their information delivery system so the affected SMEs can take necessary actions to reduce their loss.

R2 also highlighted that some of these SMEs are not aware of the DRR programs and assistance available for them. Low awareness resulted in many SMEs failing to identify risks that might occur around them and its impacts, as stated by **R4** and **R5**. Meanwhile, **R2**, **R5** and **R7** also highlighted the importance of creating awareness in SMEs. At the same time, **R2, R4** and **R6** suggested that awareness can be created through training by government agencies or private companies and a high level of awareness can develop preparedness for the SME (see Section 5.5.6). Similarly, the survey showed that almost 60 percent of the SMEs were not aware of any DRR programs in Malaysia (see Section 6.6), while as stated in Section 7.5.5, more than 90 percent of SMEs hit by disasters felt that the existing DRR programs in Malaysia did not help them.

Therefore, all the related stakeholders need to create more DRR programs for SMEs and at the same time they need to do more promotion on the programs in order to increase SMEs' awareness of the programs.

7.5.7 Support

According to Kusuma, Alam & Siddiqui (2010b), the government and other stakeholders should support SMEs by providing training or DRR programs (see Section 2.4). However, many literatures stated that there had been no action by government or other stakeholders in helping SMEs to address these issues, especially in developing countries like Malaysia (see Section 2.3.3).

Studies by Herbane (2013a), McGuinness and Marchand (2014), Schneider (2014) and Fisher et al. (2015) indicated that successful DRR programs require support from all external parties and stakeholders such as government sector, private sector and NGOs (see Section 3.7)

In Malaysia, the government has allocated USD$3.7 billion to support the disaster mitigation programs in the last 10 years. At the same time the government has activated the federal response plan and emergency support functions by agencies at federal level (see Section 3.7.1). From the private sector, several banks such as SME Bank, Malaysian Development Bank and Agro Bank provide assistance in terms of soft loans to SMEs affected by natural disaster (see Section 3.7.2).

According to **R1, R2, R3, R6** and **R7**, government support is essential for SMEs for their resilience. **R1** highlighted some existing programs offered by the government such as grants, soft loans and emergency fund for affected SMEs. However, according to **R2**, many SMEs are not aware of this financial assistance. **R2, R3, R6** and **R7** also suggested that some programs be conducted by the government to ensure SMEs' resilience, including series of training, social insurance and immediate responses and relief for affected SMEs. Meanwhile, **R1, R2, R3. R4** and **R6** highlighted the support from private companies. They suggested that private companies can offer support such as training, low insurance premiums, low interest loans and sharing their expertise with SMEs. In addition, **R1, R2**, and **R4** proposed activities such as providing training and expertise sharing which can be done as part of their corporate social responsibilities (CSR) programs (see Section 5.5.7).

Although there is much support provided by government agencies and private companies as discussed before, results from the survey showed that only 26.8 percent of the respondents received any assistance or support from any party to recover from the effects of a natural hazard and continue their operation. On the other hand, half of the affected respondents did not receive any

assistance, while the rest stated that they did not need any support from the government and private companies (see Section 6.6).

Therefore, based on these arguments, the government and private companies need to provide and conduct more programs to support these SMEs. At the same time, all the related stakeholders also need to increase promotion of their programs so that SMEs would know of the existence of these programs.

7.6 Updated conceptual framework

Based on the initial framework that had been developed before (see Figure 2 in Section 2.7.2), an updated framework will be developed after incorporating the related concepts or themes from the data collection. The themes incorporated to the frameworks are the themes that can determine the disaster resilience of SMEs in Malaysia, as discussed in Section 7.5. Some of these themes can be presented as roles of stakeholders such as '**Legislation**', **Preparedness**', '**Awareness**' and '**Support**', while some of them are within SMEs' internal control such as '**Low Capability**', '**Location**', and '**Mindset**'. The themes '**Low capability'**, '**Location**' and '**Mindset**' are considered as the internal control because these are the items that cannot be controlled by stakeholders. Only SMEs themselves can control them. For example, the government can propose a safe place for SMEs to operate but it may not suit all SMEs because of factors discussed before. At the same time, the elements of '**affordability**' and '**easy to understand**' as discussed in Section 5.6 also will be inserted in the framework as the main principle.

In addition, the part result in the initial framework (Figure 2) is changed to the term '**Disaster Resilience**' because, at the end, the purpose of this framework is to develop disaster resilience among SMEs in Malaysia. Figure 19 shows the updated framework for BCM for SMEs in Malaysia.

7.7 Summary and link

The purpose of this chapter is to create more evidence on the topic of this research and to develop the answers for the research questions. Information from literature reviews has been synthesised with the data from the interviews and survey to form arguments needed for this research. From this chapter, the impact of natural hazards to SMEs in Malaysia is assessed, the roles of the stakeholders were discussed widely, the SMEs' perceptions of the existing DRR programs in Malaysia were discovered and key issues in determining disaster resilience among SMEs in Malaysia were identified. In addition, the initial framework of this research has been updated based on the data obtained from this chapter. Finally, this chapter has answered the research question of:

- How do natural hazards affect SMEs in Malaysia? (Section 7.2)
- What are the roles played by other parties in supporting SMEs to manage natural hazards in Malaysia? (Section 7.3)
- What are the perceptions of SMEs towards the existing DRR programs in Malaysia? (Sections 7.4)
- What are the factors that determine the disaster resilience of SMEs to natural hazards? (Section 7.5)

In the next chapter, once again the framework will be evaluated but this time it will be evaluated by experts in the related area. Validation of the framework will be reported in the next chapter in order to check the reliability of the framework before it can be used.

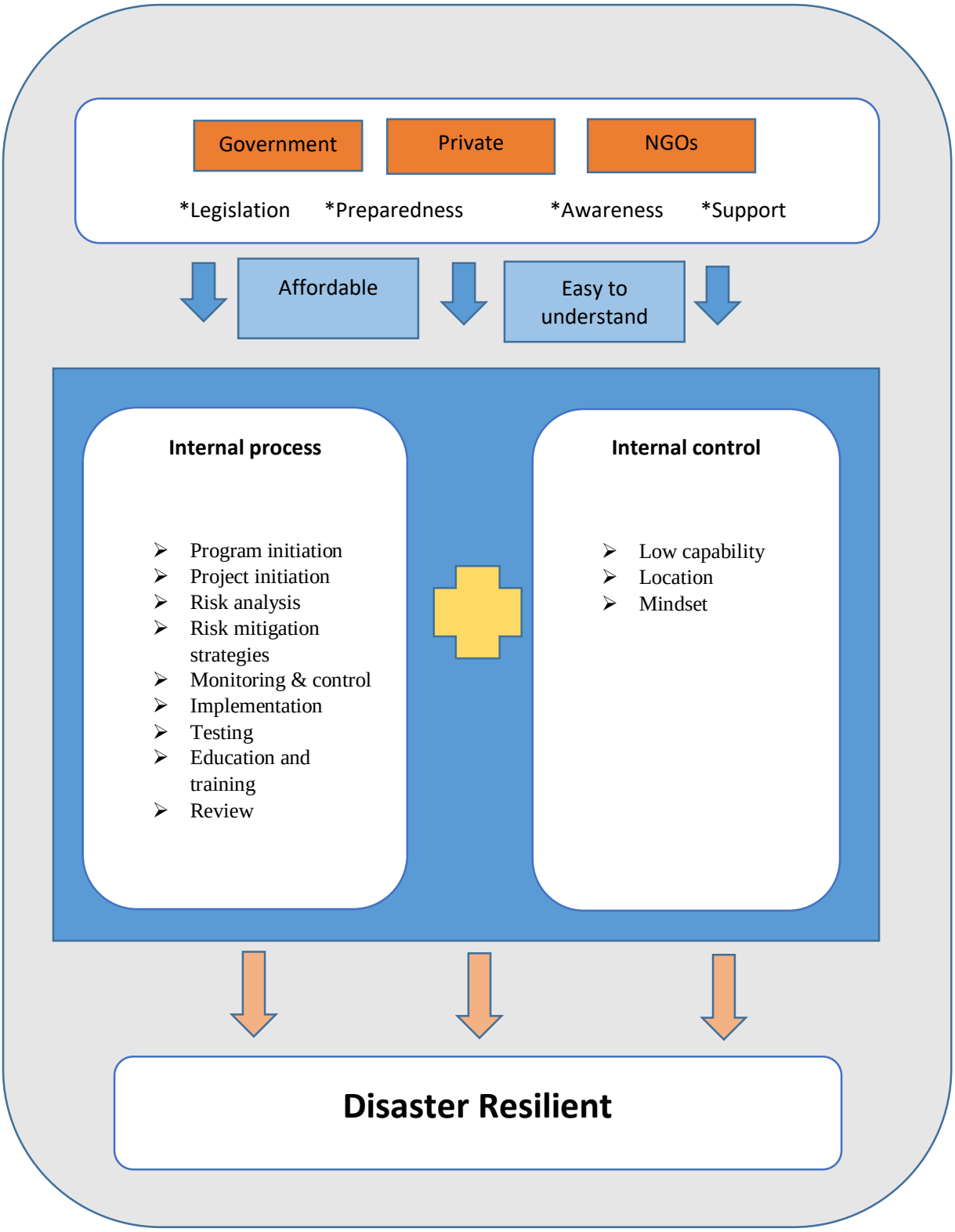

Figure 20: Proposed updated BCM framework for SMEs in Malaysia

CHAPTER 8

VALIDATION TESTING

8.1 Introduction

In the previous chapter, this research proposed the updated framework after incorporating related information from the interviews and survey. However, it is important to check the validity of the proposed framework (Figure 20). Therefore, in this chapter, the proposed framework will be validated by selected experts. The purpose of the validation is to check the reliability of the framework. At the same time, the interview sessions are used in order to get the experts' views on the significance of this research area and the implementation of the framework in reality including the potential barriers that might exist.

The chapter is divided into four parts. The first part explains the methodology used for this chapter (Section 8.2) and the brief background of the respondents (Section 8.3). Then the second part (Section 8.4) will check the significance of the research area where analysis from Section 5.6 also will be discussed. The third part (Section 8.5) will show the proposed framework and how the framework is updated, and the final part (Section 8.6) will discover issues arising in implementing the framework.

8.2 Methodology

The validation is done based on the semi structured expert interviews. All the selected respondents have expertise in this research area. One of the respondents was also the respondent in the main data collection before, while other respondents are not involved in that phase. Originally, five respondents agreed to participate in this research. However, due to several problems, only three of them managed to participate, while another two cancelled their participation.

The interviews were conducted online, two through phone calls while another one by Skype application. Although appointments for face to face interviews had been made, due to the respondents' commitments, they could not commit for the face to face interviews and changed it to online interviews. The information sheet which contained the interview guidelines was emailed to the respondents once they agreed to participate. The proposed framework (Figure 19) was also attached in the email for their reference.

The data from the interviews were analysed using '*Thematic Analysis*' with assistance of the application *ATLAS.ti*. The purpose of the analyses is to identify themes used by the respondents before the themes were developed as evidence for each of the related sub-topics. At the same time, data analysed in Section 5.7 are also used to support argument on certain topics.

8.3 Respondents' profiles

As stated before, three interviews were conducted to validate the proposed framework. The respondents were selected from different backgrounds and represented different segments. Therefore, this section will briefly explain the background of the respondents with consideration for research ethics and the University's regulations.

8.3.1 Respondent 1 (V1)

The first respondent was an academician and Professor of Risk Management. The respondent has more than 40 years' experience as an academician as well as in industry. Based on the respondent's curriculum vitae, the respondent has interest in the area of risk management, insurance, crisis management, disaster management and BCM. After retiring as an academician, the respondent was appointed to lead an organization that actively promotes awareness of risk and crisis management in Malaysia. The respondent was selected because of the expertise in the area of risk, crisis and disaster management, as well as BCM.

8.3.2 Respondent 2 (V2)

The second respondent is one of the Deputy CEOs of an organization that is responsible for coordinating and monitoring SMEs' development in Malaysia. The respondent was a banker which made the respondent familiar with BCM because BCM is common in the financial industry. Before the respondent was appointed as a Deputy CEO, the respondent was the person involved in the business advisory and support for SMEs in Malaysia. So, the respondent has much experience dealing with SMEs in Malaysia and that was the main criterion for why the respondent was selected to participate in the interview.

8.3.3 Respondent 3 (V3)

The third respondent represents the government agency responsible for disaster management in Malaysia. Currently, the respondent is one of the directors in the agency. Originally, the Director General of the agency was contacted and agreed to participate in the interview. However, the Director General had another commitment on the date and asked one of the directors to be a replacement. The respondent has worked in various government agencies and ministries for more than 20 years. Therefore, the respondent is familiar with government policies, procedures and how the government works.

8.4 Significance of the research area

One of the elements during the interview is to know the need for this research. For this purpose, there was a question that asked the significance of the research area to be explored now. The answer for this question can be divided into two categories: novelty of the research and the need for the research in this area. Besides the information obtained from the validation process, results from previous interviews, reported in Chapter 5, are also included in this section.

8.4.1 Novelty

Novelty is the issue arising in doing research. Therefore, this issue is also explored in the research in order to check whether the research has been done before and the proposed framework is currently available or not. In Section 5.7, the respondents, **R2, R4, R6** and **R7** confirmed that there is currently no BCM framework available for SMEs in Malaysia. Although the Department of Standards Malaysia has developed MS 1970:2007 Business Continuity Management Framework based on the ISO31010, the respondents agreed that the framework was developed for large companies, not for SMEs. In addition, **V3** stated that the research area is something new to be explored in Malaysia.

8.4.2 Need for the research in this area

Another issue to be explored here is the need for the research. This is important in order to ensure that the research area is demanded and needed. Based on the interviews, all respondents (**V1, V2** and **V3**) agreed that the research area is something important and this research is needed right now. **V1** and **V3** stated the importance of disaster resilience among SMEs in Malaysia, while **V2** highlighted the need for research in the area of BCM in Malaysia, especially for SMEs. In addition, **V2** highlighted the need to conduct BCM training for SMEs in Malaysia to make them more resilient to natural hazards.

8.5 Development of the framework

The proposed conceptual framework for this research has been through several changes in different phases. The framework was developed in the first phase based on the literature reviews (see Figure 2 in Section 2.7.2). Then, this initial conceptual framework was once again amended based on the data and information obtained in the interviews and survey (see Figure 19 in Section 7.6), After that, the proposed conceptual framework will be validated and necessary changes will be carried

out based on the validation interviews. Finally, once again the proposed conceptual framework has been emailed to the participants of the validation process for final comments.

During the interviews, there were several amendments proposed by the respondents. **V1** commented on the presentation of the framework. **V1** suggested the framework follows presentation of the *ISO31000 Risk Management Framework*. That means that the framework should be done horizontally instead of vertically. This is to provide more spaces and more information can be included. **V1** also suggested that the terms '**affordability**' and '**easy to understand**' should be placed inside a box which is labelled as principle because these two terms actually are the main principles of the framework. The respondent also proposed putting labels on all boxes. In addition, the respondent mentioned that the internal control and internal process can be combined within one box because both of them are roles to be played by SMEs. However, based on the literature and the collected data, internal process is part of the BCM process while internal control is an element to be controlled by SMEs in order to implement the internal process. Therefore, these items cannot be combined in one single box as proposed by **V1**.

On the other hand, **V2** highlighted the issue of disaster resilience. Although the respondent agreed that the implementation of BCM framework resulted in disaster resilience, the respondent argued about how resilience is measured. How do SME owners know they have achieved resilience? Based on that argument, the elements of resilience as proposed by Wedawatta, (2013) are included in the framework. The elements of resilience are 1) reduce vulnerability, 2) increase coping capacity, and 3) develop coping strategies (see Section 2.5.3). In addition, the respondent also suggested inserting the BCM lifecycle in the framework including the Business Impact Analysis (BIA). However, the BCM lifecycle and BIA have been incorporated in the internal process. Some

of the items in the 'internal process' are also terms used in the BCM lifecycle. The BIA should be covered under the risk analysis of the internal process.

Furthermore, the **V3** also suggested some amendments to the framework. The respondent suggested deleting the word '**low**' from the term '**low capability**' because according to the respondent, not all SMEs in Malaysia have low capability, some of them have capability and some of them have no capability at all. So, based on the recommendation, the term '**low capability'** is changed to '**capability**'.

Based on the recommendations and suggestions received from the respondent, the updated conceptual framework was proposed as Figure 21. As stated before, this updated proposed conceptual framework had been emailed to the respondents again to get their final opinion but none of them gave their final comment.

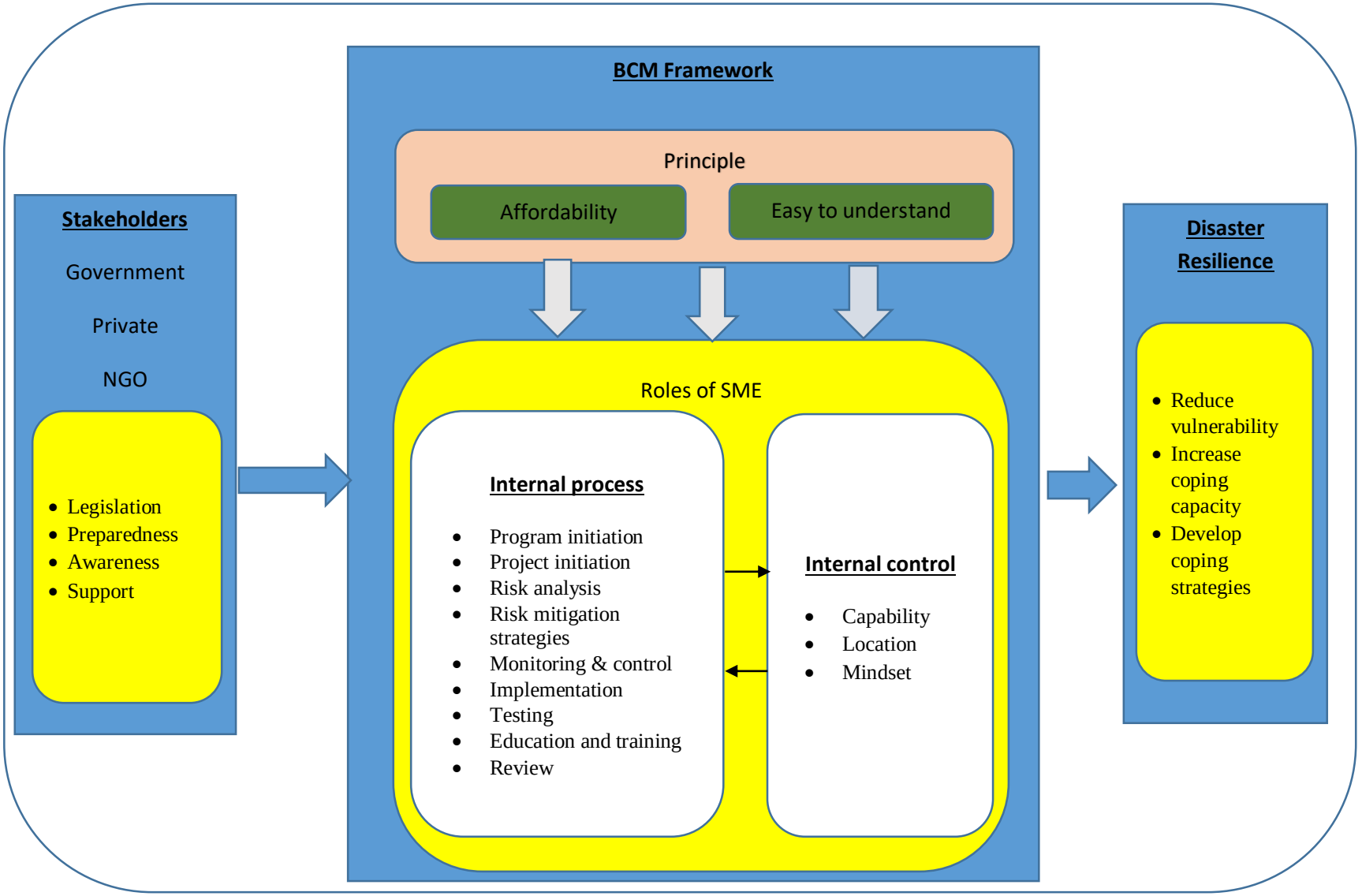

Figure 21: Proposed BCM framework for SMEs in Malaysia

8.6 Implementation of the framework

This section will discuss the implementation of the framework. The subjects to be checked here are 1) whether the framework can be implemented in Malaysia, and 2) potential issues that might arise in implementing this framework. The respondents were asked two questions in order to get their view on the subject matter. The two questions asked were:

- Based on your expertise and experience, do you think this proposed framework can be applied and suitable to be implemented in Malaysia?
- What are the issues to be addressed in order to implement the proposed framework in Malaysia?

8.6.1 Implementation: Can or cannot?

Based on the interviews, all respondents agreed that this framework can be implemented in Malaysia. However, all of them stated that there will be some issues arising in implementing the framework. The issues stated by the respondents will be discussed in the next section (Section 8.6.2).

8.6.2 Issues of concern

Although all the respondents agreed that the framework can be applied in Malaysia, there are a few concerns highlighted by the respondents in implementing the framework. The first issue is delivery, which means how the framework can reach the SMEs. This issue is related to the awareness of the framework among SMEs. This issue was highlighted by **V2** and **V3**, as they stated that most of the SMEs in Malaysia do not engage in programs organized by the government, so it is difficult to explain about the framework to them. Therefore, to deal with this problem, legislation can play a significant role, as stated in Section 5.3.3 and Section 5.5.1. If the government can introduce a law that required all the SMEs to comply with this framework, maybe the awareness level of SMEs in Malaysia can be increased. Meanwhile, **V1**

recommended the government to give incentives such as subsidy and training for SMEs implementing the framework in order to attract more SMEs to participate.

Legislation is another issue highlighted by the respondents. According to **V3**, proposing a new government legislation is not an easy job. It is time consuming because it needs approval from the highest level. Therefore, **V3** proposed that the framework be incorporated into an existing government policy, which is more realistic but still needs approval from the highest level. However, another issue is knowledge of the highest-level decision maker on the BCM. It is important to ensure the decision maker really understands what BCM is about and what can be done by BCM. Therefore, for this issue, **V3** proposed the need to educate the decision maker before this framework can be proposed to them.

8.7 Summary and link

Validation of a framework is important to ensure the framework can be implemented. This process is also useful to get views from different people on the proposed framework. In developing a framework, the framework needs to be revisited and necessary amendments need to be done. Accordingly, the purpose of this chapter is to validate the proposed conceptual framework. The validation process was done through expert interviews to get their opinions. The initial conceptual framework was proposed based on the literature review before some amendments were made after the main data collection phase. Once again, the conceptual framework was adjusted in the validation process.

Development of the BCM framework for SMEs in Malaysia is the final research objective of this research. The first four research objectives have been discussed in previous chapters. Therefore, the next chapter will develop conclusions of this research based on what has been done. The next chapter also will discover whether the research objectives of this research have

been achieved or not. At the same time, the next chapter will discuss the limitations faced throughout the research process.

CHAPTER 9

CONCLUSION

9.1 Introduction

This research was started by identifying the research gap through literature reviews. After the research gap was identified, the research questions and research objectives were developed. Then expert interviews were conducted in order to explore the research needs and to confirm the identified research gap. After that, a survey was distributed to SME owners in Malaysia to get their views on the research area. The results and findings of the interviews and survey were presented separately in Chapter 5 and Chapter 6 respectively.

Therefore, the purpose of this chapter is to synthesize the findings of the interviews and survey with the research objectives to develop a conclusion for each research objectives. In addition, this chapter will discover the contribution of the research and limitations arising in conducting this research. Finally, some recommendations and suggestions for further research are discussed.

9.2 Objectives of the study

The problem statements of this research have been presented in Section 1.3. Based on the problem statements, the research objectives were developed in Section 1.4 to support the aim of this research. The following sub-sections outline how each of those objectives was achieved in the study.

9.2.1 Research Objective 1

The first research objective was to *"Examine the impacts of natural hazard towards SMEs in Malaysia".* Due to their size and financial capabilities, SMEs have high levels of vulnerability towards disasters. Many studies have been done in correlating this issue around the globe (see Section 2.3.3). SMEs in Malaysia are also exposed to various natural hazards which contribute

to their vulnerability. However, not many studies on this were conducted in Malaysia (see Section 3.6).

The interviews conducted also confirmed that the impacts of natural hazard were bad due to their location, awareness level and low capability (see Section 5.2). In addition, results of the survey also show that the majority of SMEs agreed that the impacts of natural hazard to their business is very bad (see Section 6.5). Furthermore, it was found that the impacts of disaster not only affect SMEs' business, but also affect the personal properties of the business owner (see Section 6.5). Therefore, from the literature review, interviews and survey, research objective 1 is achieved by saying the impacts of natural disaster to SMEs in Malaysia are bad where they affect the overall business operations of the SMEs as well as personal properties of the SME owners.

9.2.2 Research Objective 2

The second research objective was *"Assess the roles of stakeholders such as government agencies, private companies and NGOs in supporting SMEs reducing the impacts of natural hazard in Malaysia".* In the event of disaster, usually the government is the most significant stakeholder (see Section 2.4). In Malaysia, the government also played significant roles such as in the declaration of emergency and major disasters status, drafting and implementing disaster management policies, as the source of funding, activating the federal response plan and emergency support functions by agencies at federal level (see Section 3.7.1). The government is also responsible for creating awareness and providing necessary training on disaster management. In addition to that, several studies discovered the roles of other stakeholders such as private companies (see Section 3.7.2) and NGOs (see Section 3.7.3). However, not many private companies in Malaysia are actively involved in supporting SMEs reduce the impacts of natural hazard in Malaysia, except financial institutions (see Section 5.5.7). In contrast, the roles of NGOs in Malaysia in the disaster management context are rarely

to be seen. Most of the NGOs are only involved in humanitarian assistance, and none of them actively participates in the preparedness phase (see Section 3.7.3). The SME owners also indicated that only government played a significant role in assisting them to reduce the impacts of natural hazard.

Therefore, based on the literature, interviews and survey, the government and private companies are the stakeholders that play significant roles in supporting SMEs to manage natural hazards in Malaysia. Their roles include drafting legislation, being a source of funding, providing emergency support and increasing awareness. The private companies can also provide financial incentives and share their expertise through training and all these roles can be done as part of their CSR. There are small roles played by NGOs but it is quite limited as a supporter to the government and private companies.

9.2.3 Research Objective 3

The third research objective was *"Identify SMEs perception of existing disaster risk reduction (DRR) programs in Malaysia."* Awareness and affordability are the main elements discussed in this research objective. The SME owners stated that they are aware of the potential disaster that might occur around them. However, poor information delivery from responsible parties made them not ready to take necessary actions (see Section 6.5). On the other hand, many of the SME owners admitted that they are not aware of the DRR programs in Malaysia. They assume the programs are not suitable for them and most of them assume the existing DRR programs in Malaysia will not help them to reduce their loss. In addition, the SME owners indicated that the existing DRR programs are costly and outside their budget. Because of this reason, they opted not to participate in the programs (see Section 6.6).

Therefore, the research objective 3 can be achieved by saying that most of the SME owners have bad and negative impressions or perceptions of the existing DRR programs in Malaysia. SMEs in Malaysia need more DRR programs that are suitable for them and within their budget.

9.2.4 Research Objective 4

The fourth research objective was *"Assess the key issues that affect the disaster resilience of SMEs to natural hazards"*. Based on the literature, interviews and survey, many factors contributed to the disaster resilience of the SMEs. The findings found the seven main key issues that affect the disaster resilience of SMEs in Malaysia. The seven key issues are '**Legislation**', '**Preparedness**', **Low capability'**, '**Location**', '**Mindset**', '**Awareness**' and '**Support**'. Detailed discussion of these key issues has been made in Section 7.5. Based on the discussions in Section 7.5, it can be concluded that all stakeholders, the government, private companies and NGOs, and also SMEs themselves contribute to the factors that determine the disaster resilience of SMEs. Some of the key issues are roles of the government, private companies and NGOs, while there are also roles played by the SMEs themselves.

9.2.5 Research Objective 5

The final research objective was *"Develop and recommend a BCM's framework as a DRR approach for SMEs in managing disasters in Malaysia."* An initial BCM conceptual framework was developed based on the literature review (Figure 2). Then the initial conceptual framework was extended based on the data obtained from the interviews and survey (Figure 20). Then once again the proposed conceptual framework was revisited for a validation process before the conceptual framework was proposed as Figure 21. Therefore, the development of the framework and the guidelines indicated that research objective 5 has been achieved.

9.3 Contribution of the research

The contribution of this research can be seen theoretically and practically. The following sub-section will discover the contribution gained from the research.

9.3.1 Disaster resilience of SMEs

As stated previously, SMEs in Malaysia are vulnerable to disasters and have low resilience. Therefore, this research is expected to explore this issue and the solutions provided in dealing with this issue might assist SMEs in Malaysia. In addition, not many studies were conducted in Malaysia to access the key issues that determine the disaster resilience among SMEs in Malaysia. This research can become pioneering in this area which may attract further research.

9.3.2 BCM for SME

BCM is an uncommon term among SMEs in Malaysia. Usually the term BCM is used by big companies and financial institutions. However, this research is the first research to explore the potential of BCM as a DRR approach for SMEs in Malaysia. The outcome of this research is to provide options for SMEs to reduce the disaster risk by using BCM.

9.3.3 Conceptual framework

The conceptual framework and the BCM guidelines for SMEs proposed in this research are the first framework developed for SMEs in dealing with natural hazards. The framework not only showed the roles to be played by the SMEs, but also roles of other stakeholders. In addition, the framework also provides benchmarks for SMEs in achieving disaster resilience.

9.3.4 Literature

This research will provide more literature in the research area. Currently, literature in this subject area is quite limited, especially for Malaysia. Therefore, this research is expected to provide additional literature for researchers who are interested in doing research in this area.

9.4 Limitations of the study

There are a few limitations observed from this research, as described in the following sub-sections.

9.4.1 SME database

The survey of this research was conducted online. The questionnaire for the survey was sent to the respondents using an online survey application. The list of the SMEs was derived from the SMECorp Malaysia's database. Currently, it is the only database on SME available in Malaysia. However, the database only contained the information of SMEs who came to SMECorp Malaysia for business advisory or assistance. Therefore, the database does not represent all small businesses in Malaysia.

9.4.2 Sample size

Sample size is another limitation to be addressed. For this research, a total of 1223 questionnaires were distributed to SMEs in the whole country. The questionnaire was distributed online direct to the email address provided in the SMECorp Malaysia's database. The respondents were given up to two months to complete the survey and five courtesy reminders by emails and phone calls were made up. As a result, 139 responses were received which indicated 11.37% of the number of the distributed questionnaires. However, from the 139 responses, 12 responses were excluded because their business did not come within the definition of SME provided by the SMECorp. Therefore, 127 (10.38%) questionnaires were available for analysis. In addition, not all of the respondents have experience in disaster. Some of them indicated that they have no disaster experience. This situation might affect some of the research objectives, such as in evaluating SMEs' perception of existing DRR programs.

However, some literature states that the figure is enough for a research study (see Section 6.1). Most of the quantitative analysis was done on the SMEs affected by natural disasters in the last five years.

9.4.3 Validation process

Another limitation for this research is the validation process. The proposed conceptual framework was validated by expert interviews. Five experts with different backgrounds were identified, contacted and confirmed participation, However, out of the five respondents, only three of them participated while another two had to cancel the interview because of other commitments. Replacement candidates were identified and contacted but none of them replied or agreed to participate.

9.5 Recommendations

Based on the findings of this research, several recommendations are proposed for all parties related to this research. The recommendations are outlined below:

9.5.1 Training and awareness programs

More training and awareness programs for SMEs should be conducted by the related stakeholders. The purpose of the programs is to develop disaster preparedness elements for SMEs. As stated before, BCM and disaster management are a new area for SMEs in Malaysia. Most SMEs in Malaysia do not participate in any DRR programs and their disaster preparedness level is also low. Therefore, conducting the training and awareness for SMEs in the context of disaster management is useful for SMEs. The programs can be conducted by the government and private companies as part of their CSR. However, the cost of the programs must be affordable and within the SMEs' budget. The government can also provide financial incentives such as subsidy for SMEs to participate in such programs.

On the other hand, stakeholders need to develop more outreach programs in order to increase SMEs' awareness on the supports provided. Many supports including financial and non-financial support have been introduced by the government agencies and private companies but the SMEs are not aware of these supports. SMEs should take advantage of the business advisory, grants and soft loans provided by government agencies and they also have other options, to get soft loans and disaster related insurance from private companies.

9.5.2 Financial incentives

Many financial incentives are available to help SMEs in Malaysia. However, some of them are quite expensive and difficult to apply for. Many SMEs in Malaysia refused to buy insurance to cover their business from disasters because the insurance premium is very expensive and beyond their budget. They also refused to apply for loans from financial institutions because of high interest rate. On the other hand, the SMEs failed to apply for the financial incentives provided by the government because of the lengthy and difficult process. The SMEs also felt that most of the financial incentives provided by the government and private companies are actually not for them.

Therefore, the government and the private companies should provide financial instruments that are more suitable for SMEs. The price of the existing financial products should be reduced because money is the main problem for SMEs in Malaysia. Maybe the government should introduce social insurance for SME owners to protect their business.

9.5.3 Education

BCM is a new area among SMEs and the government. Currently, only big private companies in Malaysia are familiar with it. Therefore, it is important to educate SMEs and also the government on the BCM topic. In developed countries such as UK and Japan, BCM is one of

the approaches for SMEs in dealing with disasters. However, before the same situation can be applied in Malaysia, the SMEs and government must become familiar with it.

9.5.4 Information delivery

Many SMEs in Malaysia indicated that they failed to take necessary actions prior to natural disasters because of weak information delivery by the related agencies. According to the SMEs, they usually received information on disasters occurring around them quite late and the time given for them to make preparations was insufficient. Therefore, it is important for the related agencies to reevaluate their standard of procedure in delivering information. Usage of social media might be useful now.

9.5.5 Legislation

Currently, the only disaster management policy in Malaysia is the Malaysia NSC Directive No. 20. However, the focus of this policy is on roles to be played by the government agencies during disaster. Not many preparedness issues are covered by the policy. Therefore, the government should draft a new policy or amend the existing policy to incorporate the preparedness issues.

There is no regulation in Malaysia that requires SMEs to register their business with any particular government agency. This situation makes it difficult to establish an SME database in Malaysia and to impose regulation on them. Therefore, the government should appoint a regulator for the SMEs and introduce a new regulation that requires all SMEs to register with the regulator. If this can be done, the government can ensure that SMEs comply with the government regulations and an SME database can be set up.

9.6 Further research

9.6.1 Research on effectiveness of the BCM framework

After the framework has been implemented, it is important to do further research to check the effectiveness of the framework to SMEs in Malaysia. The research can be done by getting data from SMEs before and after they implement the BCM framework. Maybe a case study can be done to check the effectiveness of the proposed framework.

9.6.2 Research on the details of the proposed framework

Another research study needs to be done in order to improve the contents of the proposed framework. Usually, when something new was imposed, it was difficult to identify the weakness except after a certain period of the implementation. Therefore, further research is useful in order to improve the contents of the framework and at the same time, to match the contents of the framework with the SMEs' needs.

9.6.3 Case study research in different countries

Similar case studies can be done in other countries. Different countries have different features. Natural hazards in other countries may be different to the natural hazards in Malaysia. In addition, profiles of SMEs in other countries are not similar to SMEs in Malaysia because every country has a different definition of SMEs. Therefore, it is interesting if a similar case study can be done in other countries because it can provide another option for SMEs in the country to mitigate their disaster risks.

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Woldu, E., & Ponnala, D. V. (2011). Impact of working capital management on profitability of small and medium scale enterprises (SMEs) in Addis Ababa. Addis Ababa University. Retrieved from http://hdl.handle.net/123456789/3161

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APPENDIX I: INTERVIEW GUIDELINES

INTERVIEW GUIDELINE

Research title: ***Framework of Business Continuity Management (BCM) as a Disaster Resilience Approach for Small and Medium-Sized Enterprises (SMEs) in Malaysia***

Aim and objective of the study

This interview is conducted based on an on-going PhD research that aims evaluate the business resilience of Small and Medium-Sized Enterprises (SMEs) in Malaysia towards natural disasters through a Business Continuity Management (BCM) approach.

The specific objectives are:

- Examine the impact of natural disasters on SMEs in Malaysia;
- Assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs to reduce the impact of natural disaster in Malaysia;
- Identify SMEs' perception of existing DRR programmes in Malaysia;
- Assess the key issues that affect the disaster resilience of SMEs to natural disasters; and
- Develop and recommend a BCM best practices guide as a DRR approach for SMEs in Malaysia.

Commitment anticipated from respondent

- Discussion regarding current situations and practices of BCM among SMEs; and
- Interviewee will be requested to check validity of interview transcripts produced by the researcher.

Consideration of confidentiality

- All interview materials will be kept strictly confidential and will only available to the supervisor of this research in University.
- Only aggregated results of this study will be used in any publication.

Details of the Researcher

Zairol Azhar Auzzir
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Supervisor

Professor Richard Haigh
E-mail: R.Haigh@hud.ac.uk
Tel: +44 148 4473038

Research title: **Framework of Business Continuity Management (BCM) as a Business Resilience Approach for Small and Medium-Sized Enterprises (SMEs) in Malaysia**

Preamble

This study focuses on the use of BCM in addressing disaster risk reduction (DRR) for small and medium sized enterprises (SME). In this study, SME is defined as:

- Manufacturing: Sales turnover not exceeding RM50 million OR full-time employees not exceeding 200 workers
- Services and other sectors: Sales turnover not exceeding RM20 million OR full-time employees not exceeding 75 workers

A business will be deemed as an SME if it meets either one of the two specified qualifying criteria, namely sales turnover or full-time employees, whichever is lower.

Instructions

Thank you for agreeing to take part in this research. Your answers will be held in strict confidence and will not be reported within your organisation.

Interview Questions

Section A: Respondent profiles

- Organisation:
- Name: What is your job title?
- What primary functions does your job involved?
- Can you briefly explain your related experiences in this research area?

Section B: Impacts of disaster to SME

- Based on media and government reports, SME are exposed to natural disasters. That means the SME have high vulnerability towards natural disaster. Could you comment on this issue?
- Why the impacts of disaster are higher for SME compared to bigger firms?
- What approaches can be used by SME in dealing with the impacts of disaster?

Section C: Business Continuity Management (BCM)

- Do you familiar with the term BCM?
- As you know, is it any BCM framework or guideline currently provided by the government or any other parties for SME in Malaysia?
- Based on literature reviews in this topic, governments of developing countries are not interested to engage in this issue. Based on your experience, what are factors those contributed to this problem?

- Literature reviews also suggested that BCM is a strategically approach of managing disaster among SME. In your opinion, what are the roles can be played by the government in enhancing the BCM implementation among SMEs in Malaysia?
- Besides the government, what are the other parties who can involve?
- How about NGO or other parties?

Section D: Final comments

- In your opinion, what are other factors or elements need to be considered in implementing BCM framework to SMEs in Malaysia?

Thank you for participating in this interview session.

APPENDIX II: INTERVIEW GUIDELINES FOR VALIDATION PROCESS

Research title: ***Framework of Business Continuity Management (BCM) as a Business Resilience Approach for Small and Medium-Sized Enterprises (SMEs) in Malaysia***

Aim and objective of the study

This interview is conducted based on an on-going PhD research that aims evaluate the disaster resilience of Small and Medium-Sized Enterprises (SMEs) in Malaysia towards natural disasters through a Business Continuity Management (BCM) approach.

The specific objectives are:

- Examine the impact of natural disasters on SMEs in Malaysia;
- Assess the roles of external parties such as government agencies, private companies and NGOs in supporting SMEs to reduce the impact of natural disaster in Malaysia;
- Identify SMEs' perception of existing DRR programmes in Malaysia;
- Assess the key issues that affect the disaster resilience of SMEs to natural disasters; and
- Develop and recommend a BCM best practices guide as a DRR approach for SMEs in Malaysia.

Commitment anticipated from your firm

- Discussion on the research topic and the reliability of the proposed framework;
- Provide new idea and input to improve the proposed framework where appropriate; and
- Interviewee will be requested to check validity of interview transcripts produced by the researcher.

Consideration of confidentiality

- All interview materials will be kept strictly confidential and will only available to the supervisor of this research in University.
- Only aggregated results of this study will be used in any publication.

Details of the Researcher

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Supervisor

Professor Richard Haigh
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Tel: +44 148 4473038

Research title: **Framework of Business Continuity Management (BCM) as a Disaster Resilience Approach for Small and Medium-Sized Enterprises (SMEs) in Malaysia**

Preamble

This study focuses on the use of BCM in addressing disaster risk reduction (DRR) for small and medium sized enterprises (SME). In this study, SME is defined as:

- Manufacturing: Sales turnover not exceeding RM50 million OR full-time employees not exceeding 200 workers
- Services and other sectors: Sales turnover not exceeding RM20 million OR full-time employees not exceeding 75 workers

A business will be deemed as an SME if it meets either one of the two specified qualifying criteria, namely sales turnover or full-time employees, whichever is lower.

Instructions

Thank you for agreeing to take part in this research. Your answers will be held in strict confidence and will not be reported within your organisation.

Interview Questions

Section A: Respondent profiles

- Organisation:
- Name:
- What is your job title?
- What primary functions does your job involve?

Section B: Discussion on the research area

- Do you think that the research topic is significance to be explored right now?
- Is it any special issues you want to highlight regarding this research?

Section C: Research framework

- Appendix 1 is a research framework proposed for this research. This proposed framework was developed based on the data collected from a survey and interviews. Can you give a look and give your opinion about the proposed framework? You are free to add or to amend the proposed framework.
- Based on your expertise and experience, do you think this proposed framework can be applied and suitable to be implemented in Malaysia?
- What are the main issue to be addressed in order to implement the proposed framework in Malaysia?

Thank you for participating in this interview session.

APPENDIX III: QUESTIONNAIRE FOR THE SURVEY

Participant Information Sheet

Research Project Title: Framework of Business Continuity Management (BCM) as a Disaster Resilience Approach for Small and Medium-Sized Enterprises (SMEs) in Malaysia.

You are being invited to take part in a research project. Before you decide, it is important for you to understand why this research is being done and what it will involve. Please take time to read the following information and discuss it with others if you wish. Ask if there is anything that is not clear or if you would like more information. May I take this opportunity to thank you for taking time to read this.

What is the purpose of the project?
The research project is intended to provide the research focus for a module which forms part of my degree. It will attempt to evaluate the business resilience of Small and Medium-Sized Enterprises (SMEs) in Malaysia towards natural disasters through a Business Continuity Management (BCM) approach

Why have I been chosen?
You have been chosen because your business is deemed as a SME as stated in the definition provided by the Malaysian SME Corporation in 2013. In addition, your business information is obtainable in the SME Corp's database.

Do I have to take part?
Participation on this study is entirely voluntary, so please do not feel obliged to take part. Refusal will involve no penalty whatsoever and you may withdraw from the study at any stage without giving an explanation to the researcher.

What do I have to do?
You will be invited to take part in a questionnaires survey. This should take no more than 20 minutes of your time.

What are the benefits to taking part?
This questionnaire survey is important in order to (1) develop a new BCM framework which can be used by SMEs to increase their business resilience; (2) identify the key issues that affect the business resilience of SMEs to natural disasters; and (3) encourage awareness of SMEs in Malaysia to existing disaster risk reduction (DRR) programmes in Malaysia.

Are there any disadvantages to taking part?
There should be no foreseeable disadvantages to your participation. If you are unhappy or have further questions at any stage in the process, please address your concerns initially to the researcher if this is appropriate. Alternatively, please contact the project supervisor, Professor Richard Haigh at the Global Disaster Resilience Centre, School of Art, Design and Architecture, University of Huddersfield.

Will all my details be kept confidential?
All information which is collected will be strictly confidential and anonymised before the data is presented in any work, in compliance with the Data Protection Act and ethical research guidelines and principles.

What will happen to the results of the research study?
The results of this study will be written up in the project thesis titled **Framework of Business Continuity Management (BCM) as a Business Resilience Approach for Small and Medium-Sized Enterprises (SMEs) in Malaysia.** If you would like a copy please contact the researcher.

What happens to the data collected?
The data will be kept at high confidentiality. Only the researcher and supervisor can assess to the data. Only anonymous data will be reported in the thesis and other publications related to this study.

Will I be paid for participating in the research?
Participation on this study is entirely voluntary, therefore no payment will be paid for participating in the research.

Who has reviewed and approved the study, and who can be contacted for further information?
If you require further information or any clarification, please contact me or my supervisor via the contact details stated below

Details of the Researcher

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Supervisor

Professor Richard Haigh
E-mail: R.Haigh@hud.ac.uk
Tel: +44 148 4473038

Definitions applicable to the study

Business continuity management - A management process of identifying the ability of an organisation to continue delivery of products or services at acceptable predefined levels following a disruptive incident

Business resilience – ability of a business to respond flexibly to a changing environment, overcome unexpected shocks and remain competitive

Section I: General Information

1. Your position:

2. Which of the following best describes the industry sector in which your business operates?:
    - Agricultural, hunting and forestry, fishing
    - Mining and quarrying
    - Electricity, gas and water supply
    - Manufacturing
    - Construction
    - Wholesale and retail trade, repair
    - Hotels and restaurants
    - Transport, storage and communication
    - Financial intermediation
    - Real estate, renting and business activities
    - Education
    - Health and social work
    - Other (please specify) _____

3. How many people are employed by your organisation?
    - 0 (sole trader)
    - 1 – 9
    - 10 – 75
    - 76 – 200
    - Over 200

4. What is the annual turnover of your business (approximately)
    - Less than RM500,000
    - RM500,001 – RM20,000,000
    - RM20,000,001 – RM50,000,000
    - Over RM50,000,000

5. Is your organisation a?
    - Sole trader
    - Partnership
    - Company
    - Other (please specify) _____

6. Regarding your business premises, do you?
    - Own freehold premises
    - Rent premises
    - Lease premises
    - Work from home
    - Other (please specify) _____

Section II: Impacts of natural disasters

7. Was your business affected / influenced by any natural disaster during last 5 year?
    - Yes

- No

If your business was not affected by any natural disaster, please go to the question number 15

8. Was your business affected / influenced by any natural disaster during last 5 year?

	Very much affected	Much affected	Somewhat affected	Affected a little	Not affected at all
Floods					
Storms / hurricanes					
Heat waves					
Haze					
Landslides					
Drought					
Other (please specify)					

9. Please indicate the years in which those natural disasters affected your business (indicate more than one year if applicable. E.g. 2013, 2014)

	Year
Floods	
Storms / hurricanes	
Heat waves	
Haze	
Landslides	
Drought	
Other	

10. What were the effects experienced by your business due to the above natural disasters? (Please indicate all that are applicable)
    - Loss of sales / production
    - Disruptions to access to premises
    - Increase in costs
    - Increase in insurance cost
    - Decrease in turnover / profit
    - Increase in turnover / profit
    - Damage to property / business premises
    - Increase in sales / production
    - Damage to stocks and equipment
    - Decrease in cost
    - Disruption to supply chain
    - Increase in stakeholder reputation
    - Physical / health impacts on employees
    - Decrease in insurance premium
    - Non attendance of employees
    - Premises relocation

- Employees leaving the business
- Other (please specify) _____

11. How would you rate the following statements in relation to your business's experience of natural disasters?

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
The impact of the natural disaster was very bad to my business					
My business was aware of a natural disaster occurring in the locality					
Adequate information / warning was received prior to the occurrence of the natural disaster					
Sufficient lead time was available to take action upon receiving information / warning					

Section III: Existing DRR programs in Malaysia

12. If your business was previously affected by a natural disaster, did you receive any assistance / support from any party to recover from its effects and continue business operations?
    - Yes
    - No
    - No support was required
    - Other (please specify) _____

13. If you received any assistance / support, from where did you receive such assistance / support? (Please indicate all that are applicable)
    - Government agency such as TEKUN, MARA etc.
    - Politicians
    - Local authority
    - Financial company (bank, insurance etc)
    - Emergency services
    - Local utility companies
    - Environment agency
    - Trade association or other business network
    - Supply chain members / customers
    - Neighbouring businesses
    - Neighbouring households
    - Family and relatives
    - Non-government organisation (NGO)
    - Other (please specify) _____

14. How would you rate the assistance received from them?

	Strongly satisfy	satisfied	Don't know	dissatisfied	Strongly dissatisfied
Government agency					
Politicians					

Local authority					
Financial company					
Emergency services					
Local utility companies Environment agency					
Trade association or other business network					
Supply chain members / customers					
Neighbouring businesses					
Neighbouring households					
Family and relatives					
NGO					
Other (please specify)					

15. Are you aware any disaster risk reduction (DRR) program for SME in Malaysia?
    - Yes
    - No

    If no, please go to the question number 18

16. How would you rate the following statement in relation to the DRR programs in Malaysia?

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
My business participated in any DRR programs in Malaysia					
DRR programs in Malaysia are suitable for SME					
DRR programs in Malaysia are important in assisting SME dealing with disasters					
DRR programs in Malaysia help me a lots after my business was hit by disaster					
Besides the government, private sector also has conducting DRR programs					

17. In your opinion, besides government and private companies, what are the other parties should participate in the DRR programs? _____

Section IV: Business resilience and business continuity management (BCM)

18. What are the steps that you have already taken to protect your business against the effects of natural disaster? (Please indicate all that are applicable)
    - Obtaining property insurance
    - Obtaining business interruption insurance
    - Developing a business continuity plan
    - Premises improvements

- Installing anti-disaster devices
- Planning your supply chain to minimise disruptions
- Relocation of your business premises
- Stock / equipment relocation
- Backing up your business data in another location
- Developing an emergency plan
- No step has been taken up to now
- Other (please specify) _____

19. What are the steps that you may consider to take to protect your business against the effects of future natural disasters? (Please indicate all that are applicable)
    - Obtaining property insurance
    - Obtaining business interruption insurance
    - Developing a business continuity plan
    - Premises improvements
    - Installing anti-disaster devices
    - Planning your supply chain to minimise disruptions
    - Relocation of your business premises
    - Stock / equipment relocation
    - Backing up your business data in another location
    - Developing an emergency plan
    - No step will be taken
    - Other (please specify) _____

20. If you have not taken any steps up to now or may not take any step in future to protect your business against natural disasters, please indicate why?
    - Do not foresee any natural disaster to affect the business in future
    - Impacts of natural disasters are not significant enough to warranty any action
    - Too costly
    - Lack of expertise
    - Lack of information
    - Information available are too complicated
    - Protection measures are too complicated
    - Too much workload
    - Currently evaluating options available
    - Other (please specify) _____

21. If your business decides to implement protection measures against natural disasters in future, who is likely to carry out these measures for you?
    - The business itself
    - The business with the help of another party
    - Another party
    - Other (please specify) _____

22. If a natural disaster affects your business in future, from where do you expect to receive assistance / support to recover from its effects and continue your business as usual? (Please indicate all that are applicable)
    - Government agency such as TEKUN, MARA etc.

- Politicians
- Local authority
- Financial company (bank, insurance etc)
- Emergency services
- Local utility companies
- Environment agency
- Trade association or other business network
- Supply chain members / customers
- Neighbouring businesses
- Neighbouring households
- Family and relatives
- Non-government organisation (NGO)
- Other (please specify) _____

23. How would you rate the following statement in relation to the business resilience and BCM?

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
My business is resilient towards natural disasters					
I can continue my business immediately after it is being hit by disasters					
I have enough fund to continue my business after it is being hit by disasters					
Business resilience is an important element for my business					
I'm familiar with the term 'Business Continuity Management'					
I understand the concept of BCM					
I believed BCM is useful for my business					
My business needs a BCM framework					
I believed BCM would help my business dealing with disaster					
Establishment of BCM framework would reduce the impacts of disaster to my business					
I implement BCM in my business					
My business has capability to establish a BCM framework					
My business has financial capabilities and expertise to draft BCM framework					
I willing to allocate certain fund to establish BCM framework for my business					

I would like to participate in BCM training session conducted by government (if any)					
Government should establish a BCM framework for SME					

Future involvement and comments

23. Please indicate the state in which your business is located.
    - Perlis
    - Kedah
    - Pulau Pinang
    - Perak
    - Selangor
    - Negeri Sembilan
    - Melaka
    - Johor
    - Pahang
    - Terengganu
    - Kelantan
    - Sarawak
    - Sabah
    - Wilayah Persekutuan (Kuala Lumpur, Putrajaya dan Labuan)

24. Please select from the following options if you would like;
    - To receive more information about the research
    - To receive findings and results of the research
    - To participate in a future survey in relation to this research

25. If you have selected any of the options in **Question 24** above, please provide your preferred contact details:
    Address:
    Telephone:
    Email:

26. If you have any other comments please provide below.
    _____
    _____
    _____

Thank you

Thank you for your kind cooperation and assistance to make this research study a success.