

# **Understanding the resilience of small and medium-sized enterprises to flood risk in Ayutthaya, Thailand**

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## LIST OF ABBREVIATIONS

ADRC	Asian Disaster Reduction Centre
APEC	Asia-Pacific Economic Cooperation
AUTEC	Auckland University of Technology Ethics Committee
BCP	Business Continuity Plan
CRED	Centre for Research on the Epidemiology of Disasters
EAP	Environment Protection Agency
EC	European Commission
IDPC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
ISDR	International Strategy for Disaster Reduction
OECD	Organisation for Economic Co-operation and Development
OSMEP	The Office of SMEs Promotion
PAO	Provincial Administration Organisation
SAO	Sub-District Administration Organisation
SMEs	Small and Medium-sized Enterprises
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNISDR	United Nations International Strategy for Disaster Reduction

## ATTESTATION OF AUTHORSHIP

“I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the qualification of any other degree or diploma at a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.”

Signed: \_\_\_\_\_

Boonyarit Saengnakhon

Date: \_\_\_\_\_

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## ABSTRACT

Thailand has experienced several flood events during recent years. The rate of such events is forecast to increase in the future due to the geographic and climatic characteristics of the country. While businesses, in general, are affected by major disruptions from flooding, Small, and Medium-sized Enterprises (SMEs) are particularly vulnerable as they have limited resources with which to prepare, respond, and recover from flooding, in comparison to their larger counterparts. This dissertation aimed to assess the resilience of SMEs for flood risks, and understand the current measures taken by these organizations to adapt, prevent, and limit the adverse impacts of flooding on their business activities. The research focuses on SMEs in Ayutthaya province, Thailand. The data was collected through mixed methods, using a questionnaire-based survey and two semi-structured interviews, followed by qualitative (qualitative description and cognitive map) and quantitative analysis (specific values, highest and lowest values, and trends over time, proportions, and distributions). The results indicated that SMEs were likely to experience a range of impacts from flood events. Of these, the indirect impacts of flooding were relatively higher and encompassed impacts such as product and service disruptions, travel difficulties for customers and staff, and supply chain disruptions. A majority of SMEs opted for flood coping strategies, including at least one measure of flood protection against the impacts of flooding events. The research also identified a number of key elements that affect the coping capacity of SMEs to flood risks, such as the size of business, previous experience of floods, and the perception of senior management or business owners. The main conclusion of this study is that SMEs are likely to have a lack of coping strategies and adopt various methods of addressing flood risks. However, vulnerability, coping strategies, and coping capacity have to be enhanced, in conjunction with the lessons learned from previous flooding experiences, to address the weaknesses of their organizations in effectively minimizing the potential impacts of future flood risk.

## CHAPTER 1 – INTRODUCTION

The purpose of this study is to investigate small businesses' adaptation to flood risk. This chapter will discuss the current strategies used by Small and Medium-sized Enterprises (SMEs) to enhance resilience to flood risk, with regard to organizational level measures; individual-level property protection; business continuity; and resilience measures. This chapter begins by providing the background information on the key terms that will be used throughout this study. It will proceed to discuss the rationale for choosing the research topic, research objectives, research question, and present the structure of the dissertation.

### 1.1 Background and Definition of Key Terms

SMEs contribute to almost all business sectors, throughout Thailand, at grassroots levels and, therefore, play a major role in the vitalization and development of the nation's economy (Srivihok & Intrapairot, 2004). Presently, there is no universal definition for SMEs; and given that SMEs come in various shapes and sizes, it is difficult to draw a precise line between small and large enterprises. The SME definition, adopted by the European Commission (EC), is a practical tool that enables SMEs to identify themselves in order to access the full support of governance relationships, such as financial and operational support (The European Union, 2015).

#### *1.1.1 SME Definition by the European Commission (EC)*

A definition for SMEs was introduced by the EC in May 2003, which categorized SMEs into three groups: medium, small and micro-enterprises. Several main factors were considered in defining SMEs, including the number of employees, turnover, balance sheet total, and level of independence (The European Union, 2003). However, if a small enterprise has access to significant resources, it might not be eligible for SME status; for example, when a small enterprise is linked to, owned by, or in partnership with, a larger enterprise (The European Union, 2015). Table 1 (p. 2) shows the criteria applicable for the EC definition of an SME.

*Table 1.* The criteria applicable for the definition of SME as provided by the European Commission

<b>Company Category</b>	<b>Staff headcount</b>	<b>Turnover</b>	<b>Balance Sheet total</b>
Medium-sized	< 250	≤ € 50 m	≤ € 50 m
Small	< 50	≤ € 10 m	≤ € 10 m
Micro	< 10	≤ € 2 m	≤ € 2 m

Source: (The European Union, 2015)

### *1.1.2 SME Definition by the Thai Government*

The Ministry of Industry of Thailand introduced a further definition for SMEs on September 11, 2002. This is primarily based on fixed capitals and the number of salaried workers. Accordingly, an enterprise is classified as an SME if it has a fixed capital of less than 1.4 million USD and less than 200 employees, and has no ownership of lands or buildings. Table 2 shows the categorization used for SMEs in Thailand, which is based on four criteria: production, service, trading, and retail (OSMEP, 2012).

*Table 2.* The criteria applicable for the definition of SME, provided by the Ministry of Industry, Thailand

<b>Type</b>	<b>Small</b>		<b>Medium</b>	
	<b>Employees</b>	<b>Capital (million \$USD)</b>	<b>Employees</b>	<b>Capital (million \$USD)</b>
Production	Not more than 50	Not more than 1.4	51-200	1.4-5.6
Service	Not more than 50	Not more than 1.4	51-200	1.4-5.6
Wholesale	Not more than 25	Not more than 1.4	26-50	1.4-5.6
Retail	Not more than 15	Not more than 1.4	16-30	1.4-5.6

Note: Exchange rate at 35 Baht: 1 US dollar

Source: (OSMEP, 2012)

Additionally, other qualitative features can be useful in classifying SMEs; for example, the ownership, decision-making processes, and how the organization is managed. These features contribute to the understanding of the underlying causes of the resilience of SMEs to climate change (Kuruppu, Murta, Mukheibir, Chong, & Brennan, 2013). Hauser (2005) discussed the different decision-making processes, which are important aspects in differentiating between SMEs that are independent and those that are associated with a large business group. Such qualitative features give rise to three types of SMEs (Hauser, 2005):

*Table 3.* The classification of SMEs by qualitative features

Type	Definitions
<b>1. Family enterprises</b>	The manager and family members own the enterprise and take short and long-term decisions
<b>2. Enterprises with a board of owners</b>	The manager takes short-term decisions but submits long-term decisions to the board of owners
<b>3. Enterprises belonging to an enterprise group</b>	The head office of the group takes strategic decisions, considering the maximization of the profits of the whole group

Source: (Kuruppu et al., 2013)

### *1.1.3 Climate Change and Natural Disasters in Thailand*

Globally, the general trend for the occurrence of natural disasters is on the increase. The data recorded by the global disaster database, maintained by the Centre for Research on the Epidemiology of Disasters (CRED) in Brussels, Belgium, reveals over 130 disasters to have occurred across 68 countries in 2015. The effects of which resulted in 15,143 deaths and impacted over 15 million people, causing more than 13 billion USD worth of damage (CRED, 2015). In Thailand, flooding was the most frequent type of natural disaster that occurred during the last two decades. Figure 1 (p. 4) shows the total number of various natural-related disaster events that occurred annually in Thailand, from 1970 to 2015. Of these, as shown in Figure 2 (p. 4), flooding occurred with the highest frequency compared to all other types of natural disasters.

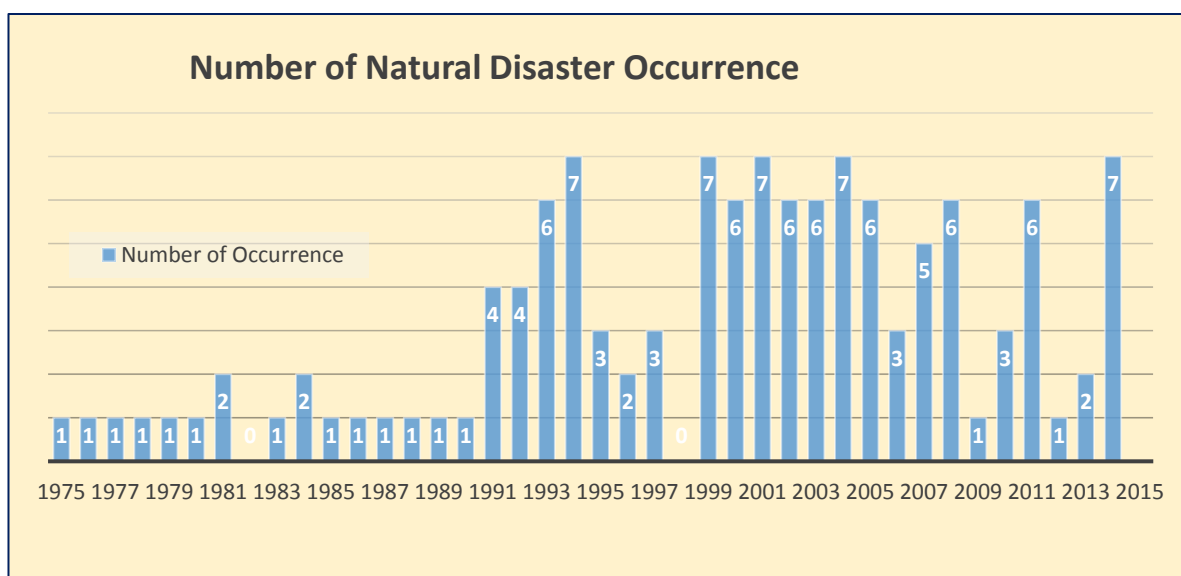


Figure 1. Occurrence of natural disaster events in Thailand from 1970-2015(CRED, 2015)

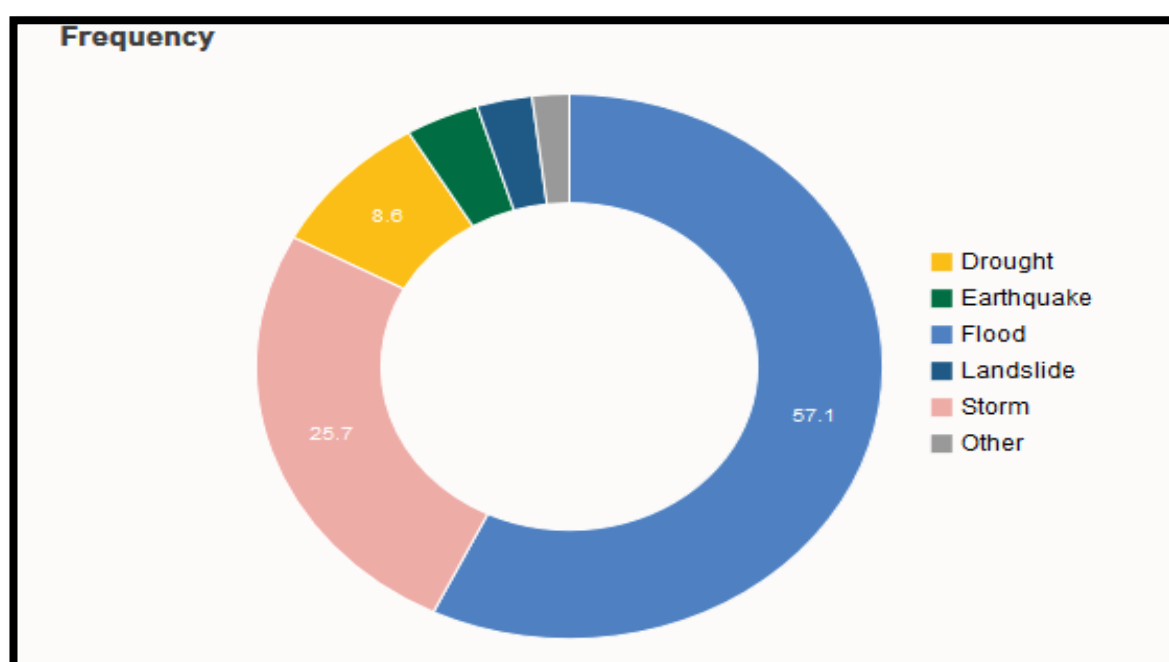


Figure 2. Decomposition of disaster occurrence in Thailand from 1970-2015(CRED, 2015)

#### 1.1.4 The Impact of Flooding in Thailand

In 2011, the worst-case flooding in over 50 years affected Thailand's northern, northeastern, and central regions, disrupting business and society across all levels. Sixty-six out of Thailand's 77 provinces were affected, resulting in an economic disruption of approximately 45 billion USD or 13 percent of that year's GDP (BSR, 2015). According to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), the mean annual precipitation and extreme precipitation of

Thailand is predicted to increase further in the future (IPCC, 2014). Given that flooding results from natural factors, especially climate change, coupled with human-made changes (such as land-use and water management), the increased intensity and frequency of such weather extremes are predicted to increase the risk of flooding (Ingirige & Amaratunga, 2013). For example, Thailand's Intended Nationally Determined Contribution (IDPC) reported Thailand to be classified as one of the 16 countries worldwide that are in the "extreme risk" category on the climate change vulnerability index. This indicates that Thailand is highly vulnerable to adverse impacts of climate change that could occur over the next 30 years (INCD, 2015). The 2015 IDPC report further revealed that while the number of rainy days from 1955-2014 has significantly decreased in the country, by 0.99 mm per day for every decade, the daily rainfall intensity has increased. Heavier rainfalls are expected in regions with high precipitation levels. Therefore, severe flooding is expected in the future throughout the country (INDC, 2015).

#### *1.1.5 The Impacts of Flooding on SMEs*

SMEs play a significant role in the Thai economy and are the key driver of innovation and technological development throughout the country (ADRC, 2012). However, flooding has a significant risk profile and repeatedly occurs in Thailand. Therefore, for the present study, while examining the impact of flooding on the country as a whole, a special focus is given to its impact on SMEs.

Several studies are available that explore the impacts of flooding on SMEs. A report by EKOS Consulting (2008), identified a range of flood impacts experienced by SMEs, based on the 2007 summer floods in the United Kingdom (UK). These include damage to premises and equipment, inability to conduct business, and inconvenience to the staff. A more recent study, conducted by Ingirige and Wedawatta (2011), also in the UK, identified that non-attendance of staff, loss of sales, damage to property, and a decrease in profits were the most common extreme weather effects experienced by SMEs. However, given that the latter study was aimed at identifying implications of extreme weather events, including extreme heat waves, severe storms, floods, and droughts, the findings reflect outcomes of numerous weather events, not solely those of floods. Further research conducted by Kuruppu et al. (2013), on small businesses in Australia, highlighted that high rates of failure were the consequences of damage to

critical ‘lifeline services’, such as water supply, energy, telecommunications, and transport. In such instances, many small businesses were prevented from trading for extended periods of time due to the delays incurred in the repair of critical infrastructure, leading to the loss of income and customers (Wedawatta, Ingirige, & Proverbs, 2013).

While some impacts of flooding are clearly noticeable, for example, property damage, building blockage, and loss of sources of raw materials, others may be unnoticed. For instance, flooding may cause data loss and hinder the subsequent recovery phase, lead to problems in purchasing orders, completing insurance claims, tracking orders, and filing tax returns (Pitt, 2008). Also, Whittle et al. (2010) reported that flooding could cause an indirect impact regarding ‘secondary flooding’, where the costs of damages may not be immediately obvious or may not be covered by insurance policies. Such instances include difficulty in securing financing and obtaining insurance coverage at a reasonable cost and being forced to pay a higher premium for the coverage (Metcaft & Jenkinson, 2005). Secondary flooding could be particularly challenging for SMEs as the hidden costs involved hinder the recovery efforts of such small businesses (Tierney, 2007; Whittle et al., 2010). However, in contrast, SMEs could also be faced with some positive effects in the form of new business opportunities. Webb, Tierney and Dahlhamer (2002) stated that disasters, such as flooding, could create windows of economic development as a result of reconstruction booms and allow rapid community improvement. For example, industrial sectors such as construction will benefit from the impacts of flooding due to the increased demand for reconstruction and the development of more robust structures (Dlugolecki, 2004).

Jonkman, Bočkarjova, Kok, and Bernardini (2008) classified the types of damage characterizing floods and showed a distinction between the direct and indirect damages, which occur inside and outside of the flooded area, respectively. Other differences are the substantial damages that can be priced, and the intangible damages for which no market prices exist. Table 4 (p. 7) shows a range of identified impacts of flooding, including those that are commonly observed. However, it has to be noted that the different impacts may not be suitable for all factors due to the disparities in the studied samples, terminologies used, and the contexts of the events (Jonkman et

al., 2008). The present research aims to investigate the impacts of flooding with regard to tangible and priced damages consequent to direct and indirect impacts.

*Table 4.* Different dimensions of flood damages

	<b>Tangible and priced</b>	<b>Intangible and unpriced</b>
<b>Direct</b>	<ul style="list-style-type: none"> <li>- Residences</li> <li>- Capital assets and inventory</li> <li>- Business interruption (inside the flooded area)</li> <li>- Vehicles</li> <li>- Agriculture land and cattle</li> <li>- Roads, utility and communication infrastructure</li> <li>- Evacuation and rescue operations</li> <li>- Reconstruction of flood defenses</li> <li>- Clean-up costs</li> </ul>	<ul style="list-style-type: none"> <li>- Fatalities</li> <li>- Injuries</li> <li>- Inconvenience and moral damages</li> <li>- Utilities and communication</li> <li>- Historical and cultural loss</li> <li>- Environmental losses</li> </ul>
<b>Indirect</b>	<ul style="list-style-type: none"> <li>- Damage for companies outside the flooded areas</li> <li>- Adjustments in production and consumption patterns outside the flooded areas</li> <li>- Temporary housing of evacuees</li> </ul>	<ul style="list-style-type: none"> <li>- Societal disruption</li> <li>- Psychological traumas</li> <li>- Undermined trust in public authorities</li> </ul>

Source: (Jonkman et al., 2008)

It is important to identify the whole range of impacts of flooding on business in order to estimate and realize its true costs. If the costs are underestimated, it can adversely affect the evaluation of flood protection measures, leading to limited solutions. (Wedawatta & Ingirige, 2012). For example, Joseph, Proverbs, Lamond, and Wassell (2011) identified that one of the reasons for the low level of opting for resilient reinstatement by business owners, who were at risk of flooding, was the lack of understanding of the true costs of the impacts of flooding. In addition, the impacts of



flooding events on SMEs, as discussed above, are generally determined in international countries. Few studies have attempted to explore flooding impacts in the context of Thai SMEs. Therefore, the objective of this study is to explore the impacts experienced by Thai SMEs due to floods.

#### *1.1.6 Conceptual Understanding of Resilience*

Disaster resilience is a concept that has gradually gained traction in both theory and practice in disaster risk reduction discourse. The key concepts of resilience, community resilience, and potential roles of SMEs, which are vital in understanding how SMEs improve resilience to flood risk, are outlined below.

The term ‘resilience’ has many interpretations and is widely derived from ecology systems within the context of ecology literature (Adger, 2000a; Gallopin, 2006; Holling, 1973). The International Strategy for Disaster Reduction (ISDR) defined resilience as the ability of a system, community or society to rebound, to resist and to change quickly to obtain an acceptable level of function and structure (UNISDR, 2002). In other words, the capability of the social system to organize itself, including the ability to increase its capacity for learning and adaptation. Similarly, the IPCC defined resilience as the ability of systems, namely, social, economic, and environmental systems, to reorganize, respond, and cope with a hazardous event in ways that maintain their function and structure (Allan & Michael, 2012). However, Paton (2007) argued that the definition of resilience should consider the adaptive capacity of the system when it could be untenable to return to its pre-conditions because of the changes following a hazard event. According to this present study, resilience is defined as the ability to prevent, adapt and recover from, and learn from the impacts of disasters (Hallet, 2013). This definition goes beyond the ISDR and IPCC definitions and emphasizes the importance of learning from the impacts of disasters to incorporate the lessons learned in future preparedness.

## 1.2 Statement of Problems

Climate change between 2010-2015 is said to have contributed to the increasing rates of vulnerability to natural disasters for people around the world (EPA, 2015). In Thailand, the most common natural disasters are associated with floods, due to the geographic and climatic characteristics of the country (Aslam, 2015). Although some annual flooding during the rainy season between mid-June and October (EPA, 2015) is not unusual, in 2011 Thailand experienced its worst flooding in 50 years. Ayutthaya province, located in the central part of the country, was the most severely affected by the flood (ADPC, 2014). While the effects of major disruptions from flooding, in general, can affect all businesses, SMEs are particularly vulnerable, as they constitute a significant proportion of the communities that are negatively impacted by these events (Ingirige & Wedawatta, 2011).

SMEs in Thailand have suffered considerably from flooding when compared with their larger counterparts (Aslam, 2015). SMEs are one of the leading economic groups that successfully contribute to the local communities and economies. They comprise up to 99% of Thailand's total business enterprises, and the number of small businesses continues to grow annually (ADRC, 2012). The Thai government is aware of the potential dangers from natural disasters, particularly flooding, and has launched many strategies and projects to help the industrial sector prepare, adapt, and respond to such events. Unfortunately, SMEs are often excluded from these initiatives (ADPC, 2014).

Organizational resilience is an area of research with a limited range of empirical data to draw upon, and even less research that focuses on SMEs (Sullivan-Taylor & Brianicki, 2011). Only a few studies have examined the adaptive capacities, existing coping strategies, and resilience of the SMEs in responding to the impacts of flood events (Ingirige & Wedawatta, 2011; McGuinness & Johnson, 2014). In the Thai context, no research regarding the resilience of SMEs to flood risk at Ayutthaya province was located. Further, the concept of organizational resilience is rare among Thai SMEs (Aslam, 2015). There seems to be an obvious gap between the increase in flood occurrences in Thailand and the strategies implemented in improving SME resilience to flood risk.

### 1.3 Research Question and Objectives

The present study focuses on SMEs in Ayutthaya province, Thailand, which was significantly affected by the 2011 flooding.

The specific question this study addresses is: *How resilient are Thai SMEs in Ayutthaya province to flood risk?*

In addressing the research question above, the study will focus on three main objectives:

1. To explore the impacts of flood events experienced by SMEs.
2. To identify the measures and actions implemented by the SMEs in order to improve resilience to flood risk.
3. To investigate the drivers that guide the SMEs in implementing measures and actions to cope with and adapt to flood risk.

An important purpose of the study is to provide recommendations for SMEs in enhancing their adaptations to prevent and limit adverse impacts of future flooding on their business activities.

### 1.4 Organisation of Structure Dissertation

The dissertation is presented in five chapters. Chapter one has provided a general overview of the study and established the need for conducting the research. It included definitions and descriptions for SMEs, climate change, flooding consequences, and resilience in the context of climate change. Chapter two provides a literature review relating to objectives 2 and 3 above, including an overview of organizational resilience and a conceptual framework. Chapter three presents the research methodology and where the study is positioned within its perspectives. Chapter four presents the study findings and the analysis of the exploratory questionnaire used as a survey. Finally, chapter five discusses the study findings, including the two semi-structured interviews and consequent cross-case analysis, the exploratory questionnaire, and the survey, in relation to the existing literature. The chapter concludes with limitations of the study and provides recommendations and directions for future research.

### **1.5 Summary**

Small businesses play a key role in the economy and employment at Ayutthaya as well as the whole of Thailand (ADPC, 2014). The impacts of flooding include direct and indirect impact impacts and can negatively affect SMEs who are more vulnerable, than larger business organizations, to such events (EPA, 2015). This chapter introduced the research and established background information, including the definition of SMEs, climate change, flooding and its consequences - particularly with regard to SMEs, and the conceptual understanding of organizational resilience. The focus of the research was discussed, and the research objectives were identified. The next chapter provides a comprehensive literature review on the area of research.

## CHAPTER 2 – LITERATURE REVIEW

### 2.1 Introduction

This literature review examines the main issues surrounding the vulnerability of SMEs and their ability to adapt and reduce flood risk by using available measures. Aspects of the literature review relating to objective one of the research (i.e. to explore the impacts of flood events experienced by small businesses), is discussed in chapter one. This chapter focuses on reviewing the literature pertaining to objectives 2 and 3. In order to reduce the risk of flooding, it is necessary for small businesses to implement a portfolio of structural and non-structural flood risk management measures (Dawson et al., 2011). An overview of organizational resilience will be examined, including a conceptual framework used in the present study.

### 2.2 Organisational Resilience

A resilient organization can reduce the risks from hazards by avoiding disaster, and accelerate the recovery process in the event of a disaster with effective organization, by applying the lessons learned from previous experiences (Hallet, 2013). Haigh (2010) presented the role of resilience in determining an organization's response to a hazardous event by exploring specific characteristics of resilience and how resilience is viewed in a built environment (as shown in Figure 3, p. 13). While the concept of resilience is complex and open to a variety of interpretations, there are questions about how resilience can be applied to a built environment. Haigh and Amaratunga (2010) suggested that a relationship between disaster risk, resilience, and the reconstructed environment could occur when sensitive buildings, places, and spaces are designed, developed, and managed. This means that the capacity the sensitive contexts has to resist, or change, to reduce its vulnerability to hazards, thereby enabling the systems to continue functioning, both economically and socially, when subjected to a hazardous event.

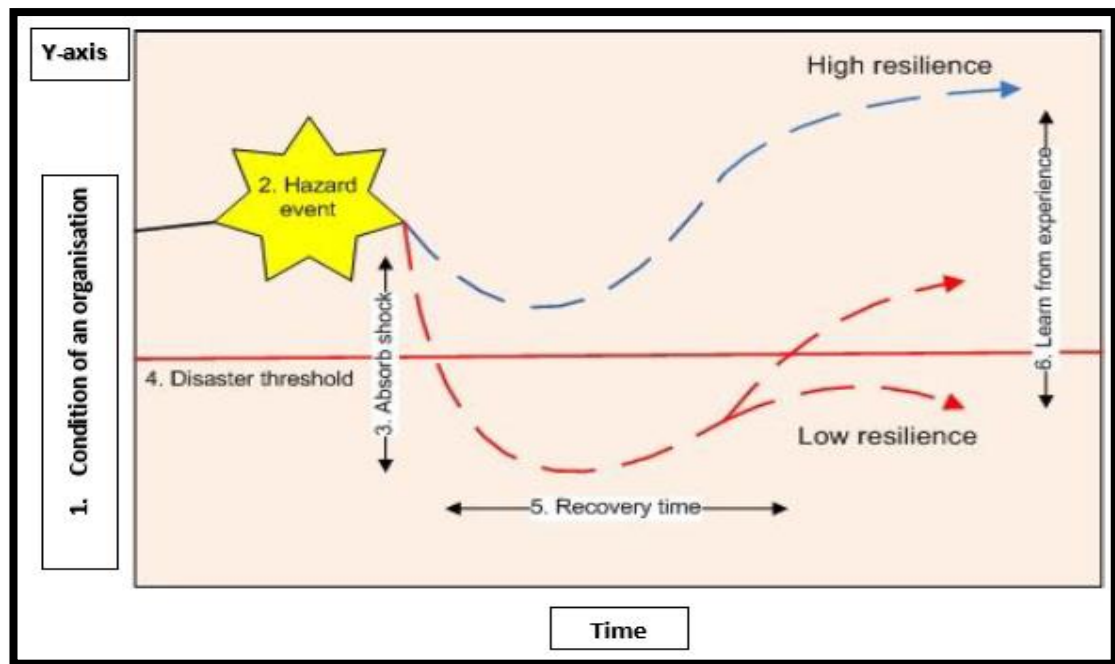


Figure 3. Role of resilience in determining organization response to a hazard event (adapted from Ingirige & Amaratunga, 2013)

The notion proposed by Haigh and Amaratunga (2010) can be explained by the numbered points in Figure 3. The Y-axis represents the conditions or states of disruptive events, such as natural hazards and manmade events. As illustrated in figure 4, by enhancing resilience, organizations can avoid or absorb the impacts of hazardous or dangerous events and reduce the magnitude of impact on the organization. A high resilient organization can cross the threshold and quickly recover from the hazards. This is because the organization is prepared and ready for disruptive events through planning, design, and efficient management of the built environment. In contrast, low resilience may result from an organization's inability to absorb and withstand the disruption, and the disregard for the lessons learned from prior experience (Ingirige & Amaratunga, 2013).

The discussion above suggests that the concept of resilience provides an understanding of how we can design, plan, and maintain a built environment that can manage uncertainties and challenges in a changing world.

### 2.3 Conceptual Framework for Resilience

This conceptual framework was adopted in assisting the researcher to identify the key criteria regarding vulnerability, coping capacity, and coping strategies to flood risk that contribute towards the level of resilience (Wedawatta, Ingirige, & Amaratunga, 2010). Such a framework will help answer the research question that allows SMEs to improve current understanding and awareness of resilience and vulnerability, which will, in turn, lead to enhancing their resilience against flood risk. As depicted in figure 4, organizational resilience is interconnected as a collective effect of vulnerability, coping strategies, and coping capacity. The following sections discuss each component in relation to the resilience of SMEs.

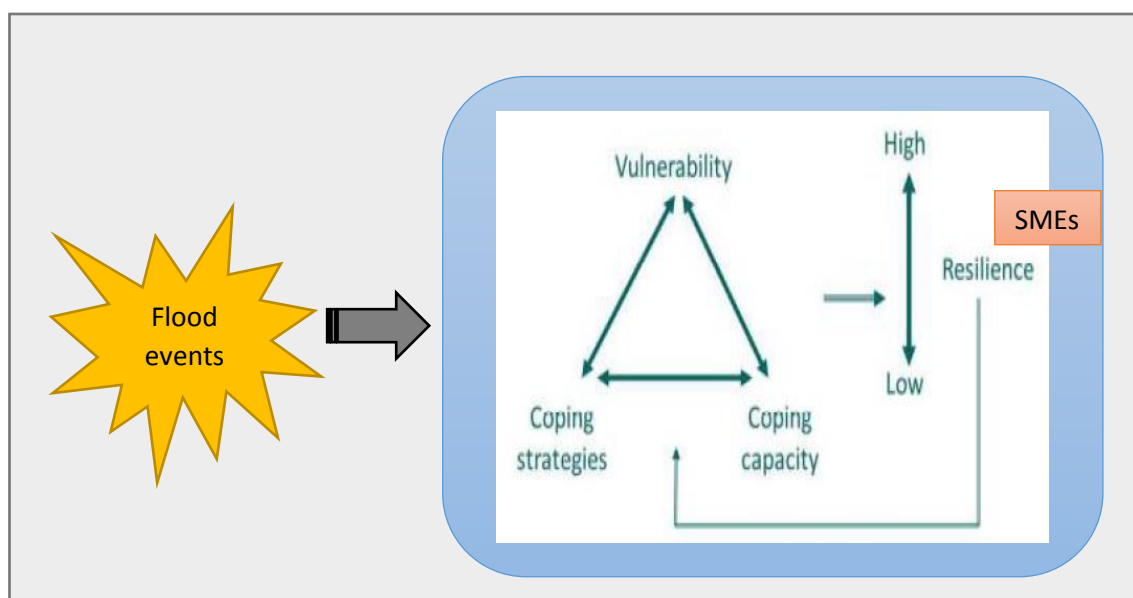


Figure 4. The conceptual framework of the study (adapted from Wedawatta et al., 2010)

#### 2.3.1 Vulnerability

There are various concepts of vulnerability used by researchers. In the context of climate change, the IPCC defined vulnerability as the level of system susceptibility, or the ability to cope with the impacts of climate change, such as climate variability and extremes (Parry, Canziani, Palutikof, Linden, & Hanson, 2007). Similarly, The United Nations Office for Disaster Risk Reduction (UNISDR, 2009) identified vulnerability as “the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard” (p.30). Both these

definitions address climate change and natural disasters, such as flooding, but are not specific to the context of SMEs. Therefore, Hallet (2013) and Wedawatta et al. (2010) identified a vulnerability in considering how susceptible SMEs are to the impacts of hazards. It is generally said that the level of impacts on SMEs can be harmed by a flood.

A number of factors influence the vulnerability of SMEs to a hazard. The business size is often linked with vulnerability, and small organizations are usually more vulnerable to hazards (Wedawatta & Ingirige, 2016). In contrast, larger businesses are likely to have access to more resources, which enables them to effectively identify and address the risks of hazards (Crichton, 2006; Kreibich, Müller, Thieken, & Merz, 2007; Wedawatta, Ingirige, & Proverbs, 2012). For example, Sullivan-Taylor and Branicki (2011) identified the impact organizational size has on resilience and reported that 'one-size-fits-all' type of advice or regulation is unlikely to benefit all businesses. The business size, therefore, acts as an influential factor, which contributes towards the vulnerability of a business to a hazard.

Most small businesses have been significantly affected by natural disasters due to various impacts, and SMEs are likely to fail soon after a disaster (Alesch, Holly, Mittler, & Nagy, 2001; Tierney, 2007; Wedawatta et al., 2012; Whittle et al., 2010). This is particularly dependent on the nature of the business as certain trades are more vulnerable to hazards. For example, Wedawatta and Ingridige (2016) identified that some SMEs in the construction sector, such as roofing work, groundwork, and wet trades - including brickwork, block work, and concrete work, were significantly impacted by natural disasters. This is due to the inability to carry out such activities under disruptive events. In contrast, Dlugolecki (2004) found that certain other specific industries, such as those involving flood defenses and the construction sector, could benefit following natural disasters due to the increased demand for reconstruction and repair of structures. Thus, the nature of business trades can be identified as a factor contributing to the vulnerability of SMEs.

In addition, certain businesses may be affected indirectly due to the vulnerability of the supply chain (Burnham, 2006b). Woodman (2008) considered ineffective supply chains, consequent to disruptions, to be one of the most significant negative impacts of disasters for business organizations. The vulnerability of supply chains includes



goods (e.g. material, components), services, disrupted lifelines (electricity, water supply, and sewage), and loss of transport and delivery services, all of which are identified as major influences of resilient organizations (Metcalf & Jenkinson, 2005). However, the report discussed by Metcalf and Jenkinson (2005) presented all sectors of businesses facing the impacts of climate change; therefore, its results might not be applicable to small businesses due to the different capability of supply chain management.

### *2.3.2 Coping Strategies*

The coping strategies adopted in this study are defined as the actions that improve an organization's ability to prevent, tolerate, and recover following the disruptions (Hallet, 2013). These actions may include both structural actions, such as property level protection measures, and non-structural actions, such as obtaining property insurance, business continuity planning, and flood defenses. Dawson et al. (2011) asserted that the combined use of both structural and non-structural actions provided a greater contribution towards minimizing flood risk in all scenarios. They further claimed that using currently available measures and tools are likely to be of greater importance for society in adapting effectively to, and reducing, flood risk. The previous chapter discussed how flooding can affect SMEs both negatively and positively. This section seeks to identify and evaluate various coping strategies that can be used to assist SMEs to counter the negative impacts of flood events in order to prevent and withhold the adverse impacts on their businesses.

#### *2.3.2.1 Business continuity/ risk management measures*

McManus and Carr (2001) identified a business continuity as an umbrella term which includes disaster recovery plan and risk management. Business Continuity Planning (BCP) not only facilitates "series of procedures to restore normal operations following a disaster but also influences societal. In general, an SME or a business can adapt to flood risk by using business continuity/risk management strategies. In addition to the general measures that are in place, such as property and business interruption insurance, business continuity planning (BCP), and home or flexible working, specific measures for dealing with flood risk can be implemented, including formulating a flood plan, signing up for flood warning systems, and carrying out flood

risk assessment (Wedawatta et al., 2012). Crichton (2006) noted that most businesses in the UK tend to implement various generic coping strategies (e.g. flood warning, insurance, and BCP) that contribute to business continuity, rather than devising detailed property-level protection measures against flooding. For example, while 51% and 50% of small businesses in the UK took actions regarding review business interruption insurance and home working or flexible working respectively, only 43% had reviewed property improvements. Although the findings reported by Crichton are considered in the context of the effects of climate change on SMEs, this report was clearly manifested in the impacts of flooding, and the supporting evidence is related to the present of this study. Similarly, Ingirige and Wedawatta (2011) suggested that SMEs are likely to rely on general business continuity/risk management strategies, with a minimal implementation of property-level protection measures. Generally, SMEs that have experienced flood-related hazards were more likely to implement property-level protection measures than those without such experiences (Wedawatta & Ingirige, 2012).

Generic business continuity strategies such as BCP, including business interruption insurance and property insurance, are common practices on policy frameworks in European countries (ADPC, 2014). However, in developing countries like Thailand, such measures are not considered as important. BCP is likely to be a new concept compared to risk management planning practiced by the national and local governments in Thailand. Implementation of BCP is particularly rare among Thai SMEs, which constitute more than 90% of the private sector (ADPC, 2014). To this end, following the 2011 flooding in Thailand, the Asia-Pacific Economic Cooperation (APEC) promoted the use of BCP to better prepare businesses and communities for natural disasters. Similarly, the Asian Disaster Reduction Centre's (ADRC) survey showed that only 13% of SMEs of the private sector within the APEC region have BCP and that both large and small businesses that have experienced a disaster were more aware of the BCP than those that have not (ADRC, 2012).

In addition to BCP, property insurance and interruption insurance were the business continuity measures most commonly implemented by SMEs (Ingirige & Wedawatta, 2011). Insurance is one of the main coping strategies used by businesses to manage the financial consequences of risk, including those following floods, earthquakes, and windstorms (Willis International, 2012). Given that relief measures and assistance

offered during such disasters are understandably prioritized to domestic households over SMEs, they are predominantly reliant on insurance for assistance (Crichton, 2006). However, most SMEs in Thailand had no insurance cover due to numerous reasons. For example, 75% of SMEs in Thailand were underinsured or not insured at all because they did not see the risk of flooding as a real threat to their businesses (ADPC, 2014). Thurston et al. (2008) highlighted that SMEs are deterred from obtaining insurance cover because they feel it is too expensive. In addition, the insurers are currently unable to offer insurance packages that motivate the property owners to do so. It is evident that obtaining property insurance and business interruption insurance is a standard practice in most developed countries. In developing countries such as Thailand, particularly for Thai SMEs, limited access to financial aid remains an important policy challenge (Panyasavatsut, 2011). Although Thailand has created “The Catastrophe Policy” insurance, which provides cover in the case of three natural disasters: flood, earthquake, and windstorm, the exceedingly high premiums and excesses entailed impose a limitation (Willis International, 2012). Therefore, other financial sources such as government cash compensation, loans from banks or business networks, and family financial sources, play a vital role as alternative sources of assistance for most small businesses in order to accelerate the recovery process and ensure the survival of their businesses (Asia Development Bank, 2012).

The above facts suggest that generic strategies for business continuity can only limit the impacts of floods on businesses and help the recovery process, rather than prevent damage to property. Therefore, mechanisms such as property-level protection are required in protecting its contents if a business is located in a flood prone area.

#### *2.3.2.2 Property-level flood protection*

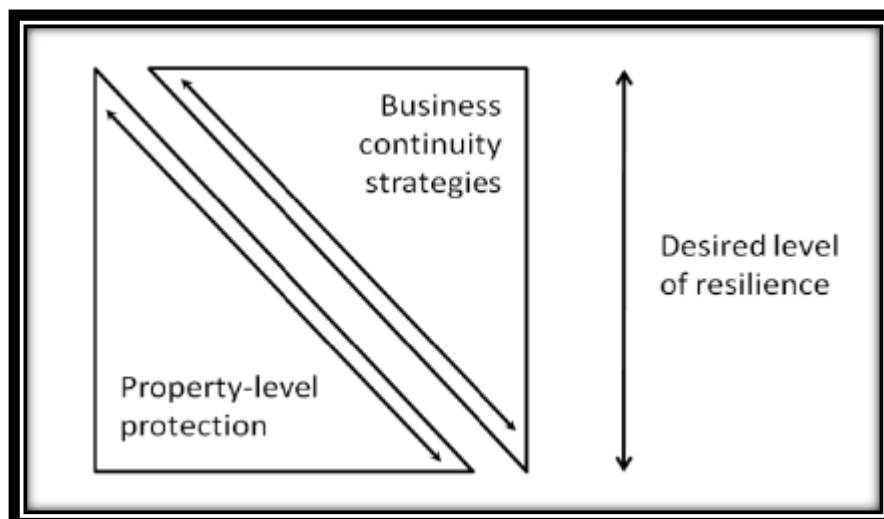
Generally, maintaining dams and dikes are both necessary and effective against ordinary floods, which are relatively frequent. However, they are of limited use in preventing cases of extreme floods that occur less frequently (Wedawatta & Ingirige, 2012). Property-level flood protection measures can be identified as the efforts taken in implementing effective means of managing the flood risk to existing buildings (Jukkrakorn, Sachdev, & Panya, 2014). These can be categorised into two groups: 1) Flood resistance measures, which are barriers against floodwater entering properties; and 2) Flood resilient measures, such as replacing carpets with waterproof tiles and

raising electricity sockets, which reduce the impact of the floodwater that enters the property, in addition to aiding the recovery process (Environment Agency, 2012). However, despite the presence of flood protection measures, including drainage and irrigation infrastructure and floodwalls, it is impossible and impractical to reduce all flood risks; some properties will still be exposed to the risk of flooding (Wedawatta & Ingirige, 2012).

Although businesses can protect themselves, to a certain extent, by opting for generic business continuity strategies, as discussed above, these will not prevent their properties from being flooded. Beddoes and Booth (2012) recognized that the implementation of property-level flood protection measures does not only reduce internal property damage, providing its associated obvious financial benefits but also reduces the social disruption caused by minimizing the duration of the repair and restatement time, both of which are greatly beneficial to property owners. It clearly decreases the length of time within which the owners can return to their properties to resume their normal activities after a flood. Therefore, property-level flood protection is considered to be a prominent feature, which has to be incorporated in the business' response to flood risk (Wedawatta & Ingirige, 2012).

A case study on flood-affected companies in Germany revealed that stock and equipment relocation to upper floors of buildings, flood-proofed tanks and air-conditioning, adapted building structure, and water barriers were the most common property-level flood protection measures implemented by businesses (Kreibich et al., 2008). However, the project surveyed by Kreibich et al. (2008) was conducted in random samples of general companies including private and government companies and, therefore, its results might not be applicable to SMEs. Other studies have reported that small businesses implemented low levels of property-level protection measures, with the common flood resistance measure being the availability of sandbags (Crichton, 2006; Ingirige & Wedawatta, 2011).

The above discussion shows the importance of coping strategies. SMEs can implement a mix of property-level protection measures and generic business continuity/risk management strategies (see Figure 5, p. 20) in order to effectively manage the risk of flooding and its consequences (Wedawatta & Ingrigie, 2012). It is important for businesses, in particularly for SMEs, which are by definition constrained by resources, to establish priorities and invest resources in planning for disasters such as flooding (Frost, 1994). Therefore, appropriate coping strategies adopted by SMEs could contribute towards their long-term resilience to disasters and make them less vulnerable. Further, in order to increase organizational resilience, adaptive capacity is considered to be the ability of an organization to implement effective coping strategies.



*Figure 5.* Achieving a balance between property-level protection and business continuity strategies (Wedawatta & Ingrigie, 2012)

### 2.3.3 Coping Capacity

The UNISDR (2009) referred to coping capacity as the ability of people, systems, and organizations, utilizing their skills and resources to cope with adverse conditions, emergencies, and disasters. In the present study, coping capacity is defined as the ability of people and organizations to limit the impacts of hazards, utilizing their skills and resources (Hallet, 2013). In the context of SMEs, this can be defined as the ability of SMEs to limit the impacts of flood risk, utilizing their skills and resources. Therefore, the concept of coping capacity is in line with the definition of resilience,

and similar to the definition of coping capacity given by the UNISRD, which highlights the ability to manage resources that are available, in this instance, to SMEs. However, despite the overall similarities in the definitions, Gallopín (2006) pointed out that coping capacity refers to a short-term capacity or the ability to survive, whereas adaptive capacity encompasses long-term adjustments. Given that the present study focuses on the nature of flood risk that may occur in the immediate future, and the associated short-term strategies of SMEs, the term coping capacity will be used.

Linnenlueke and Griffiths (2010) noted that achieving organizational resilience requires developing multiple capabilities and response approaches. There are several key elements affecting the coping capacity of SMEs to hazards. As pointed out by Wedawatta and Ingirige (2016), previous disaster experience is the most important criterion that determines the coping capabilities of SMEs. The present study focuses on a construction SME and the impacts of extreme weather events, and this confirmed that construction SMEs also tend to implement organizational coping strategies and address the risk of extreme weather events only after being affected. Similarly, Thurston et al. (2008) concluded that SMEs that have been affected were much more eager to take up property-level protection strategies than business continuity strategies. For example, 22% of non-flood affected SMEs had carried out improvements to their business properties, compared with 50% of flood-affected SMEs (Thurston et al., 2008). Ingirige and Wedawatta (2011) also discovered that SMEs with non-flood experiences were more likely to depend on generic business strategies rather than property flood protection measures. However, Berkhout, Hertin, and Arnell (2004) argued that small businesses find it difficult to assess the advantages and disadvantages of alternative adaptation strategies unless they have been previously affected by flood experience.

The experience and perception of the owners or senior management are also a crucial driver, which contributes to the decision-making process related to disruptive events. Norrington and Underwood (2008) identified the perspectives of the owners of SMEs or senior management to play a key role in driving the coping capacity related to disruptive events. For example, Wedawatta and Ingirige (2016) reported that while positive perceptions of senior management to the risk of extreme weather events within their organization have contributed to enhancing their resilience strategy, the

denial of the management about the risks led to the failure of such implementation. In addition, perceptions are also identified as one of the reasons given by the SMEs for not adopting property-level measures. For example, they believe it would be expensive; the property is adequately protected by community level protection measures; and SMEs cannot decide for themselves what measures to implement (Thurston et al., 2008). Further, established relationships with clients have helped businesses to withstand the adverse impacts and recovery following disruptions; for example, due to the ability to negotiate better and in sourcing help from contractors or networks (Wedawatta & Ingirige, 2016).

## **2.4 Summary**

This literature review provides compelling evidence of the level of organizational resilience that an SME can achieve against the impacts of hazards, such as flood risk, depends on the vulnerability, coping strategies adopted, and the inherent coping capacity of the organization. Vulnerability, in the context of SME, is defined as the circumstances of SMEs that determine how susceptible they are to flood risk (UNISDR, 2009). Many factors can be identified as key in influencing the vulnerability of SMEs, including the size of business, nature of trades and supply chains. Therefore, improving an organization's ability to prevent, withstand, and recover from flooding risk requires implementing coping strategies, both physical and non-physical, such as business continuity, property insurance, and property level protection measures. Further, coping capacity in an organization is a crucial component in improving organizational resilience, with regard to having an awareness of the need to adapt, and in making the necessary decisions to advance the process of adaptation.

Academic research that addresses the issues of the resilience of SMEs in Thailand to flood risk is limited. Comprehensive studies focusing on these aspects including the impacts, perceptions, their drivers/barriers, and support requirements are needed. Therefore, the enhanced conceptual framework adopted in the present study will serve to identify the resilience of SMEs.

## CHAPTER 3 – RESEARCH METHODOLOGY

### 3.1 Introduction

This chapter discusses the research methodology used in the present study. It adapts the “research onion” model, proposed by Saunders, Lewis, and Thornhill (2009), which illustrates the numerous aspects that have to be considered in designing a research study, including determining the research philosophy, approach, strategy, choice, and techniques that are applied. These aspects are detailed in this chapter followed by a discussion of data analysis, validity and reliability, and ethical considerations.

### 3.1 Research Methodology and Design

Methodology is the overall approach adopted to investigate a problem, which is used in a research study, from the theoretical foundation through to the collection and analysis of the data (Remenyi, Williams, Money, & Swartz, 2003). Saunders et al., (2009) equated the overall research methodology to the structure of an “onion”, where the outermost layer comprises research philosophy, and the thoughts on the research problem lie towards the center of the onion. Therefore, to reach the center, in order to answer a research question, the researchers have to peel several outer layers, one by one (see Figure 6). This section describes the research methodology in following the consecutive layers of the research onion.

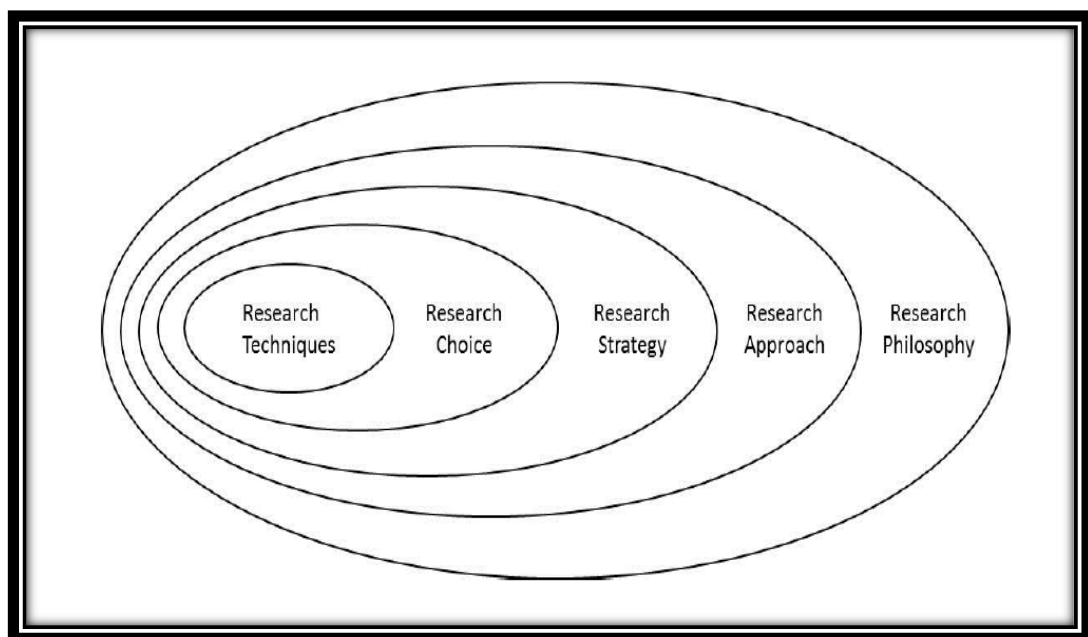


Figure 6. The research onion (Adapted from Saunders et al., 2009)



### 3.2 Research Philosophy

The research philosophy stage relates to the assumptions made about how a particular researcher views the world. These assumptions act as a base for the research strategy and the method that the researcher chooses to use (Saunders et al., 2009). Easterby-Smith, Thorpe, and Jackson (2008) asserted that understanding the research philosophy enhances the researcher's ability to select the appropriate approach and research design, and allows him/her to create a selection or adaptation of methods. Saunders et al. (2009) identified three main ways of viewing research philosophy: epistemology, ontology, and axiology. The present study will focus on the epistemology component.

Epistemology addresses what acceptable knowledge is. It refers to the relationship between the researcher and what is being researched (Saunders et al., 2009). Collis and Hussey (2009) and Saunders et al. (2009) identified the two ends of epistemology to be positivism and interpretivism. Burns and Grove (1999) stated positivism would probably adopt the philosophical stance of the natural scientist. In contrast, interpretivism is an epistemology that emphasizes the necessity for the researcher to understand the essential nature of people's participation socially and culturally, and to figure out their behaviors as social actors. It also highlights the importance of identifying the differences of conducting research using people rather than objects (Saunders et al., 2009).

According to Saunders et al. (2009), identified pragmatism takes place when a view lies in between the two ends of epistemology, where the research question determines the epistemology instance. This present study seeks to explain how SMEs can improve their resilience to flood risks. Depending on the nature of this research question, it can be identified that it occupies a mid-stance on the epistemology of pragmatism, as this research involves SMEs that are managed by owner managers in a more personal way than larger business organizations (Analoui & Karami, 2003). The pragmatic paradigm benefits the researcher who has chosen methods that are appropriate and uses the findings in a positive manner (Tashaakkori & Teddlie, 1998). Creswell (2003) asserted that the pragmatic paradigm could employ the mixed qualitative and quantitative approach for social and management research endeavors. However,

Morgan (2014) argued that adopting the pragmatic paradigm could cause the researcher to place much effort into integrating different methods instead of conducting solid research. Further, Saunders, Lewis, and Thornhill (2015) asserted that an interpretivism perspective is highly appropriate in the case of business and management research, particularly in organizational behavior. Therefore, it can be said that the epistemological positioning of this research is inclined more towards interpretivism than towards positivism. Also, Cranford (2016) noted that positivist sociology focuses more on one fact that may not always be correct. In other words, the advantage of interpretivism is to understand the meaning behind actions in a social context through the consideration of a subject's unique point of view. As a result, interpretivism can take a whole new meaning from the perspectives of different individuals.

### **3.3 Research Approach**

Saunders et al. (2009) noted that the extent to which the researcher is informed about the theory at the beginning raises an important question about the design of research and which research method will be employed. They identified two different approaches: deductive (testing theory) and inductive (building theory). The deductive approach involves the development of a theory that the researcher theorizes, and hypothesizes, and accordingly designs a research strategy to test the hypothesis. The inductive approach enables the researcher to collect data and develop a theory deduced by analyzing the collected data (Collis and Hussey, 2009).

In the present study, both the deductive and the inductive approaches are employed. Saunders et al. (2009) noted that it is advantageous to combine both deductive and inductive approaches in the same research due to the rigid divisions that exist between these two methods. For example, Creswell (2003) emphasized that employing a mixed approach helps the researcher to better understand the research problem due to the rich sources of information. This study seeks to understand how they can improve their resilience to flood risks. It, therefore, aims to understand the individual responses of SMEs to flood risk. These aspects point out that the research uses the inductive approach. Curran and Blackburn (2001) also stated that, in practice, a small business study follows a variant of the inductive approach rather than the deductive approach.

### 3.4 Research Strategy

The research strategy refers to the overall direction of the research including the process by which the research is conducted (Remenyi et al., 2003). Yin (2003b) stated that although different research strategies exist, there are overlaps between them. Therefore, it is important to consider the most advantageous strategy for a particular research study. Research strategies commonly used in business and management are an experiment, case study, action research, grounded theory, ethnography, and archival research (Collis & Hussey, 2009; Easterby-Smith et al., 2008; Saunders et al., 2007). Of these, the case study research was employed as the most suited strategy for the present research.

#### 3.4.1 Case Study

Yin (2003b) defined case study research as an in-depth understanding of a single or a small number of cases to investigate a contemporary phenomenon within a real-life context, especially when the boundaries are not clearly evident between phenomenon and context, and in which multiple sources of evidence are used to guide data collection and analysis. Therefore, case study research can accommodate different research techniques and can be used to explore in-depth knowledge about a particular phenomenon (Yin, 2003b).

#### 3.4.2 Reasons for Selecting Case Study Strategy

Although critics of case study research strategy highlight the limitations of establishing reliability or generality of the findings, due to a single or a small number of cases, researchers with careful planning in studying real-life phenomena have successfully adopted it (Soy, 1997). The case study strategy was selected as applicable for the present due to a number of reasons.

Firstly, a case study is a suitable research strategy that is applicable to certain situations. Yin (2003b) recommended a case study approach when three conditions, are present: when the research questions take the form of “how” and “why”; when the proposed research focuses on a contemporary phenomenon. Given that, the research question considered in this study is: “*How resilient are Thai SMEs in Ayutthaya province to flood risk?*”, and involves a “how” type of research question, case study research strategy is likely to be applicable. Also, the issue being investigated is contemporary as its focuses on how the SMEs are affected, and how they respond and

adapt to flood risks, currently. Further, the researcher does not have control over the behavior of SMEs or the flood risk that affects them. Therefore, the researcher has the role of an observer, outside of the “case” that is being researched.

Secondly, a case study has the capacity of accommodating both quantitative and qualitative data, allowing the researcher to obtain a rich mix of data for the given study (Yin, 2003b). The objectives and the research question investigated in this study were best met using a combination of research techniques for data collection and analysis. For example, the objective related to identifying adaptation measures employed by SMEs favored a questionnaire survey approach to explore a range of adaptation strategies; whereas the aim of assessing the current adaptation measures of SMEs, favored a method that investigates through in-depth analysis with the use of a semi-structured interview technique. Therefore, the ability to accommodate different research techniques is deemed suitable for case study research (Yin, 2003b).

#### *3.4.3 Single or Multiple Cases*

Case studies can be based on single or multiple cases (Yin, 2003a). A single case provides an opportunity to observe a significant phenomenon that few have considered before (Eisenhardt & Graebner, 2007). Yin (2003b) identified that a single case study is to observe a phenomenon that is critical, extreme, or unique; whereas multiple case studies involve more than one study. Collective evidence from many studies suggests multiple case studies be preferable over a single case and to be more robust in terms of the results (Remenyi et al., 2003). Yin (2003b) asserted the preference for multiple case studies to their capacity to expand generalization and the possibility of replication.

SMEs are a markedly heterogeneous group of businesses, representing numerous industries (Lucas, 2005). For example, the differences between the owner-managed small businesses (10-20 employees) and the medium businesses (50-200 employees) could be related to the different levels of skills, capital, and sophistication (OECD, 2004). Therefore, a multiple case study design was developed for the present study with the intention of encompassing the numerous business situations.

### **3.5 Research Choice**

Research choice refers to the way in which qualitative and quantitative techniques and procedures are chosen to be combined in a research study. As discussed in Section 3.4,

both qualitative and quantitative data collection techniques can be combined to suit a particular research in answering the research question raised. Saunders et al. (2009) identified two main branches of research choice. The mono method uses single data collection techniques and corresponding analysis procedures whereas the multiple methods use many data collection techniques and analysis procedures to answer the research question. Mixed methods are the general term used when both qualitative and quantitative collection techniques and procedures are applied in research design (Saunders et al., 2009).

The present research adopted a mixed method approach. Robson (2011) identified that mixed method research design is compatible with the pragmatic philosophical view (as discussed above). Tashakkori and Teddlie (2003) asserted that mixed methods enable triangulation to take place. For example, a questionnaire is used to collect exploratory data, and semi-structured interviews can be a valuable way of triangulating the data gathered by other techniques such as a questionnaire. Further, Curran and Blackburn (2001) noted the mixed method approach as a general method for small business research, and as a useful approach to answering the research question incorporating beneficial contributions from triangulation and characteristics inherent to both quantitative and qualitative approaches.

### **3.6 Research Techniques**

For the present study, the mixed method was selected, in conjunction with both qualitative and quantitative data collection and analysis techniques. Figure 7 (p. 29) shows the overall research process of this study and the different data collection technique used, which will be discussed in detail in the following sections.

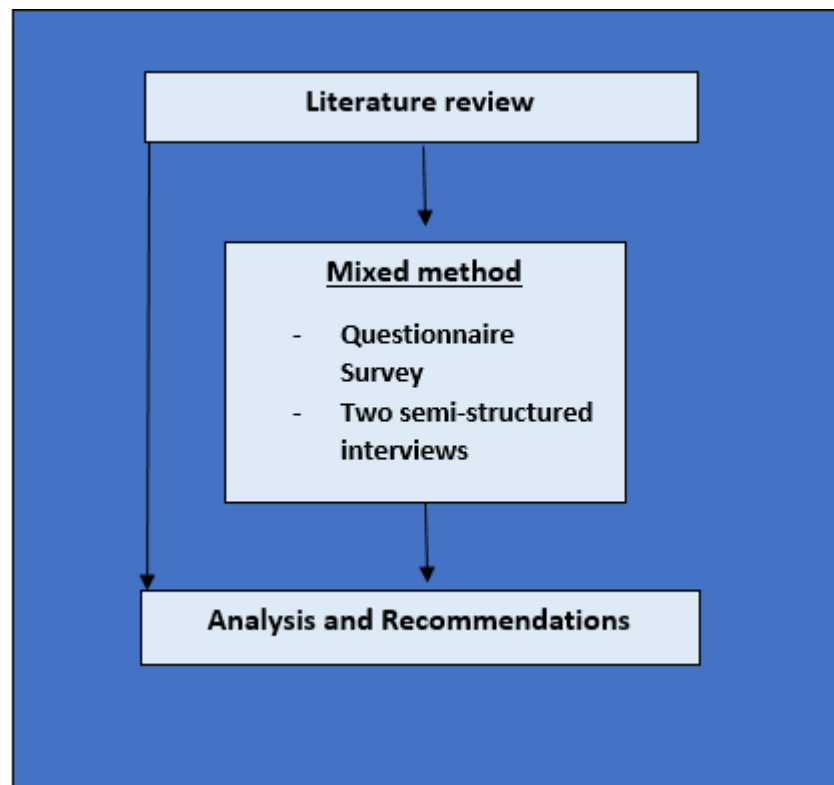


Figure 7. Research methods used in this study

### 3.6.1 Data Collection

Evidence for a case study, according to Yin (2003b), can be collected through six main techniques: interviews; direct observation; documents; archival records participant-observation and physical artifacts. Yin (2003b) also noted that a case study could either select a single source of evidence or encompass various quantitative data collection techniques.

#### 3.6.1.1 Questionnaire survey

The questionnaire survey technique was employed in this research to explore the initial scope of the problem. This is the preliminary stage of the research and allows gaining a better understanding of the common issues affecting the SMEs with regard to flood risk, and for investigating the current adaptation measures adopted by them against flooding. Further, the results obtained from the questionnaire survey guided the interview stage with regard to factors such as focus, direction, and the content of the semi-structured interview. Also, the key aspects identified by the survey were addressed in detail; for example, given that the sample studied involved SMEs from different industry sectors, it enabled comparison of practices of the different sectors.

Adolphus (2013) revealed that the questionnaire survey complemented the subsequent main case study research, in addition to raising a new research question, which was addressed at the case study research stage. However, there are limitations of questionnaire surveys. For example, a high response rate secured from the survey can be difficult to manage, and the data produced are likely to lack sufficient detail or depth on the topic; on the other hand, small sample sizes will not yield accurate results (Kelley, Clark, Brown, & Sitzia, 2003)

#### *3.6.1.2 Questionnaire survey template design*

The survey questionnaire template was adapted from the CREW research project by Wedawatta and Ingririge (2012), which aimed to study the resilience of SMEs to the effect of extreme weather events, as a part of a multi-disciplinary research project involving 14 UK universities. The questionnaire contained three main sections: general information, experience to flood risk, and preparedness to flood risk, with space to include any specific issues/comments from respondents (see Appendix A).

#### *3.6.1.3 Survey distribution*

A self-selective, non-probability sampling technique was employed to arrive at the sample for the questionnaire survey. Self-selective sampling occurs when the researcher allows respondents to identify their desire to take part in the research, such as the following advertising through appropriate media or asking respondents to participate (Saunders et al., 2009). Further, Saunders et al. (2009) noted that a self-selective technique is the most practical when the research conducted is exploratory. In the first stage of research, the questionnaire survey was conducted as an exploratory survey to undertake an in-depth study of the case study interviews. Therefore, the sampling technique selected is appropriate for the research requirements.

Accordingly, a door-to-door survey was conducted among the SMEs located in five of the 16 districts in Ayutthaya Province, namely: Phra Nakhon Sri Ayutthaya, Ban-Sai, Bang-Barn, Bang Pa-Inn, and Sena. The Provincial Administration Organisation (PAO), Sub-district Administration Organisation (SAO), SME Bank and the SME Organisation recommended the SMEs involved in the survey. The target respondents were members of the senior management such as, managing directors, owners, sole proprietors, partners, and directors, because they were responsible for making higher-level operational decisions within their organizations. The questionnaire survey

received 10 completed responses from different SME sectors in Ayutthaya Province. The questionnaire responses were then analyzed and compared with current literature, as well as the findings of the questionnaire survey, which determined the design of the data collection techniques of the case study interviews.

#### *3.6.1.4 Study area*

Ayutthaya Province in Thailand was selected as the study site. It is an area of 14.84 km<sup>2</sup> located approximately 70 km north of Bangkok with a population of over 680,000. Ayutthaya Province was established in 1350 AD as a capital city in the ancient era and was inscribed on UNESCO's World Heritage List. Due to historical significance, Ayutthaya Province has become a focus for both the tourist industry and residential development. Therefore, it represents a crucial historic preservation area, a commercial area, and a residential and agricultural area (Vojinovic et al., 2015).

Ayutthaya is particularly vulnerable to flood risk due to a significant proportion of the city being located at the confluence of three rivers: the Chao Phraya River, the Lopburi River, and the PaSak River (See figure 8, p. 32). The area for the province is susceptible to fluvial flooding generated in the upstream catchment, as well as pluvial flooding that can result from intense rainfall (Raungratanaamporn & Hidehiko, 2014). As a result, Ayutthaya is located in a flood-prone area, which is impacted by annual floods, especially during the rainy season (May-October). The province has been afflicted by flooding five times during 2005 to 2012. The devastating flood in 2011 was the worst event in this province, as the entire province was inundated for over a month, and floodwaters exceeded four meters in depth in some areas (Vojinovic et al., 2015). Therefore, enterprises in Ayutthaya were adversely affected, particularly due to the massive loss of business, the cost of disaster mitigation, and the outlay of the damage to/loss of buildings (Aslam, 2015).



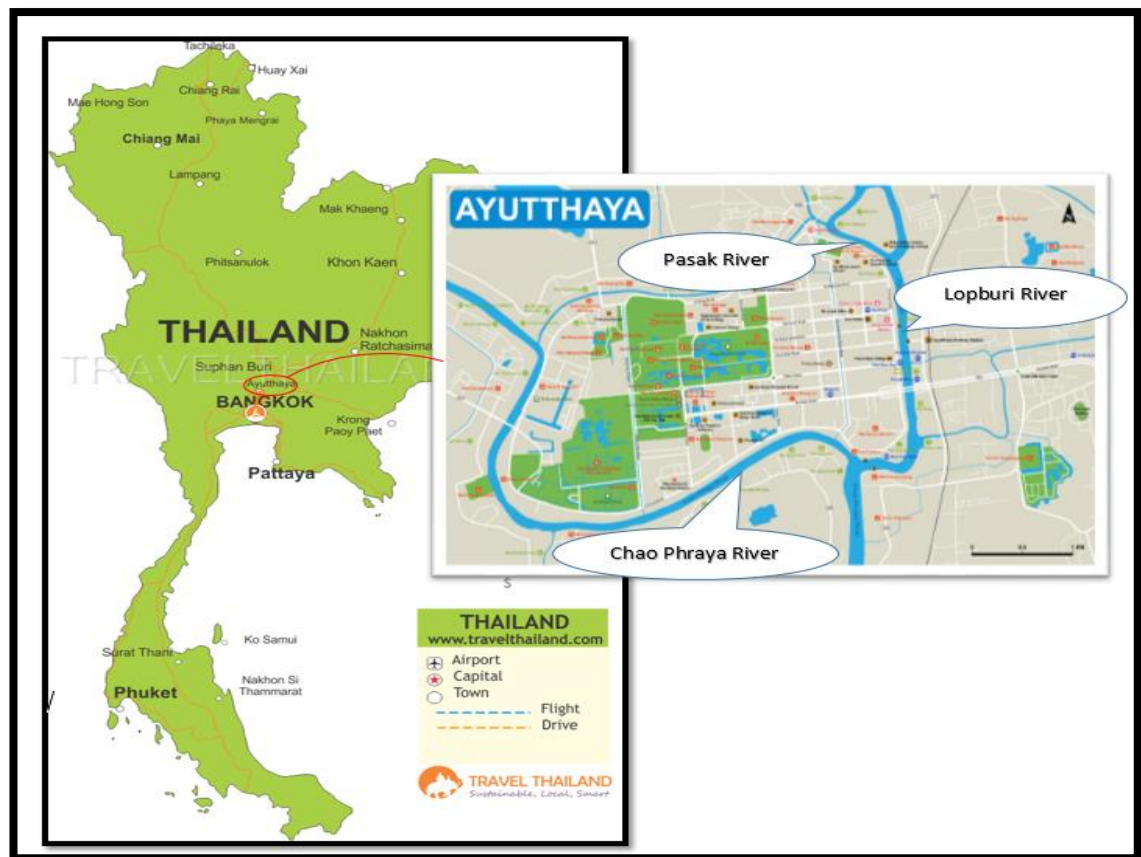


Figure 8. Map of the study site (Travel Thailand, n.d.)

### 3.6.1.5 Semi-structured interview

Semi-structured interviews are a technique in which the researcher has a prepared list of themes and questions that need to be addressed. This approach may vary from interview to interview, where the researcher may omit some questions in particular interviews and focuses on a specific organizational context associated with the research topic (Saunders et al., 2009). Bryman (2008) and Cassell (2009) noted semi-structured interviews to be probably the most utilized qualitative research method. Yin (2003b) asserted that this approach is one of the most important sources in a case study where it is based on a small and unrepresentative number of cases. For the present research, semi-structured interviews were employed as the main case study data collection technique. Saunders et al. (2009) identified that semi-structured interviews is preferred in a case study strategy because they can be used to gather data, which both contributes to revealing and understanding the ‘what’ and the ‘how’, and places more emphasis on exploring the ‘why’ (Saunders et al., 2009). Therefore, semi-structured interviews provided a way to collect specific information from different SMEs.

#### *3.6.1.6 Selection of semi-structured interviewed cases*

The purposive sampling technique was used for selecting SMEs as case studies. This technique allows the researchers to use their judgment in choosing cases that best enable answering the research question at hand and to meet the research objectives. Purposive sampling is often applied when using small samples, such as in case study research, and when the researcher wishes to adopt cases that are specifically informative (Neuman, 2005). Yin (2011) identified that purposive sampling was preferred in qualitative research where samples are employed in a deliberate manner. Yin further reiterated that the reason for adopting a purposive sampling technique was to select the cases that were most relevant and information-rich.

The participants for this study were selected based on them being permanent residents in Ayutthaya province, with or without having experience of being affected by flooding in the study area. SMEs, as classified by the Thai Ministry of Industry for SME businesses, served as a guideline. It was essential to ensure that the participants were available at the time of the study to meet and, most importantly, have the capacity to consent freely. Survey respondents were mostly the senior management of businesses (managing directors, owners, sole proprietors, partners, and directors) who are responsible for decision-making in their businesses. Accordingly, two case studies were developed to investigate whether the risk of flooding has been considered within their organizational decision-making process and whether the risk has been addressed by some measures that are in place in property-level protection and BCP. The first case study involved a shop retailing drinking water, and the second focused on the construction of a retail shop. Both SMEs are small businesses employing 6 to 10 employees and are established organizations that have been in business for four and six years (see Table 5, p. 34 for SME profiles). Further details about the case study SMEs are provided in the results chapter.

Table 5. Profiles of the SMEs studied

SME	Number of employees	Flood experience	Respondent	Age of business	Property of ownership	Main business activity
1	10	First directly affected	Owner	4	Lease	Produced a water drinking shop
2	15	First directly affected	Owner	6	Own	Retail construction shop

### 3.6.2 Data Analysis

After considering the available research options, a questionnaire survey and semi-structured interviews were used for this study for collecting data to be analyzed, quantitatively and qualitatively. These data collection techniques are explained below.

#### 3.6.2.1 Quantitative data analysis

Exploratory data analysis is the approach used at the initial stage of the research. Turkey (1977) identified that exploratory data analysis is an approach to emphasize the use of diagrams to explore and understand data. Saunders et al. (2009) noted that exploratory data analysis allows the researcher's flexibility to introduce previously unplanned analyses to respond to new findings. This technique is initiated by studying the individual variables and their components to answer the research questions at hand, and the objectives including specific values, highest and lowest values, and trends over time, proportions, and distributions (Sparrow, 1989).

#### 3.6.2.2 Qualitative descriptive approach

This study used the qualitative descriptive approach to obtain data from the interviews by using open-ended questions. The aim is to describe the informant's perception and experience of the world, and its phenomena. This enables the data to be closely representative of the rich and direct description of an experience shared by a participant (Neergaard, Olesen, Andersen, & Sondergaard, 2009). The qualitative descriptive approach is often criticized for its limitations regarding analysis when data is neither generated nor interpreted using existing theories. However, descriptive summaries may produce working hypotheses or main categories for future theory-based research (Sandelowski, 2000). Neergaard et al. (2009) identified that using this approach fits a mixed method since it is appropriate for intervention development and

conceptual clarification in vulnerable populations. This appears to be the most relevant approach for the present research, as it allows gaining first-hand insight into the informant's views of a particular topic. Since the research tool was in the Thai language, the data were translated to English before analysis.

### 3.6.2.3 *Cognitive map*

A cognitive map is a technique used to analyze and identify new concepts emerging from interview data, and demonstrate the relationships that exist between different issues. Ackermann, Eden, and Cropper (2004) noted that cognitive maps are also used to structure, analyze and describe problems, which emerge from interviews. Therefore, the technique provides valuable analysis of the subjective views of the interviewees (Eden, 1992). Morgan, Fischhoff, Bostrom, and Atman (2001) concluded that cognitive maps allow individuals and organizations to develop clear and understandable messages about risks and to communicate the risks effectively. Therefore, the advantages of using cognitive mapping are that it will particularly facilitate the study by providing a visual representation of the issues associated with flood risks and help the effective communication of the study findings among different SME sectors. While cognitive mapping has been widely used to represent issues and can provide important insights to understanding the strategic issues, they are fundamentally limited in understanding behavioral implications (Kim, 2000). Further, Ackerman et al. (2004) argued that using cognitive mapping cannot be undertaken effectively unless the interviews are well understood and organized properly.

According to Eden and Ackerman (1998), cognitive maps are generated from interviews by breaking down an account into its constituent elements, which are then reconnected to represent the account in a graphical format. Eden and Ackerman provided a set of guidelines to develop cognitive maps from interviews. For the present study, the following disciplines and steps were applied:

- Interview transcripts were coded by scrutinizing for meaningful content categories related to a particular concept, usually distinct phrases of 10-12 words, which contain the language of the interviewee providing the account.
- When a new concept was identified, a code was assigned; or codes may be united in a single concept where one provides a meaningful contrast to the

other. This process was followed in the absence of new concepts. Thus, all “free nodes” were transferred into hierarchical “tree nodes”.

- “Tree nodes” link the structure of concepts in a logical manner to form a hierarchical structure.
- Cognitive maps were generated by using the modeling function manually.
- Meaning retained through the context was completed based on the views expressed by the interviewees as well as how the issues were viewed by the researcher.

### **3.7 Validity and Reliability**

In meeting the criticism of case study, regarding the limits of establishing reliability or generality of findings, its validity and reliability are established by following the tests of construct validity and reliability (Yin, 2003b). According to Yin (2003b), construct validity refers to establishing the correct operational measures for a specific study, in which, multiple sources of evidence are used to ensure the construct validity. The present research employed multiple sources of evidence, such as literature review, a questionnaire survey, and case studies. Also, the interviewees to confirm that their views were accurately reviewed interview transcripts. As noted by Yin, establishing an appropriate research methodology from the beginning to the end of the research study is important in ensuring construct validity; this has been achieved for the present research through this chapter. Yin also suggested that the use of the protocol and case study databases could establish the reliability related to the operations of a study. These approaches were employed within the present research in keeping a record of all activities throughout the study.

### **3.8 Ethical considerations**

It is important to ensure that approval by the ethics committee or institutional review board is sought before the research is undertaken. This is to determine that participants’ welfare and rights are protected and ethical principles are being adhered to (AUTEC, 2004). It is also important to note that ethical issues could often arise at different stages of the study, and may require being discussed accordingly, to construct a reliable and valid research (Burns & Grove, 1999). In order to follow the ethical approval procedure, the researcher must provide evidence such as approval of the

research design and research methodology tools, in addition to submitting an ethics application through the Auckland University of Technology Ethics Committee (AUTEC). The ethics application for the present research was submitted in March 2016, and the ethics approval was no.11/48 (see Appendix B), in conjunction with points of satisfaction raised by AUTEC. Ethical considerations issued for this research include those for informed consent, confidentiality, and social sensitivity.

### *3.8.2 Informed Consent*

The moral principle of informed consent is very important for participants, and they should always have the right to give informed consent regarding their participation in any research. The participants should be fully aware of the purpose of the study, what sort of information is sought, and the implications for them as contributors to the research. Therefore, the participants have the right to withdraw from the research at any time (Beauchamp & Childress, 2001).

The primary researcher clearly informed the participants the details of the research using the Participant Information Sheet (refer Appendices C & D). The details in this form include the research aims and objectives, the voluntary nature of research participation, and the ability to withdraw from the process at any time. During the events of ‘opening up’ and discussion, the participants could experience rekindling tragic or uncomfortable experiences related to the issue being studied. Therefore, process consent is a useful tool that is used to ascertain whether participants are comfortable continuing with the process, or if they prefer to discontinue their on-going participation (Polit & Beck, 2006). Informed consent was obtained using signed consent forms provided by AUTEC to the participants (refer Appendix E). All of the participants were also asked to mark on the form if they preferred to receive a copy of the final report.

### *3.8.3 Confidentiality*

The researcher must assure participants that their identities will not be revealed to readers, and that the raw data will not be revealed to any third parties (Parahoo, 2006). The privacy and confidentiality of the participants will be respected at all times; their names and addresses will not be sought. The participants will also be informed of the importance of not discussing ‘who said what’ with anyone. No third party has access to any of the data collected through this research. Confidentiality of all participants

will be protected by limiting the access to fieldwork notes, participant-generated data, and interview transcripts to the applicant and the primary researcher. All data will be stored in a locked cabinet in the primary researcher's AUT office, and will only be accessed by the primary researcher and the research supervisors. If there is any personally identifying information, it will be deleted or changed as necessary on transcripts and written materials and reports. The researcher and the research supervisors will be the only people who will have access to the consent forms. These will be stored for six years and destroyed.

#### *3.8.4 Social and Cultural Sensitivity*

The researcher was born and spent most his life in Thailand and has lived in the province being studied. Therefore, the researcher was well acquainted with the cultural and social protocols in the area as a geographic and cultural 'insider'. It is a challenging task for the researcher to collect data in his home country sub-sequent to the process of obtaining government permission and local authority approval.

After arrival in Thailand, the researcher initially visited the Provincial Administrative Organisation of Ayutthaya. The Administration provided the addresses for individuals for a potential sample population in the area, which was an invaluable source of information in conducting the present research. The researcher introduced himself including his background and the purpose of the research and provided a letter of permission (see Appendix F). The researcher received useful information from the authorities and was advised to contact a Domestic Industry Department and a Provincial SME Center. The subsequent step of approaching a target group using the door-to-door survey was challenging, due to the uncertainty of the response of individuals regarding unsolicited surveys. The Sub-District Administrative Organisation (SAO) was a useful source of information. The researcher was recommended by the official local authorities in the different areas being studied and was guided to the relevant addresses and locations in the area. Overall, the positive cooperation between the researcher, authorities, and respondents was instrumental in conducting the research effectively.

### **3.9 Summary**

Selecting a suitable research methodology and establishing a good research design are important to address a research problem and to meet its objectives; they are vital in establishing research validity and reliability. The present chapter has reviewed the philosophy, stance, research approach, research strategy, research choice and research techniques used and established the reasoning behind the selection of the methodologies. The following chapter will present and analyze the primary data.



## CHAPTER 4 – RESULTS

### 4.1 Introduction

Chapter two reviewed the literature on organizational resilience and the conceptual framework. Chapter three providing a description of the research methodology used in this research followed this. This current chapter presents the findings of the study in order to address the following three objectives:

1. To explore the impacts of flood events experienced by SMEs.
2. To identify the measures and actions implemented by the SMEs to cope with and adapt to flood risk.
3. To investigate the drivers that guide the SMEs in implementing measures and actions to cope with and adapt to flood risk.

Based on the mixed method research employed, the results draw on the data from questionnaire surveys and two semi-structured interviews.

### 4.2 Demographics of the Survey

An exploratory questionnaire survey involving SMEs from different industry sectors was conducted to inform the subsequent case study and to critically analyze issues of flood risk, coping measures, and adaptation. The findings of the study survey are analyzed and discussed in the following sub-sections.

All of the businesses within the SMEs sample were small-sized businesses. This is because a significant majority of SMEs in the different sectors are sole-proprietorships or family businesses. Given that the study sample comprises solely small businesses, the findings of the present research will demonstrate how SMEs adapt to flood risk.

The questionnaire survey was conducted involving 10 SMEs that represent different industry sectors (see Figure 9, p. 41). A majority of the total sample was from the ‘Wholesale and Retail Trade and Repairs’ (55%) and ‘Service sector’ (27%). The representations from other areas, such as the ‘Manufacturing, and ‘Other’ sectors including ‘Agriculture’ were significant (9% of the total sample each) but comparatively less. It can be noted that the survey samples of the present study reflect the reality of Thai SMEs. Regarding the percentage of Thai SMEs classified by sectors, the highest, 99.30%, were wholesale, retail, and automobile repair. There were

98.89% of SMEs in the service sector and 86.75% of SMEs in the manufacturing sector, constituting all the country's SMEs (OSMEP, 2015)

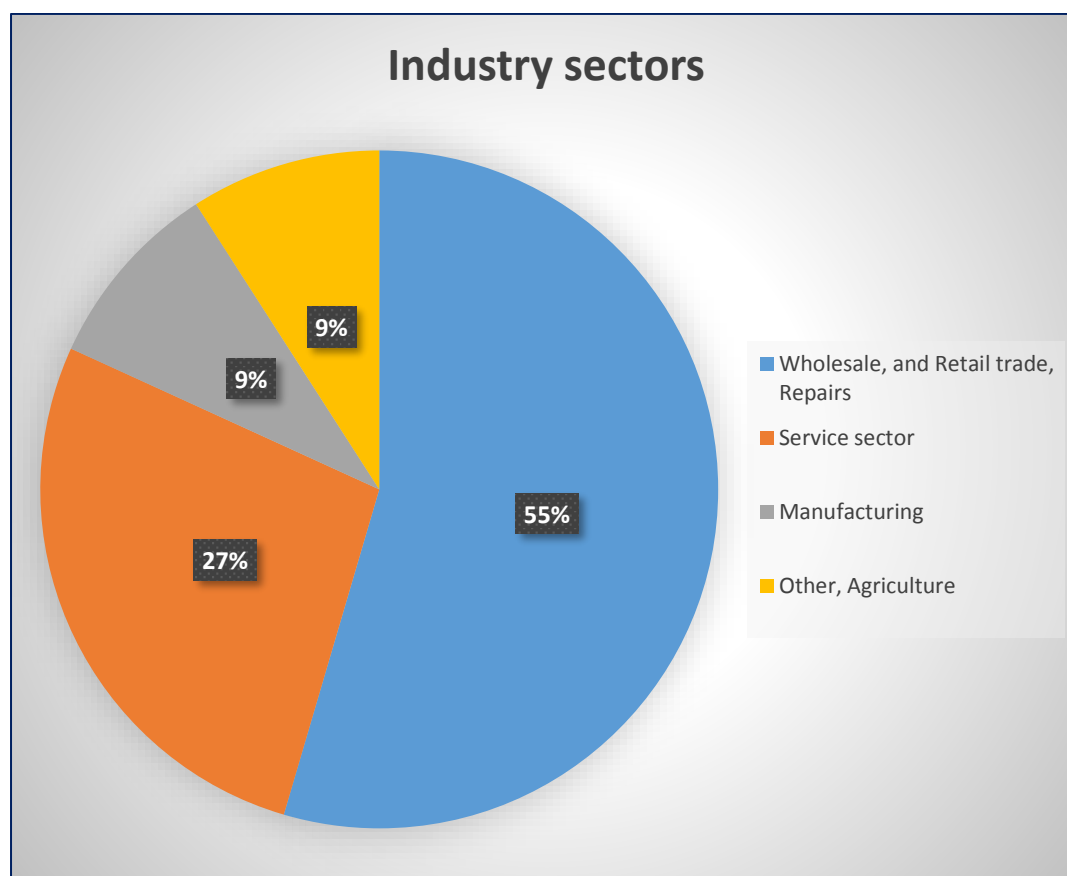


Figure 9. Percentage of SME sectors within the total sample

### 4.3 The Impact of Flooding on Thai SMEs

This section presents the findings in relation to small business impacts of flooding. The first part of the study involves the findings from questionnaire-based surveys and the second part of the findings presents from two semi-structured interviews.

#### 4.3.1 The Impact of Flooding on Thai SMEs Surveyed

Based on questionnaire surveys, the findings revealed that all the impacts of flooding on SMEs were negative. In one section of the questionnaire survey, respondents were questioned on the effects experienced by their businesses due to the flooding event (Figure 10, p. 42), which highlighted three predominant effects: 1) loss of products and services (16%); 2) product distribution disruption (12%); and 3) the number of customers affected by transport and the absence of customers (12%). Although general

options were given in the survey, none of the SMEs surveyed reported any positive effects of flooding in the questionnaire form.

As Figure 10 demonstrates, supply chain disruptions related to flooding can also affect SMEs. Ten percent of the SME respondents reported experiencing disruptions to their supply chain because of flooding events, as well as direct property damage. The findings of the survey also revealed indirect impacts that were experienced by SMEs. These include: staff affected by transport (about 8%), increased the cost of input resources (8%), changes in government regulations (4%), and increased the cost of insurance (2%).

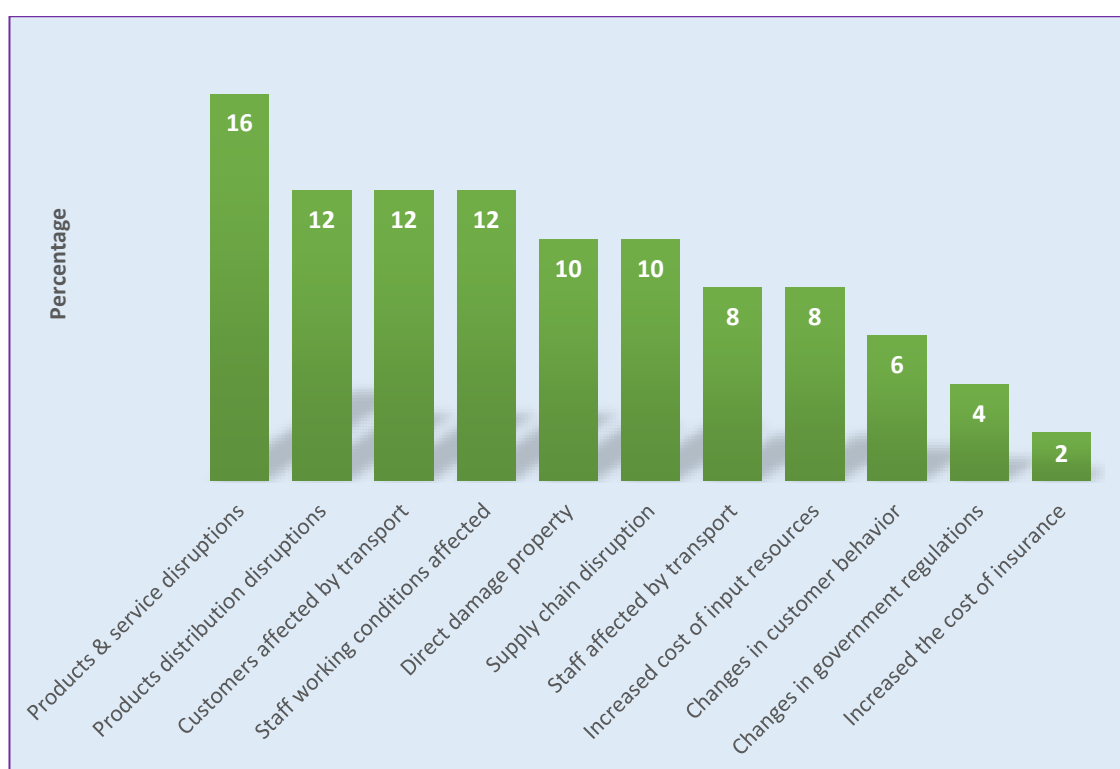


Figure 10. The impacts of flooding on SMEs

#### 4.3.2 The Impact of Flooding on Thai SMEs (semi-structured interviews)

The second part of the research involved the two semi-structured interviews, which are explained below. These sought to further investigate the research question and clarify some of the issues identified during the questionnaire survey. Semi-structured interviews were conducted with personnel representing the organizations that were

selected for the case studies. This section details the findings of the first case (SME1) and describes the second case (SME2).

#### 4.3.2.1 Case SME1

As stated in chapter three, the first case focuses on a small-sized business organization, the findings of which are detailed in the following sections.

SME1 is a sole trader-owned small business in the production of drinking water (refer Table 6 for SME 1 profile). It is located in the central province; approximately two kilometers from the Chao Phraya River (see Figure 11, p. 44). SME1 is an established drinking water production facility with about eight years experience and provides its services to the local community and nearby areas. This organization has an employee base of 10 and an approximate annual turnover of less than 1.4 million USD; it is therefore classified as a small-sized business (see chapter one). The management structure comprises a limited number of organizational structures, resulting in a short management chain, where strategies and significant operational decisions are made directly by the owner.

The business premise is a four-floor commercial building. The premise is used for multiple purposes; i.e. as a showroom, office, storeroom, and water production room (see Figure 12, p.44).

Table 6. The profile of SME 1

<b>SME</b>	<b>Number of employees</b>	<b>Flood experience</b>	<b>Respondent</b>	<b>Age of business</b>	<b>Property of ownership</b>	<b>Main business activity</b>
1	10	First directly affected	Owner	8 years	Lease	Produced a drinking water shop

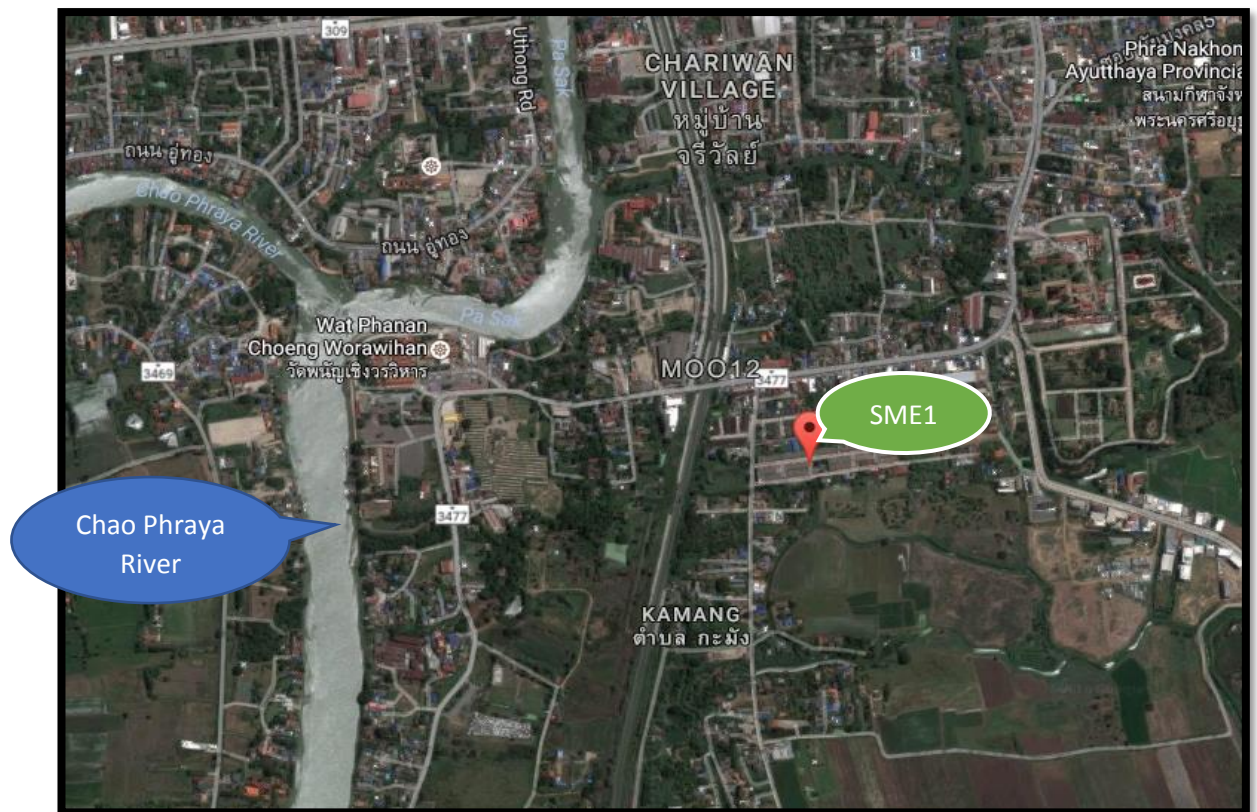


Figure 11. Location of SME1 in Soi Thung Thong Village, Ayutthaya (Google, n.d.)

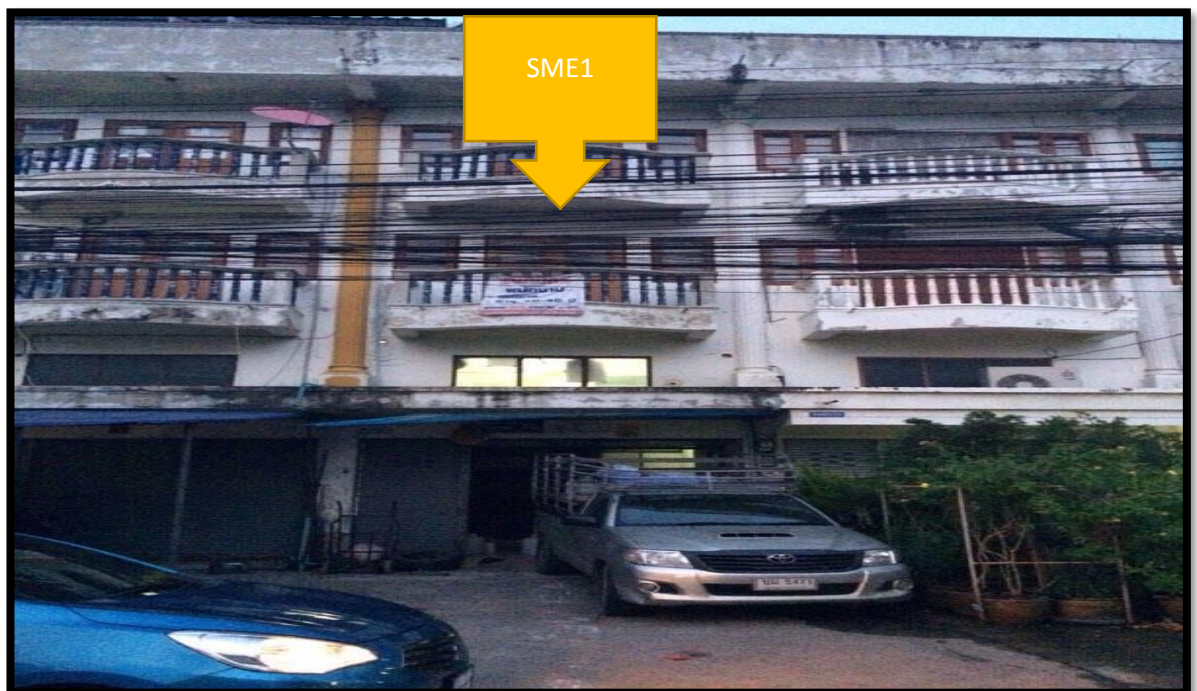


Figure 12. A four-story building of SME1

The business was flooded in 2011, within the third year of its establishment, and was put out of business for two months. The flood depth inside SME1's premises rose to over one meter. As a result, a water pump, drinking water packages, and other equipment were damaged and had to be replaced (see Figure 13). As the business did not have property insurance cover or business continuity insurance, it lost its income for the entire period it was out of the business. The post flooding structural survey revealed that the building was quite new and no structural damage had occurred. The owner claimed that the premises had been flooded for two months, which resulted in a struggle to produce drinking water, due to lack of electricity and water supply (see Figure 14, p. 46).

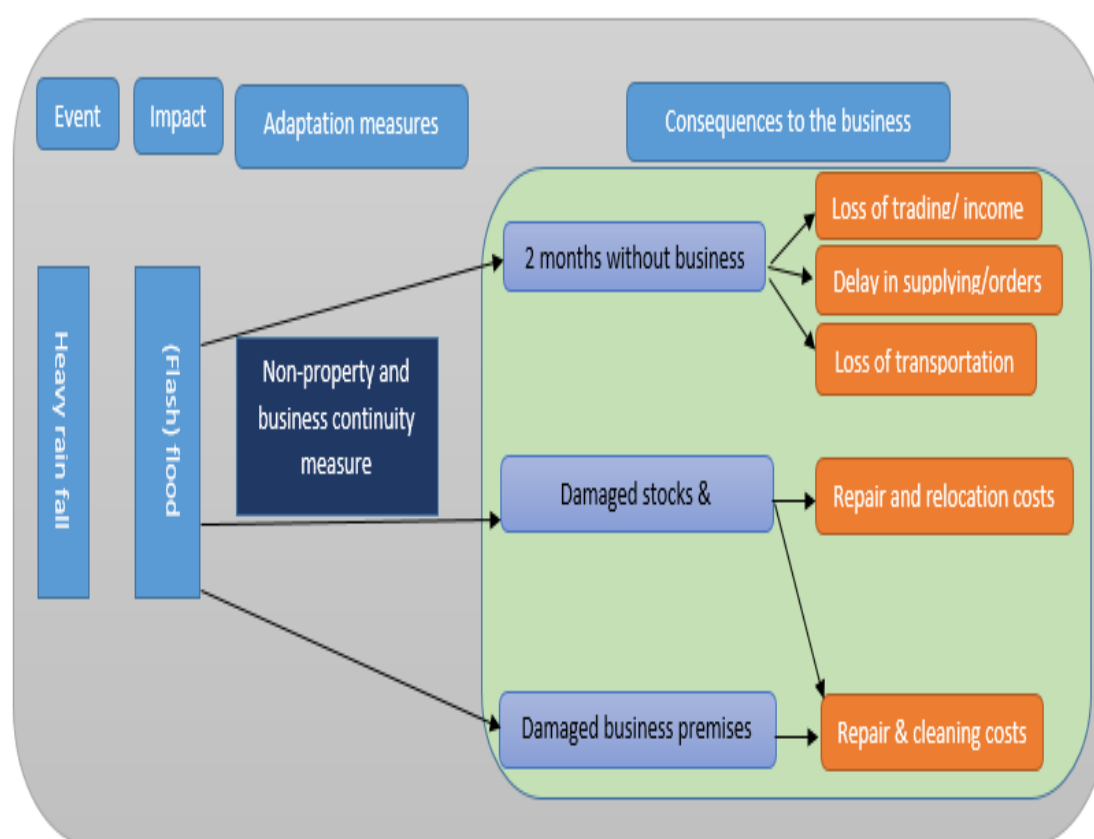
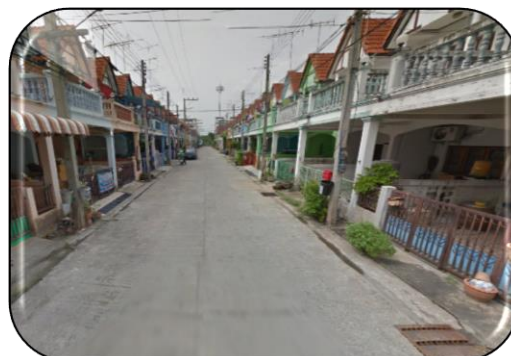


Figure 13. The main consequences that SME1 suffered by the flood event





**A street in front of SME1' building  
before a flood in 2011**



**A village located by SME1 in  
Ayutthaya before a flood in 2011**



**A flooded area inside a village located  
by SME1 ( the first day of a flood on  
October 10, 2011)**



**The first week of a flood in front of the  
village located by SME1 on October 11,  
2011**

*Figure 14.* An example of pictures from SME1affected by the 2011 flooding in Ayutthaya, Thailand

Some direct quotes of the owner of this SME, when asked about the major consequences of the flooding, are given below:

“During the 2011 flood event, my income was significantly reduced as water restrictions had a significant impact on the productivity and product distribution.”

“All my employees had to stop to work during flooding.”

“During flooding, the road ahead was completely submerged under at least 2 meters of water, and a boat was the best way to access this building.”

“There were no power and water supply from the area I lived for a month. This meant that I could not run a business for long periods.”

Loss of lifeline services such as electric, water supply, and transport could cause indirect impacts.

#### 4.3.2.3 Case SME2

The second case focuses on a small-sized business organization, the findings of which are detailed in the following sections

The second case study, SME2, focuses on a privately owned, small and medium-sized, retail construction shop that has been in business for approximately six years. It is located in the central province; approximately 0.5 kilometers from the Chao Phraya River (see Figure 15, p. 48). SME2 is involved in distributing construction tools and equipment. This organization has an employee base of 15 and an approximate annual turnover of less than 1.4 million USD and is therefore classified as a small-sized business (see chapter one). The management structure has a limited number of layers, and a short management chain, where strategies and significant operational decisions are made directly by the owner. The first floor of the business premises is used as a showroom, and the second-floor functions as an office (see Figure 16, p. 48). Space outside of the office is also used, for storing construction equipment and engines. Table 7 summarizes the details of the organization.

Table 7. The profile of SME 2

<b>SME</b>	<b>Number of employees</b>	<b>Flood experience</b>	<b>Respondent</b>	<b>Age of business</b>	<b>Property of ownership</b>	<b>Main business activity</b>
2	15	First directly affected	Owner	6 years	Own	A retail construction shop





Figure 15. Location of SME2 in Bang Pa-In district, Ayutthaya (Google, n.d.)



Figure 16. A building of SME 2

#### 4.3.2.4 Consequences of the previous flooding on SME2

In the case of SME2, geographically the business is located on low ground below the flood line, about 500 meters from the Chao Phraya river and the organization has considered a flood measure. For example, although this business opted for a property-level measure such as land reclamation, which raised the premises by up to two meters, it was still flooded, with the floodwaters rising to a height of approximately three meters. The business was flooded for the first time during the same year as its inception (2011), and in this instance, the SME2 did not receive any warning of the flooding (see Figure 17). The owner managed the effects of the floods by himself, evacuating the shop as the flood level became dangerous. As a result, most of the stock was damaged. These events disrupted the business for about three months and required one further week to start trading fully again. Figure 18 (p. 49) shows the pictures suffered by SME2 from the flood event. Below are some direct quotes from the owner of SME2, when asked about the major consequences of the flooding:

“I ran around like headless chickens during the flooding water were coming to my properties. I had only 5-6 hours to relocate all things outside. As a result, many kinds of stuff were left to be flooded. I felt so sad at that time.”

“Some documents were lost and damaged during flooding.”

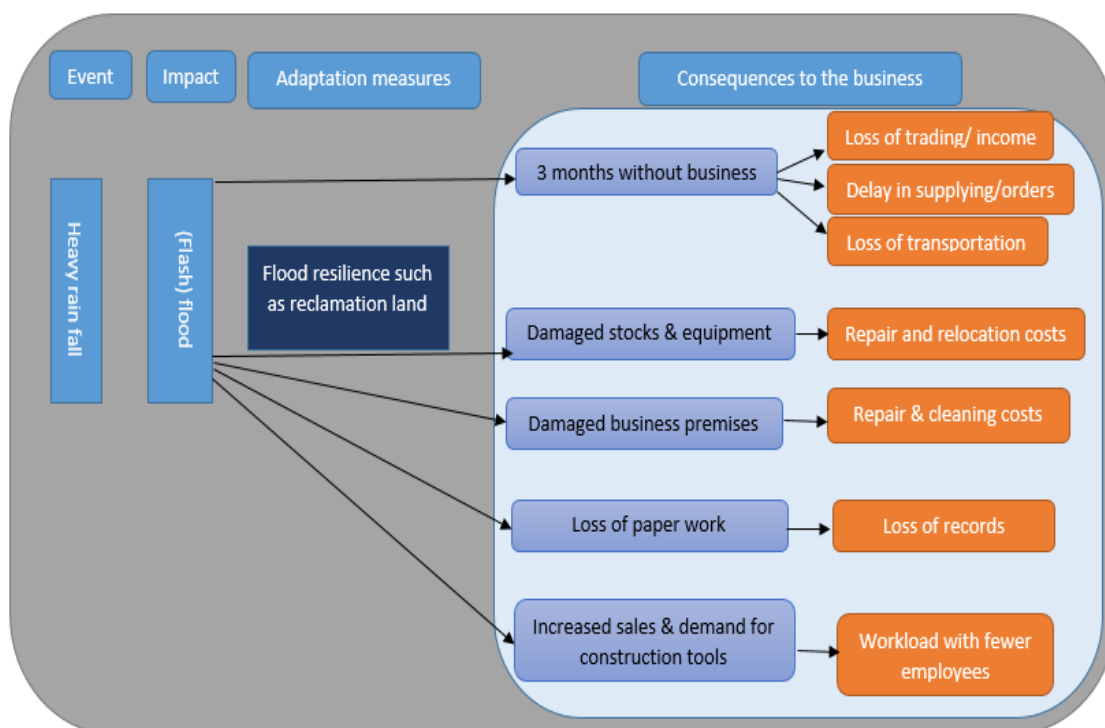


Figure 17. The main consequences that SME2 suffered by the flood event



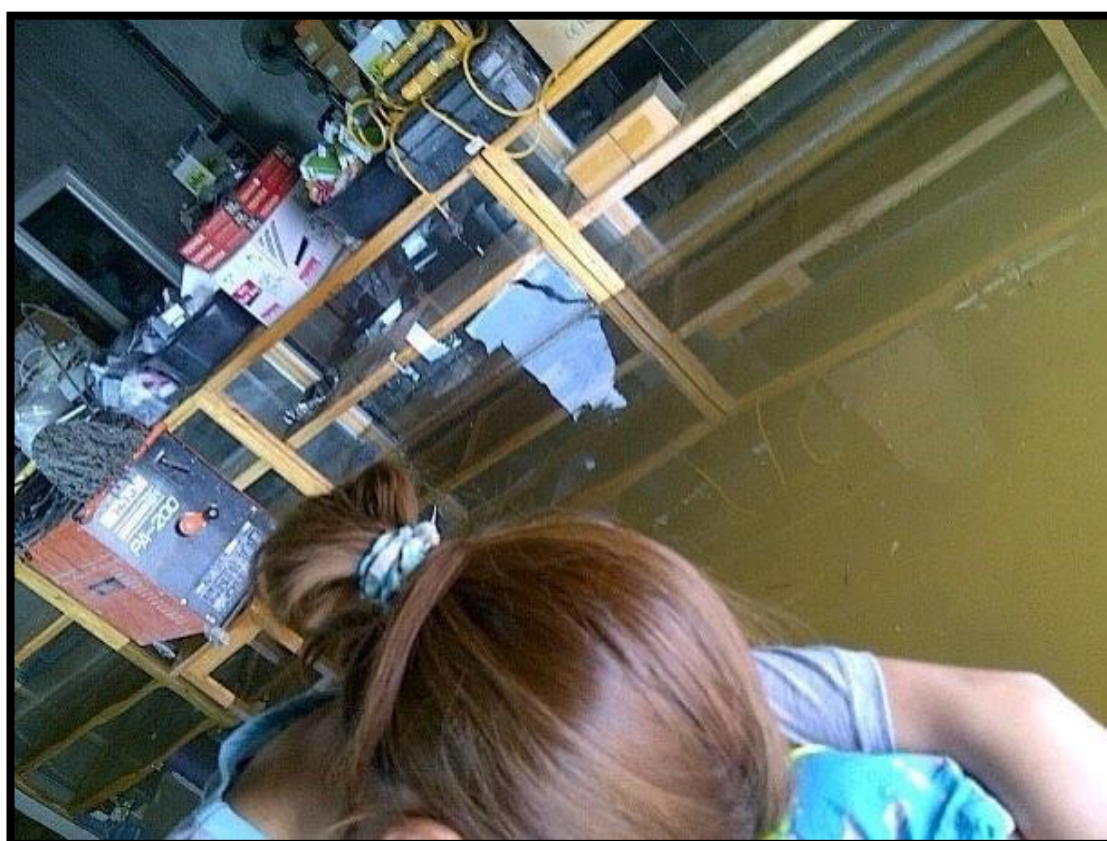


Figure 18. Post-flood pictures of SME2

Because SME2 had not implemented property insurance or business continuity insurance, the damages resulted in a loss of income for the entire period it was out of business. However, the owner claimed that the company managed to reach pre-flood status after recovery, and progressed even further by doubling the revenue compared to that before the flood event, due to the increased demand for construction equipment resulted by the cash/vouchers granted by the government for repairing houses (4,000 baht per household). This appears to be a positive consequence of a flood event although he failed to mention any positive impacts when questioned by way of the survey. The owner stated:

“Luckily, people were much more buying construction tools from our shop because the government provided supplemental cash to affected households. As a result, there was much margin for us.”

### 4.3 Existing and Future Coping Strategies

This section presents the findings in relation to coping measures and actions implemented by the SMEs to cope with and adapt to flood risk. In both, the surveys and the two cases with semi-structured interviews, small businesses were asked what measures they had taken to protect their businesses, the results of which are explored below.

#### 4.3.1 Existing Coping Strategies of Flood Risk on Thai SMEs Surveyed

When questioned about what current measures the SMEs have taken to protect their businesses from the effects of floods, about 70% of the flood-affected SMEs reported implementing at least one measure since experiencing flooding. A significant number (30%), however, had not implemented any action. The actions predominantly undertaken for flood protection were the improvement of premises (31%), preparing stock, and equipment relocation (15%). Only a handful of business had implemented specific flood protection actions such as obtaining property insurance (8%), developing a flood plan (8%), or installing flood defenses, such as sandbags (8%).

In comparison, half of the small businesses that were not affected by a flood event have commonly made improvements to their premises to protect themselves during floods, such as installing shelves or raising sockets. More than 25% of SMEs reported measures such as stock and equipment relocation, and developing a flood plan, as commonly implemented coping strategies. It must be noted that there are two groups

of SMEs (i.e. those with flood-related experience and those without) in implementing property-level flood protection strategies. Both groups of SMEs – irrespective of being affected by flooding events – seem to rely on property-level protection strategies rather than business continuity strategies. It is also noteworthy that, while none of the SMEs has opted for BCP, only a few have opted for developing a flood plan.

While a majority of the SMEs (66%) considered implementing at least one measure of flood protection against the impacts of future flooding events, 33% stated that they had not implemented any coping strategies. Developing a business plan, a flood plan, and premises improvements were quoted as measures the SMEs would consider implementing shortly, albeit at a very low level (only 13% respectively). An even lower proportion of SMEs (only 7%) considered property insurance or stock relocation (see Figure 19).

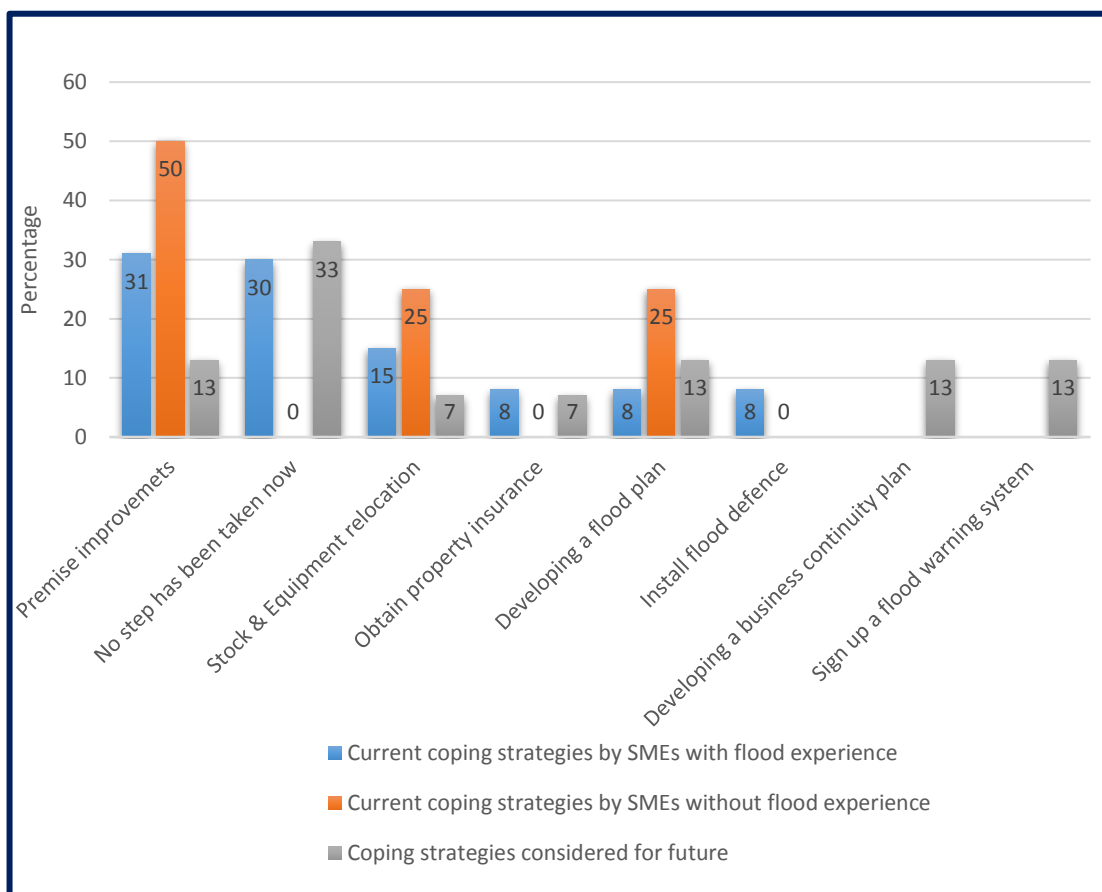


Figure 19. Existing and future coping strategies against flood risk

#### 4.3.2 Existing Coping Strategies of Flood Risk on Case SME1

Following the flood event, SME1 (the drinking water business) implemented a range of adaptation measures. As illustrated in Figure 18, these include: implementing

property-level measures, such as relocating a water pump from the ground floor to the fourth floor, installing store shelves above 1.2 meters on the first floor, raising electricity sockets by 1.2 meters, and relocating the stock room from the first floor to the second floor. Following 6 months later (April 2012), the business owner decided to relocate in another area where was located in less flood-prone areas.

The owner also claimed that the usual rent and rates incurred to run the business were regularly charged for the entire time the business was closed. The owner was dissatisfied with the support received from the support networks and the government, because of the entire burden, such as the absence of income, the expenses of rent and rate, and the costs of repairing and restoration, had to be borne exclusively by him (see Figure 20).

He further reported, “Although I did not hire my employees during the flood, I was responsible for extra costs such as renting, cleaning, repairing and replacing structural works.”

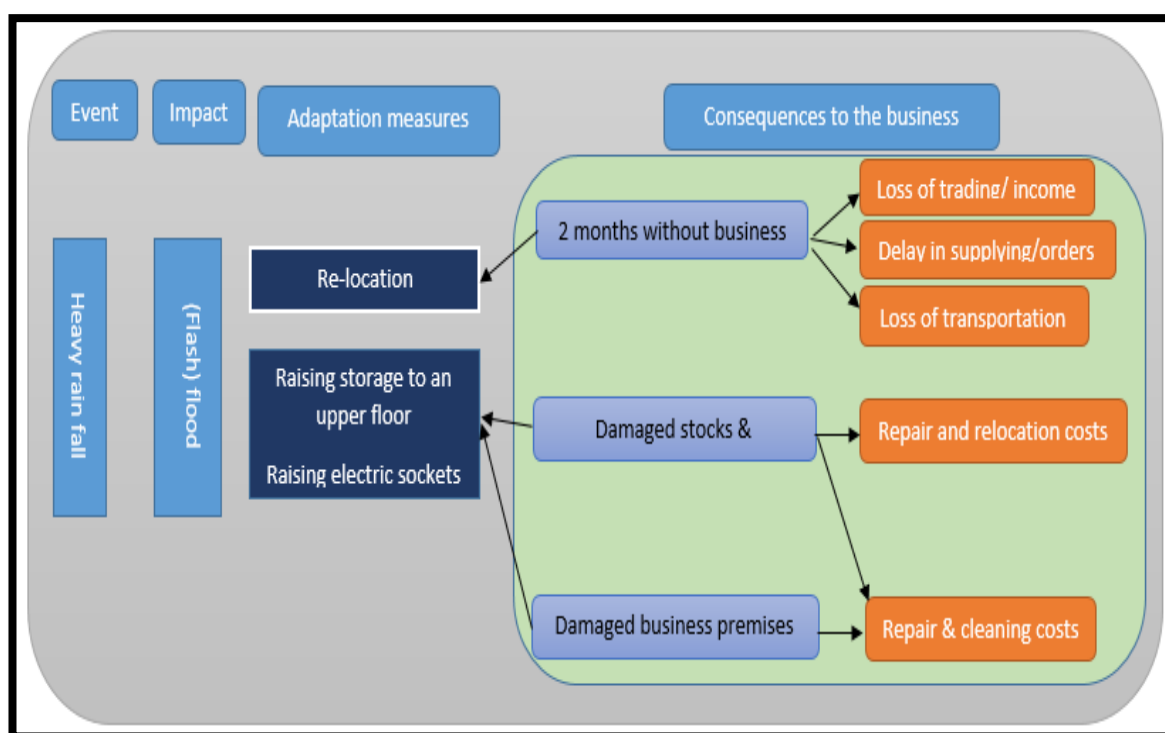


Figure 20. The impact of flooding on SME1 and the adaptation measures implemented by SME1

#### 4.3.3 Existing Coping Strategies of Flood Risk on Case SME2

The previous flood event has made the owner of SME2 aware of the severe impact flooding can have on business and most of his equipment (See Figure 21). SME2

utilized the opportunity presented by the 2011 flood event to upgrade the property for business. The owner implemented property-level measures such as a revised electrical system and a water supply system that were raised by over one meter (See Figure 22, p. 55).

SME2 has a business plan in place encompassing emergency planning, the roles and responsibility of personnel, and steps to be followed during an event of flooding. The plan has been developed after the flood event but has not been tested yet. Therefore, it is difficult to guarantee the effectiveness of the plan in the case of future flood events. He explained:

“Before the 2011 flood event, I built my office on a landfill, rising up two meters to reduce the flooding.”

“After the flood event, I spent my budget to repair and set a new system of electric and water networks; the controlled systems were installed on the upper floor.”

“All documents were stored on the second floor of my office, and I keep extra documents in my house.”

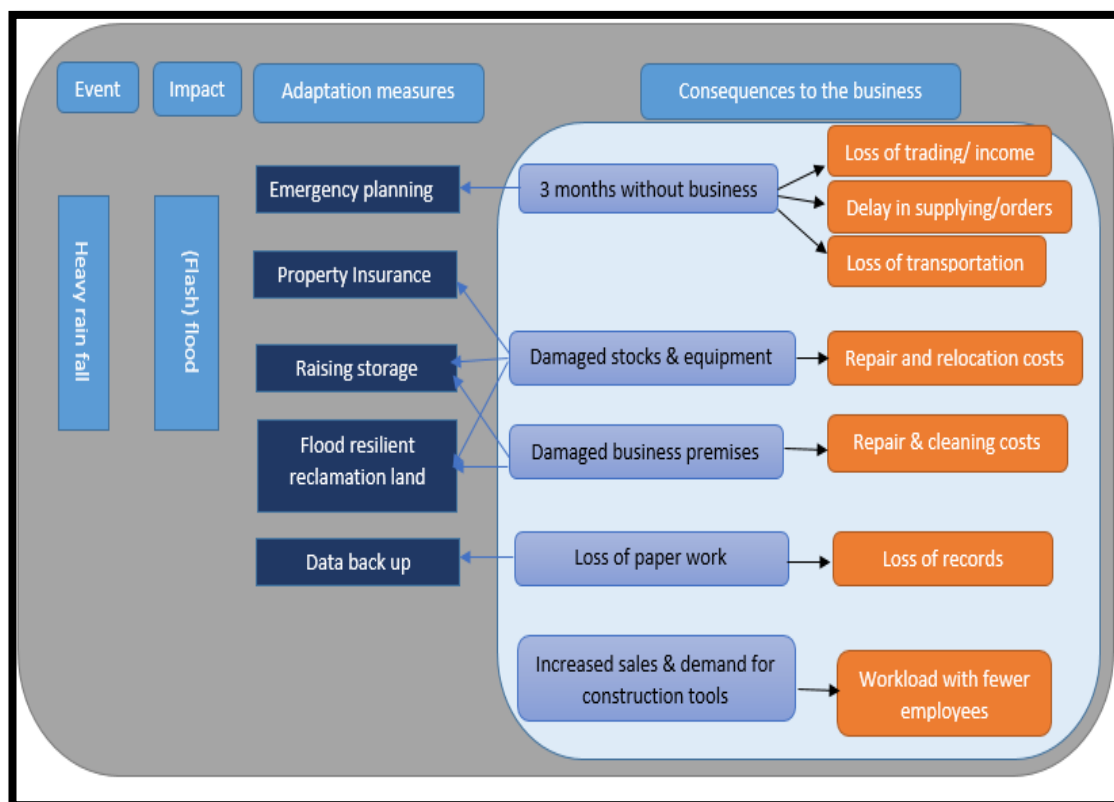


Figure 21. The impact of flooding on SME2 and the adaptation measures implemented by SME2





Figure 22. An example of measures from SME2 to adapt to flood



#### 4.4 Key Challenges of Coping Capacity

This section explores the key challenges that constrain and influence the adaptive capacity of SMEs in implementing coping strategies during flood risk. Findings from the two semi-structured interviews regarding challenges are presented below.

##### 4.4.1 Case SME1

The owner of SME1 was questioned about the challenges of implementing coping measures following the flood events. SME1 has not covered every consequence related to the previous flood event. Despite the various other measures that were implemented, the business owner did not consider business continuity strategies. Additionally, insurance was not considered as an option as the owner believed it to be too expensive in comparison to the business' income. He explained:

“Insurance was too expensive for my business compared with my annual revenues, so I preferred to relocate my business to another area.”

“I don't think insurance will cover all the impacts and I don't know there is flood insurance.”

This common theme was highlighted as the level of under-insurance associated with the findings of the questionnaire-based survey. SME1 mentioned that he had limited ability to cover the costs of impacts from the flood event due to resource constraints. He explained:

“My firm is so small and I had only 7-10 employees.”

“I have established my firm with my own fund, so I don't have other financial resources to support me during a difficult time.”

“It is difficult to get financial supports from a bank due to many documents required.”

SME1 was aware, however, of flood barriers such as sand bags, floodgates, and resilient flood flooring; and planned to raise the options with the property owner of examining applicable permanent protection measures in preparation for potential future floods. However, there was no plan in place to deal with flood events.

“I rent a building from the landlord; therefore, it was the responsibility of the landlord to protect an outer building.”

“I don't have any risk management plans at the moment. It will be great if I can learn or train from someone.”

#### 4.4.2 Case SME2

The owner of SME2 was questioned about the challenges of implementing coping measures in the aftermath of such an event. SME2 has implemented various coping strategies in his business properties. To overcome the challenges, the owner of SME2 demonstrated solving constraints of the adaptive capacity in many ways.

The adaptive capacity of SME2 is likely to be more effective than SME1. When considering the size of business and support networks, SME2 demonstrated that his business made it easier to access funding and other resources in order to continue business. He explained:

“Luckily, I had a good network of my friends. I could not sell some construction equipment due to flood damages, but I asked help to send some tools and equipment that I need. Therefore, I was still selling those and I could run my business.”

“Additionally, we had a good cash flow and I run two businesses at that time. Therefore, I could utilize the budget from one to another comfortably.”

SME2 was aware of future flooding events. The owner of SME2 mentioned that despite having community-level flood protection measures, such as riverbanks along the Chao Phraya River, floods will repeatedly occur in the future. In addition, despite the higher costs of the insurance package, the business owner had made the decision to take property insurance and claimed that the insurance will provide a preventive measure to help the business recover as quickly as possible if it was flooded again. These quotes illustrate his position:

“I didn’t think river banks, dams, and government flood management could completely protect my property from the flood. You could see from the previous flooding, it could not protect my place at all.”

“I made a decision to buy property insurance because the flood was likely to occur every year and at least I could get compensated from the insurance.”

In addition, SME2 demonstrated his working experience through implementing a risk management plan in the aftermath of the flood. He developed a flood plan in order to cope with future floods. He explained:

“Before run-off water comes I had only five hours to move out from my store. It was confusing because I was not aware of the flood and I did not make any plan to manage it at that time. I was an engineer and worked as a safety man, so I developed an emergency plan and assigned the duty to my staff in order to work effectively.”

#### **4.5 Summary**

The findings of the questionnaire survey suggest that most SMEs in Ayutthaya, Thailand, are likely to experience both direct and indirect impacts of flood events. Of these, the indirect impacts were the most significant, for example, product and service disruptions, travel difficulties for both customers and staff, and supply chain disruptions. A majority of SMEs implemented coping strategies, of at least one measure of flood protection measures, in order to protect themselves from flood risk. However, the overall number of SMEs that implemented coping strategies against flood risk was still low. The two SMEs that were used as case studies revealed that their businesses were significantly damaged by flooding. Although they have implemented different flood adaptation measures, they are still prone to be negatively affected by flooding. For example, SME2 implemented a combination of property-level protection and generic business continuity measures; whereas SME1 only opted for property-level protection measure. The next chapter seeks to analyze the evidence in answering the proposed research question.

## CHAPTER 5 – DISCUSSION

### 5.1 Introduction

The findings from this present study were detailed in the previous chapter. The present chapter discusses the results and develops the evidence for answering the research question. The findings from the semi-structured interviews with two case studies are analyzed comparatively, drawing elements from the questionnaire survey and the literature review. The following sections discuss each objective and present several recommendations. This chapter also discusses the limitations of this study and provides recommendations for future research.

### 5.2 The Impacts of Previous Flood Experience on Thai SMEs

The present study investigated the impacts that floods can have on Thai SMEs. Three key points can be learned in relation to business impacts of flooding. Firstly, over 70% of the respondents of the questionnaire surveys identified the indirect impacts to be the most significant impact of flooding on SMEs. These include products and service disruptions, travel difficulty for both customers and staff, and supply chain disruptions (for many SMEs in Ayutthaya). Although some SMEs were not flooded, they were unable to function as usual when the surrounding premises were affected and access was limited. In addition, limitations of lifeline services, such as electricity, water, and telephones, could also limit their function. SME1 reported their inability to run the business of drinking water, as they were unable to access water and electricity sources. These results are comparable to the findings that were reported in several other international studies as well as discussed in chapter one. For example, many Australian SMEs lost their business incomes and customers due to the delays in the repair of critical lifeline services (Kuruppu et al., 2013). Similarly, a report of small businesses and flood impacts in Cocker mouth, in the UK, identified the loss of critical lifeline services relating to flood events to be instrumental in business closure (Wedawatta et al., 2013).

The second major impact of floods on Thai SMEs is that most businesses are likely to experience multiple impacts of a flood event, rather than a single incident. For example, the direct damage to premises can create financial problems including the additional costs for repairs, input resources, and increased insurance costs (Tiernney, 2007; Whittle et al., 2010). For instance, SME1 decided to relocate to an adjacent

district, and SME2 claimed that stocks and equipment on the ground floor were damaged during the floods, resulting in increased budgets for equipment repairs, relocating costs, and cleaning of premises. These may be classed as ‘secondary flooding’ or latent effects of flooding (Whittle et al., 2010). Tiernney (2007) indicated that economic ripple effects could result from flood damage due to both property damages and temporary business closure. This can lead to a loss of jobs, loss of income, and delay recovery. Similarly, other research has revealed that flooding of property could lead to a range of impacts including the loss of records, damage to equipment and property, and relocation to a temporary place (Metcraft & Jenkinson, 2005; Pitt, 2008; Wedawatta et al., 2013).

While the negative impacts of flooding on SMEs are evident, flood events also generated a few short-term positive economic outcomes, and benefit certain SMEs. For instance, SME2 (a construction retail shop) in Ayutthaya observed an increased demand for their services and higher sales after the floods subsided. They reported their sales to have doubled due to the high demand for repairing houses and property. However, it was reported that it was difficult to manage this demand due to lack of employees and associated increase in workload. The literature notes that some weather extremes might create windows of new business opportunity, given that disasters produce reconstruction booms (Tierney, 2007; Webb et al., 2002). Dlugolecki (2004) reported that some trades, like construction industries, would also benefit following disaster impacts because of the increased need for reconstruction and the need to build more robust structures that withstand floods in the future.

The information gathered in this study provides important key points that can be considered by Thai authorities in future policy making that are associated with flood risk management. Thus, the emphasis and contribution made by this study are to enhance the current understanding of SMEs on preparedness for flooding by considering both direct and indirect impacts. Support organizations, such as local governments, should develop and set up a systemic program, including timescales and expectations, to reduce the disruption, with emphasis on factors such as lifeline services for businesses, by publishing a national framework and policy statement (Directors, 2003). The findings of the impacts can inform and assist support organizations in enhancing the preparedness of SMEs to future flood events.

### **5.3 Identifying the Response of SMEs to Flood Risk and the Measures Undertaken to Manage Flooding Risk**

In 2011, a major flood occurred in Ayutthaya, requiring small businesses to implement a range of flood coping strategies. Three points can be made in this regard.

Firstly, the findings of the questionnaire survey revealed that SMEs had not considered the risk of flooding in their business planning and the need to implement processes such as BCP and property insurance. The results of the survey further revealed the number of SMEs that had implemented a range of property-level flood protection measures, in general, to be low. Several previous studies, conducted internationally, revealed that small businesses are less likely to prepare for natural hazards in comparison to their larger counterparts (Crichton, 2006; Woodman, 2008). For example, Berkhout et al. (2004) identified that small businesses found it difficult to consider both advantages and disadvantages of alternative adaptation measures unless they had previous flooding impact experience. Similarly, in another study, 90% of SMEs did not have adequate insurance coverage for their property (AXA Insurance UK, 2008), and only 30% of small businesses had a business continuity plan (Woodman, 2008). This could be partly due to the survey being conducted using samples that were scattered across Ayutthaya province in general, rather than being wholly concentrated to the specific high-flood risk or flood affected communities within the Ayutthaya area. In addition, the survey focused entirely on the SME sector and the respondents comprised entirely (100%) of micro and small businesses, which are less likely to take action when compared with medium or large businesses.

Secondly, the findings of the survey highlight that both groups of SMEs, with and without previous flood experience opted for property flood protection measures rather than business continuity strategies. SMEs without previous flooding experience were more interested in flood protection measures than those with previous flooding experience. In contrast, earlier research reported that SME owners with previous flooding experience were more likely to opt for flood protection measures than those without; those without previous flood experience were more likely to opt for generic business continuity strategies (Kreibich et al., 2008; Wedawatta & Ingirige, 2012). The very different results of this Thai study might be due to the small sample size of the survey (n=10), in which, only 20% of respondents were without flooding experience. The survey normally requires a larger sample size to ensure a

representative distribution of the population; therefore, it could be a lack of distinction with finding significant relationships from the data.

Conversely, this could be explained by the fact that business continuity strategies are a relatively new concept for developing countries like Thailand. As noted by ADPC (2014), BCP is a rare concept among Thai SMEs, and small sized businesses are less aware of business continuity measures than the medium and large sized businesses (ADRC, 2012; Wedawatta & Ingirige 2012). In addition, it could be that opting for property-level flood protection measures was found to be economical for SMEs only when the risk is high (Thurston et al., 2008).

Thirdly, it is worth noting that some SMEs did not consider implementing any coping strategies in both property-level protection measures and generic business continuity strategies in the future. Wedawatta and Ingirige (2012) asserted that such SMEs do not consider any coping strategies for several reasons. For example, the impacts of flooding are not significant enough to warrant any action, the SMEs do not consider a hazard that could affect them in the future, and the potential risk of a flood hazard is not a priority for their business. Further investigations are required to identify the barriers for implementing coping strategies.

In summary, the results of the questionnaire survey and the semi-structured interviews revealed that SMEs had low levels of coping strategies, particularly those with previous flooding experiences. For example, SME1, which was identified to have a lower level of coping strategies, had only implemented property flood protection measures, such as raising electric sockets, raising storage, and relocation. In comparison, given that SME2 opted for both business continuity strategy (e.g., a risk management plan, property insurance, and data backup) and physical improvements (e.g., reclamation land, improving water and electric systems and raising storage), its ability in implementing coping strategies was considered to be high. Thus, local authorities or support organizations should provide and share knowledge of property resilience measures, for example, by guiding the SMEs to use flood-resilient materials in building houses. In addition, support organizations should provide property improvement grants and loans to enable incorporating flood resistance and resilience products for properties (Thurston et al., 2008). This recommendation may be considered in areas where properties are at risk of flooding. It was also found that there

were few SMEs implementing business continuity strategies. Therefore, it is recommended that support organizations and local authorities promote property level flood resistance and resilience measures to businesses, to ensure business continuity. Further, a clear communication strategy from the government is needed to enhance the individual's understanding of the benefits of using flood resistance and flood-resilient materials (Directors, 2003).

#### **5.4 Investigating the Drivers that Guide Thai SMEs to Cope with and Adapt to Flood Risk**

This issue was discussed in-depth in the semi-interviews. The two short cases described in the previous chapter presented different perspectives on flood adaptation of SMEs. Both SME1 and SME2 had been impacted by flooding and implemented a range of measures. However, these were different. Notably, both the SMEs have incorporated different levels of property-level adaptations within their business risk management. For example, SME1 has only implemented property-level protection measures, whereas SME2 has opted for various property-level measures, property insurance, and a business risk management plan. SME1 is a drinking water production firm and SME2 is construction retail. It could be argued that business premises are important for both their business continuity and, especially, for SME2. The effects of the previous flooding on SME1 and SME2 were being out of business for two- and three months, respectively, and it would have been logical for SME2 to be more proactive in opting for property-level protection measures than SME1. Thus, the findings confirmed that previous flood experience is a key criterion that determines the coping capacity of SMEs in dealing with floods (Ingirige & Weddawatta, 2012; Thurston et al., 2008)

The perception of the owner can be highlighted as another factor that influences the post-flooding coping capacity of SMEs. The owner of SME2 said that his business was not adequately protected by community-level protection measures, and was covered by property insurance. Although SME1 did not opt for business continuity and property insurance, due to the high cost of the insurance package, they had opted for a range of property-level protection measures, such as raising sockets, raising shelves, and relocating the stock room to an upper floor. Also, the background of the senior management or the owners is noteworthy. For example, while the owner of SME2 had previously worked as a safety implementation officer and was familiar with



the risk management plans, the owner of SME1 had previously worked as a nurse and was not aware of what risk management entails. These differences have led the two SMEs to implement different generic continuity plans and property-level protection measures, which are reflected in their response to flood risk. Thurston et al. (2008), Norrington and Underwood (2008) and Wedawatta and Ingirige (2016) also highlighted similar situations, where the perception of the owner or senior management is suggested to act as barriers in implementing appropriate coping strategies.

The business size is another key point highlighted. SME1 had 10 employees (micro-sized business) whereas SME2 had 15. This would have enabled SME2 to address the risk of flooding, and it would have been logical for SME2 to be more proactive in opting for flood protection measures than SME1. This could be explained given that the large business size predisposes them to have access to higher resources, and greater capacity to identify and address the risk of flooding. Several studies have shown that vulnerability to flood risk is strongly linked with the size of businesses, where smaller businesses are more vulnerable to flood risk (Crichton, 2006; Kreibich et al., 2007; Sullivan-Taylor & Branicki (2011).

There is a wide range of barriers (Perception, experience and perspective of the owner) that can be identified as factors influencing the resilience of SMEs to flood risk. Perception and experience of the owner act as a coping capacity, which plays a crucial role in driving the decision-making process related to flood risk (Norrington & Underwood, 2008). The small size of the business is strongly linked with vulnerability (Crichton, 2006). For example, both SME1 and SME2 have a high vulnerability profile to flood risk, due to the small size of their businesses. Thus, support organizations will be required to initiate a major shift in SME thinking and decision-making. It is recommended that flood risk awareness of small businesses is an important strategy to improve flood preparedness in SMEs. For example, support organizations need to draw upon the past flood experiences of SMEs more effectively, in formulating emergency plans and risk mapping, which also has to be updated regularly. Such a standard system can be utilized in improving the risk awareness of SMEs *via* training programs or local knowledge sharing programs (Directors, 2003).

As discussed above, analysis of the questionnaire surveys and the two in-depth case studies pointed out that the resilience of SMEs can be seen as the collective effect of their vulnerability, coping strategies, and coping capacity. Therefore, the conceptual framework primarily improves the understanding and awareness of resilience among SMEs. Afterward, it allows SMEs to identify and take action in order to move forward in enhancing their resilience against flood risk. This is particularly important since scientists identify an increase of these events, because of climate change, in the near future. Adopting adaptive measures is central to resilience and vulnerability reduction.

### **5.5 Limitations of the Study**

Although the research has met its objectives and a rigorous research process was adopted throughout the study, there were certain unavoidable limitations.

The findings presented in this study based on a small sample of SMEs (for the questionnaire survey,  $n=10$ ) due to resource and time constraints. Small sample sizes can generalize difficulty and affect the validity of the results (Kelley et al., 2003). Therefore, it was difficult to find significant relationships from the data, and the ability to replicate the issue identified across the broad SME sector is limited. However, this limitation was mediated by conducting two in-depth case studies, as sample sizes required for qualitative research, such as focus group and interviews, is smaller than what is obligatory for a quantitative approach (Kelley et al., 2003). Thus, the findings from the literature review, questionnaire surveys, and semi-structured interviews adequately addressed the objectives of this study and were adequately developed to elicit information from a range of SMEs representing different industry sectors.

Also, response bias from survey respondents and semi-interviewers is caused by an inability to answer questions correctly. This can be caused by participant recall bias (as the flood events happened in 2009 and 2011) and a long period since the flood events. In order to avoid bias response, it is important to keep survey questions short and clear. Respondents are less likely to answer if a question is too long or if they do not understand the question (Directors, 2003). In addition, conducting surveys should keep the time frame or sample time short. This is because respondents are more likely to recall recent events (Kelley et al., 2003).

## 5.6 Implications for Future Research

The aim of this study was to gain an understanding of the resilience of SMEs to flood risk, and the impacts the SMEs were affected by after such events. The research proposes the following further work to ensure that the key findings of this research are made of value to the SMEs.

An assessment of risk awareness from an individual's perspective is important to understand SMEs' perceptions of flooding. A range of other factors influence the decisions related to implementing flood resistance and resilience will also. Therefore, further findings regarding the perceptions of SMEs could help the businesses' preparedness against future flooding events.

Limitations in funding and human resources often hamper the resilience of SMEs to flood risk. In addition, the absence of BCP could be due to the constrained opportunities to learn and could affect improving business continuity. Hence, further research is needed to explore the various challenges and constraints linked to supporting and delivering training or flood resilience programs for SMEs.

The present study primarily concentrated on the impacts of flooding with regard to tangible and priced damages consequent to direct and indirect impacts. Therefore, further research needs to study in detail intangible and unpriced damages consequent to direct and indirect impacts such as societal and psychological disruptions. This would help develop a deeper understanding of vulnerability and resilience for businesses, including SMEs.

Lastly, more studies are needed to understand the types of support that are required to build the resilience of SMEs and to ensure business continuity against flooding risk, particularly in countries such as Thailand.

## 5.7 Summary

Flooding in Thailand may have devastating impacts that are particularly significant for SMEs. Furthermore, the occurrence of floods and related effects are likely to be even more significant at the local and national level, as such hazards are predicted to further increase in the future due to the impacts of climate change (IPCC, 2014). Flooding may cause a wide range of effects on SMEs and thereby affect the business continuity – especially of SMEs that are less likely to be prepared to deal with such a hazard. However, implementation of coping strategies, such as BCP and property flood protection measures, can counteract the effects of floods on SMEs that are incurred due to business vulnerability, and enhance their ability to limit the flood risk.

The level of resilience the SMEs can achieve against the negative impacts of flooding will depend on their vulnerability pre-disaster, the coping strategies developed, and their inherent coping capacity (Wedawatta & Ingirige, 2016). The present research investigated these issues focusing on Ayutthaya province in Thailand as a case study. Ayutthaya province has experienced increased flooding the most recent being in 2011, which resulted in particularly catastrophic consequences to the local economy. The landscape of this province predisposes it to a very high risk of future flooding.

Findings from this study revealed that SMEs are likely to experience a range of impacts of flooding. Essentially, the indirect impacts of flooding, such as product and service disruptions, travel difficulties for customers, and staff and supply chain disruptions, were relatively higher than the direct impacts. In addition, the survey revealed that the SMEs with previous flooding experience had low levels of coping strategies. Most SMEs depended predominately on property-level flood protection measures, although the implementation of generic business strategies such as the BCP, insurance, and emergency plan, were also found minimally.

Overall, it is important that organizational resilience and the integration of factors such as vulnerability, coping strategies, and coping capacity is enhanced. Coping measures should not be a single measure and need to encompass a broad range of measures such as property-level protection measures and generic business strategies. Representing business continuity/risk management and property-level protection measures play a significant role in reducing the vulnerability of flood risk. This is because the risk of flooding is predicted to further increase in future due to climate change. The focus of

this study was to provide the background for further studies in implementing protection measures for SMEs, and in identifying the main drivers and key challenges for enhancing their ability to handle flood risk.

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## APPENDICES

### Appendix A: Close-ended questionnaire and Interview guideline questions

#### Understanding the Resilience of Small and Medium-Scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk

##### Questionnaire for Small businesses

Hello:

You are invited to participate in our survey [Understanding the resilience of small and medium-scale enterprises (SMEs) in Ayutthaya, Thailand to flood risk. In this survey, approximately 10 Small businesses will be asked to complete a survey that asks questions about how their business can improve resilience to flood risk. It will take approximately 30-45 minutes to complete the questionnaire.

Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point. It is very important for us to learn your opinions.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential. If you have questions at any time about the survey or the procedures, you may contact [Boonyarit Saengnakon] at [+64 220 882 183] or by email at the email address specified below.

Thank you very much for your time and support.

##### General Information

1. Which of the following best describes the industry sector in which your business operates?
  - ☐ Food and Beverages
  - ☐ Rubber and Plastic Products
  - ☐ Metal Products
  - ☐ Machinery and Electrical Appliances
  - ☐ Television and Communication Equipment
  - ☐ Transportation and Communication
  - ☐ Hotels and Restaurants
  - ☐ Other (Please specify) \_\_\_\_\_
2. How many people are employed by your organisation?
  - ☐ 0 (Sole Trader)
  - ☐ 1-5
  - ☐ 6-15
  - ☐ 26-30
  - ☐ 31-50
  - ☐ 51-200



3. What is the annual turnover of your business (approximately)?

- ☐ Less than ₦ 999,000
- ☐ ₦ 1,000,000 – 9,999,000
- ☐ ₦ 10,000,000 –30,000,000
- ☐ More than ₦ 50,000,000

4. Regarding your business premises, do you?

- ☐ Own freehold premises
- ☐ Rent premises
- ☐ Lease premises
- ☐ Work from home
- ☐ Other (Please specify) \_\_\_\_\_

5. Ownership model:

- ☐ Sole Trader
- ☐ Family business
- ☐ Board of Owners
- ☐ Part of a franchise
- ☐ Others (Please specify) \_\_\_\_\_

#### Past experience of flooding events

6. Please indicate the year in which flooding affected your business (Indicate more than one year if applicable. E.g. 2009, 2011).

If your business was not affected/Influenced by any floods, please go to question number 9.

7. What were the effects experienced by your business due to the above flooding event? (please indicate all that are applicable)

- ☐ Not affected
- ☐ Direct damage to property
- ☐ Production process/Service disruption
- ☐ Product distribution disruptions
- ☐ Supply chain disruptions
- ☐ Staff working conditions adversely affected
- ☐ Staff affected by transport disruptions
- ☐ Customers affected by transport disruptions
- ☐ Changes in customer behaviour
- ☐ Increased the cost of insurance
- ☐ Increased cost of input resources
- ☐ Change in government regulations
- ☐ Other (Please specify) \_\_\_\_\_

8. If you received any assistance/ support, from where did you receive such assistance/ support? (please indicate all that are applicable)

- ☐ Family
- ☐ Insurance company
- ☐ Local authority
- ☐ Local utility companies
- ☐ Trade association or other business network
- ☐ Neighbouring business
- ☐ Emergency service
- ☐ Central government
- ☐ Supply chain member/customers
- ☐ Neighbouring households
- ☐ Other (Please specify) \_\_\_\_\_

### Resilient to flooding events

9. What are the steps that you have already taken to protect your business against the effects of flooding events (please select all that are applicable)?

- ☐ Obtain property insurance
- ☐ Obtaining business interruption insurance
- ☐ Developing a business continuity plan
- ☐ Install flood defences
- ☐ Premises improvements
- ☐ Planning your supply chain to minimise disruptions
- ☐ Stock/ equipment relocation
- ☐ Relocation of your business premises
- ☐ Backing up your business data in another location
- ☐ Developing a flood plan
- ☐ Sign up with a flood warning system
- ☐ No step has been taken up to now
- ☐ Other (Please specify) \_\_\_\_\_

10. What are steps that you may consider taking to protect your business against the effects of future flooding events (please select all that are applicable)?

- ☐ Obtain property insurance
- ☐ Obtaining business interruption insurance
- ☐ Developing a business continuity plan
- ☐ Install flood defences
- ☐ Premises improvements
- ☐ Planning your supply chain to minimise disruptions
- ☐ Stock/ equipment relocation
- ☐ Relocation of your business premises
- ☐ Backing up your business data in another location
- ☐ Developing a flood plan
- ☐ Sign up with a flood warning system
- ☐ No step has been taken up to now

☐ Other (Please specify) \_\_\_\_\_

11. If a flooding event 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?

- ☐ Family
- ☐ Insurance company
- ☐ Local authority
- ☐ Local utility companies
- ☐ Trade association or other business network
- ☐ Neighbouring business
- ☐ Emergency service
- ☐ Central government
- ☐ Supply chain member/customers
- ☐ Neighbouring households
- ☐ Other \_\_\_\_\_

12. What assistance/Support do you expect to receive in order to recover from its effects and continue your business as usual?

- ☐ Cleaning and restoration of premises
- ☐ Business continuity advise
- ☐ Provider alternative / temporary business premises
- ☐ Financial assistance
- ☐ Legal advice
- ☐ Advise on suitable coping measures
- ☐ Other (Do you have any other comments to make?)  
\_\_\_\_\_

### Future involvement and comments

13. Please select from the following options if you would like;

- ☐ To receive more information about the study
- ☐ To receive findings and results of the study

14. Would you like participate in a semi-structured interview?

- ☐ Yes
- ☐ No

### Thank you

The researcher wishes to thank you for your kind cooperation to make this research study a success. If you require further information or any clarification, please contact the researcher or supervisors via following contact details;

Boonyarit Saengnakhon Master Research Student Emergency Management Auckland University of Technology +64 220882180 Cometo_msf@hotmail.com	Dr. Eve Coles Research Supervisor Department of Emergency Management Auckland university of Technology +64 921 9999 ext 7499 ecoles@aut.ac.nz	Dr. Rhoda Scherma School of Public Health & Psychosocial Studies Auckland university of Technology +64 921 9999 ext 7228 Rhoda.scherma@aut.ac.nz
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## Understanding the Resilience of Small and Medium-Scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk

### แบบสอบถามสำหรับ องค์กรธุรกิจ ขนาดเล็ก และขนาดกลาง

สวัสดีครับ

ท่านได้ถูกรับเชิญในการเข้าร่วมตอบแบบสำรวจในการวิจัย เรื่อง กรณีศึกษาความเข้าใจของกลุ่มองค์กรธุรกิจขนาดเล็ก และขนาดกลางในจังหวัดอยุธยาในการปรับตัวต่อภัยน้ำท่วม ในการตอบแบบสำรวจในครั้งนี้ มีจำนวนองค์กรธุรกิจ ขนาดเล็ก และ ขนาดกลาง จำนวน 10 องค์กรที่ได้รับคัดเลือกในการตอบแบบสำรวจ การตอบแบบสำรวจใช้เวลา 30-45 นาที

การตอบแบบสำรวจในครั้งนี้ เป็นความสมัครใจของท่านเอง ท่านสามารถยกเลิกการตอบแบบสอบถามได้ทุกเมื่อ ซึ่งข้อมูลที่ท่านแสดงความคิดเห็นจะไม่ถูกเปิดเผยต่อสาธารณชน

หากมีข้อสงสัย ติดต่อสอบถามผู้ทำวิจัย หรือ อาจารย์ที่ปรึกษาตามที่อยู่ด้านล่าง

### ข้อมูลทั่วไป

15. องค์กรของท่านจัดอยู่ในกลุ่มธุรกิจประเภทใด?

- ☐ อาหาร และเครื่องดื่ม
- ☐ พลาสติก และ กลุ่มผลิตภัณฑ์ ยางพลาสติก
- ☐ ผลิตภัณฑ์ โลหะ
- ☐ เครื่องจักร และเครื่องใช้ไฟฟ้า
- ☐ อุปกรณ์ทีวี และ เครื่องมือสื่อสาร
- ☐ การขนส่ง และยานพาหนะ
- ☐ โรงแรม ร้านอาหาร
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

16. จำนวนพนักงาน หรือ ลูกจ้างในองค์กรของท่าน?

- ☐ 0 (Sole Trader)
- ☐ 1-5
- ☐ 6-15
- ☐ 26-30
- ☐ 31-50
- ☐ 51-200

17. ประมาณรายได้ต่อปี?

- ☐ น้อยกว่า 999,000 บาท
- ☐ 1,000,000 – 9,999,000 บาท
- ☐ 10,000,000 – 30,000,000 บาท
- ☐ มากกว่า 50,000,000

18. ลักษณะสถานประกอบการหรือ อาคารประกอบธุรกิจ?

- ☐ เป็นเจ้าของสถานประกอบการ
- ☐ เช่า
- ☐ เช้ง
- ☐ ทำงานจากบ้าน
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

19. ลักษณะองค์กร:

- ☐ ธุรกิจแบบเจ้าของคนเดียว
- ☐ ธุรกิจแบบครอบครัว
- ☐ ธุรกิจแบบคณะกรรมการ

- ☐ หุ่นส่วนเฟรนไชน์
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

### ประสบการณ์ต่อกภัยน้ำท่วมต่อองค์กรของท่าน

20. โปรดระบุปี พ.ศ.ที่ท่านได้รับผลจากน้ำท่วม (เช่น น้ำท่วมใหญ่ พ.ศ. 2554, พ.ศ.2556) ท่านสามารถระบุปีที่ท่านได้รับน้ำท่วมได้มากกว่าหนึ่งครั้ง

\*\*\*หากธุรกิจของท่านไม่เคยถูกน้ำท่วมเลย ข้ามไปยังข้อที่ 9.

21. ผลกระทบจากน้ำท่วมครั้งที่ผ่านมา องค์กรของท่านได้รับผลกระทบอะไรบ้าง (ระบุได้มากกว่าหนึ่งข้อ)

- ☐ ไม่ได้รับผลกระทบ
- ☐ อาคาร ตึก สิ่งก่อสร้างได้รับความเสียหาย
- ☐ ผลกระทบต่อการผลิต หรือ บริการ
- ☐ ผลกระทบต่อการกระจาย ส่งสินค้า
- ☐ ผลกระทบต่อ ชีพพลายเออร์
- ☐ ผลกระทบต่อการการทำงานของลูกจ้าง
- ☐ ผลกระทบต่อการเดินทางมาทำงานของลูกจ้าง
- ☐ ผลกระทบจากการเดินทางของลูกค้า
- ☐ ทำให้มีการเปลี่ยนแปลงพฤติกรรมของลูกค้า
- ☐ ทำให้เพิ่มค่าประกันภัย
- ☐ ทำให้เพิ่มค่าใช้จ่ายต่างๆมากขึ้น
- ☐ ต้องปรับเปลี่ยนตามนโยบายของรัฐ
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

22. หากท่านได้รับความช่วยเหลือผลจากน้ำท่วมครั้งที่ผ่านมา ท่านได้รับความช่วยเหลือจากแหล่งใด (ระบุได้มากกว่าหนึ่งข้อ)

- ☐ คนในครอบครัว/ญาติ
- ☐ บริษัทประกันภัย
- ☐ องค์กรท้องถิ่น
- ☐ บริษัทต่างๆในท้องถิ่น
- ☐ องค์กร และเครือข่ายที่เกี่ยวข้องกับองค์กรของท่าน
- ☐ บริษัทเพื่อนบ้าน
- ☐ หน่วยงานช่วยเหลือเงิน
- ☐ องค์กรจากรัฐ
- ☐ สมาชิกชีพพลายเออร์ หรือ ลูกค้า
- ☐ เพื่อนบ้าน
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

### การเตรียมตัวต่อกภัยน้ำท่วม

23. โปรดระบุ มาตรการที่ท่านได้ดำเนินการ หรือจัดการแก้ไขเพื่อป้องกันผลกระทบต่อน้ำท่วมแล้ว (ระบุได้มากกว่าหนึ่งข้อ)

- ☐ ซื้อ หรือ เพิ่มประกันภัย
- ☐ ซื้อประกันธุรกิจ
- ☐ เริ่มใช้แผนพัฒนาธุรกิจ (Business Continuity)

- ☐ ติดตั้งกำแพงป้องกันน้ำ
- ☐ ต่อเติม ปรับแต่ง ยกพื้นระดับ สถานประกอบการ ในป้องกันน้ำท่วม
- ☐ สร้างแผนลดผลกระทบต่อ ชีพพลายเออร์
- ☐ ย้ายที่เกียสต็อค/ อุปกรณ์
- ☐ ย้ายสถานประกอบการ
- ☐ ย้ายเก็บฐานข้อมูล เอกสารไปแหล่งอื่น
- ☐ สร้างแผนป้องกันน้ำท่วม
- ☐ เข้าร่วมโครงการ ระบบแจ้งเตือนภัยน้ำท่วม
- ☐ ไม่มีมาตรการใดๆ ณ เวลานี้
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

24. โปรดระบุ มาตรการใด ที่ท่านพิจารณาที่จะสร้างหรือพัฒนา เพื่อป้องกันภัยน้ำท่วม ในอนาคต (ระบุได้มากกว่าหนึ่งข้อ)

- ☐ ซื่อ หรือ เพิ่มประกันภัย
- ☐ ซื่อประกันธุรกิจ
- ☐ เริ่มใช้แผนพัฒนาธุรกิจ (Business Continuity)
- ☐ ติดตั้งกำแพงป้องกันน้ำ
- ☐ ต่อเติม ปรับแต่ง ยกพื้นระดับ สถานประกอบการ ในป้องกันน้ำท่วม
- ☐ สร้างแผนลดผลกระทบต่อ ชีพพลายเออร์
- ☐ ย้ายที่เกียสต็อค/ อุปกรณ์
- ☐ ย้ายสถานประกอบการ
- ☐ ย้ายเก็บฐานข้อมูล เอกสารไปแหล่งอื่น
- ☐ สร้างแผนป้องกันน้ำท่วม
- ☐ เข้าร่วมโครงการ ระบบแจ้งเตือนภัยน้ำท่วม
- ☐ ไม่มีมาตรการใดๆ ณ เวลานี้
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

25. หากมีภัยน้ำท่วมในอนาคต แหล่งการช่วยเหลือใดที่ท่านคิดว่าต้องการช่วยเหลือมากที่สุด

- ☐ คนในครอบครัว/ญาติ
- ☐ บริษัทประกันภัย
- ☐ องค์กรท้องถิ่น
- ☐ บริษัทต่างๆในท้องถิ่น
- ☐ องค์กร และเครือข่ายที่เกี่ยวข้องกับองค์กรของท่าน
- ☐ บริษัทเพื่อนบ้าน
- ☐ หน่วยงานช่วยเหลือเงิน
- ☐ องค์กรจากรัฐ
- ☐ สมาชิกชีพพลายเออร์ หรือ ลูกค้า
- ☐ เพื่อนบ้าน
- ☐ อื่นๆ (โปรดระบุ) \_\_\_\_\_

26. การช่วยเหลือแหล่งใดที่ท่านคาดหวังมากที่สุด เพื่อจะช่วยเหลือหรือบรรเทาจากผลกระทบจากภัยน้ำท่วมในอนาคต

- ☐ การซ่อมแซม ทำความสะอาดของอาคาร สถานประกอบการ
- ☐ คำแนะนำ การอบรม แผนพัฒนาธุรกิจ (Business Continuity)
- ☐ แหล่งสถานที่ หรือ สถานประกอบการชั่วคราว
- ☐ การช่วยเหลือทางการเงิน
- ☐ คำแนะนำทางกฎหมาย

- ☐ คำแนะนำ การอบรม มาตรการป้องกันน้ำท่วม
- ☐ อื่นๆ (โปรดระบุ)\_\_\_\_\_

27. ท่านมีข้อเสนอแนะ หรือความคิดเห็นที่จะเสนอหรือไม่ โปรดระบุ?

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#### การเข้าร่วมในอนาคต

28. โปรดระบุ ความต้องการจากการเข้าร่วมการวิจัยในครั้งนี้

- ☐ ต้องการข้อมูลเพิ่มเติม
- ☐ ต้องการผลสรุปจากการวิจัย
- ☐ ไม่ต้องการ

29. ท่านมีความยินดีจะให้การสัมภาษณ์ลงรายละเอียดข้อมูลเพิ่มเติมหรือไม่?

- ☐ ใช่
- ☐ ไม่

#### ขอขอบพระคุณในความร่วมมือ

หากต้องการข้อมูล หรือเสนอแนะกรุณาติดต่อด้านล่าง

#### Semi-structure interview guidelines for SMEs

Boonyarit Saengnakhon Master Research Student Emergency Management Auckland University of Technology +64 220882180 Cometo_msf@hotmail.com	Dr. Eve Coles Research Supervisor Department of Emergency Management Auckland university of Technology +64 921 9999 ext 7499 ecoless@aut.ac.nz	Dr. Rhoda Scherma School of Public Health & Psychosocial Studies Auckland university of Technology +64 921 9999 ext 7228 Rhoda.scherma@aut.ac.nz
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## Understanding the Resilience of Small and Medium-Scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk.

1. สถานประกอบการของท่านเคยได้รับน้ำท่วมหรือไม่
  - 1.1 ถ้าใช่ กรุณาให้รายละเอียดเป็นการบอกเล่าตามคำถามด้านล่างนี้ ช่วยเขียนเป็นเรื่องราว เหมือนเล่าเรื่อง
  - 1.2 ผลกระทบที่เกิดขึ้นต่อธุรกิจมีด้านไหนบ้าง ช่วยอธิบายเพิ่มเติม
2. ท่านคิดว่าน้ำท่วมเป็นภาวะเสี่ยงของทุกๆปีต่อการดำเนินกิจการของท่าน อย่างไร
3. มาตรการที่ท่านได้ดำเนินการ หรือจัดการแก้ไขเพื่อป้องกันผลกระทบต่อน้ำท่วมแล้ว ช่วยอธิบายเป็นบ้านเรื่องราว เช่น ซื้อประกันภัยน้ำท่วม จากบริษัท ราคาคุ้มค่ากับการประกัน หรือ ต่อเติมบ้าน ปลั๊กไฟ ติดตั้งสูงขึ้น บ้านมีกระสอบทรายไว้หรือไม่ ถมที่เพิ่ม สร้างกำแพง ติดต่อวางแผนกับชลประทานเพิ่ม
4. ท่านคิดว่าธุรกิจของท่านมีมาตรการเพียงพอต่อการป้องกันน้ำท่วมหรือยัง กรุณาอธิบาย? จุดแข็งที่ท่านคิดว่าธุรกิจของท่านพร้อมรับมือจากน้ำท่วม แล้วสามารถฟื้นตัวได้อย่างรวดเร็ว จดอ่อนที่ท่านคิดว่าธุรกิจของท่านไม่สามารถจัดการได้ เช่น ประกันราคาแพง ไม่คุ้ม
5. องค์กร หรือ หน่วยงาน หรือ ระบบ อะไรที่ท่านคิดว่าจะช่วยให้ท่านกลับมาทำธุรกิจได้เร็ว ขึ้นหลังน้ำท่วมในอนาคต เช่น รัฐมีกองทุนช่วยเหลือการเงิน การให้ความรู้ แผนพัฒนาธุรกิจ จากภาครัฐ หรือหน่วยงานที่เกี่ยวข้อง หรือมาตรการต่างของภาครัฐในการป้องกันน้ำท่วม
6. ท่านวิธีการใด จะช่วยในการป้องกันน้ำท่วมแบบยั่งยืน?

### Thank you

The researcher wishes to thank you for your kind cooperation to make this research study a success. If you require further information or any clarification, please contact the researcher or supervisors via following contact details;

Boonyarit Saengnakhon Master Research Student Emergency Management Auckland University of Technology +64 220882180 Cometo_msf@hotmail.com	Dr. Eve Coles Research Supervisor Department of Emergency Management Auckland university of Technology +64 921 9999 ext 7499 ecoless@aut.ac.nz	Dr. Rhoda Scherma School of Public Health & Psychosocial Studies Auckland university of Technology +64 921 9999 ext 7228 Rhoda.scherma@aut.ac.nz
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**Appendix B: Ethic approval (AUTEC)**

11 March 2016

Eve Coles

Faculty of Health and Environmental Sciences

Dear Eve

Re Ethics Application: **16/48 Understanding the resilience of small and medium-scale enterprises (SMEs) in Ayutthaya, Thailand to flood risk.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 11 March 2019.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through <http://www.aut.ac.nz/researchethics>. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 11 March 2019;
- A brief report on the status of the project using form EA3, which is available online through <http://www.aut.ac.nz/researchethics>. This report is to be submitted either when the approval expires on 11 March 2019 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this. If your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply there.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz).

All the very best with your research,



Kate O'Connor

Executive Secretary

**Auckland University of Technology Ethics Committee**

Cc: Boonyarit Saengnakon cometo\_msf@hotmail.com, Chris Webb, Rhoda Scherman

## **Appendix C: Participant Information sheet (Questionnaire survey)**

### **Participant Information Sheet (Questionnaire survey)**

#### **Date Information Sheet Produced:**

29 February 2016

#### **Project Title: Understanding the Resilience of Small and Medium-scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk**

### **An Invitation**

Hello.

My name is Boonyarit Saengnakhon, and I am embarking on this research project as part of my Master dissertation. Following your completion of the questionnaire survey, you are invited to take part in the first part of the study, a study on Understanding Resilience of Small and Medium-scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk. Whether or not you take part is your choice. If you don't want to take part, you don't have to give a reason. If you do want to take part now, but change your mind later, you can pull out of the study at any time.

This Participant Information Sheet will help you decide if you'd like to take part. It sets out why we are doing the study, what your participation would involve, what the benefits and risks to you might be, and what would happen after the study ends.

We will go through this information with you and answer any questions you may have. You do not have to decide today whether or not you will participate in this study. Before you decide, you may want to talk about the study with other people. Feel free to do this.

What is the purpose of this research?

This study is part of my final year dissertation for my Masters Degree in Emergency Management, at the Auckland University of Technology. It is hoped that the study could provide useful information for government and related official agencies, about advice and recommendations given to various Small and Medium Enterprise (SMEs) which can improve their resilience to flood risk.

How was I identified and why am I being invited to participate in this research?

The researcher may have to recruit the respondents, by going from door-to-door, or You may have been invited to this study either through the director of Sub-District Administrative Organisations (SAOs) or through the village leader in your area. Alternatively, it is possible a friend or colleague may have asked whether you would be happy for me to contact you. You have been invited to participate in this study because you meet the criteria for the initial questionnaire survey.

What will happen in this research?

I would like to invite you to participate in this survey [Understanding the resilience of small and medium-scale enterprises (SMEs) in Ayutthaya, Thailand to flood risk. In

this survey, approximately 10 Small businesses will be asked to complete a survey that asks questions about how their business can improve resilience to flood risk. The survey will last between 30-45 minutes and will be more like an informal discussion.

What are the discomforts and risks?

While you may be asked to answer questions on how your organisation can improve resilience to flood risk, all information provided by you will be kept confidential all the time. All responses to all questions and information provided by you will be anonymised. For example, no personal details related to you / your organisation or where your location is, will be recorded anywhere. Only the researcher supervisors will have access to the information you provide to me. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point.

How will these discomforts and risks be alleviated?

If you have any a concern about any aspect of this study, you should ask to speak to the researcher who will do their best to answer your questions. Also, if you remain unhappy and wish to complain formally you can do this through the research supervisor or the Executive Secretary of AUTECH. In addition, if you wish to withdraw from the study, all the information and data collected from you, to date, will be destroyed, and your name removed from all the study files. There will be a process in place in case there are any signs of distress while participants are discussing their experiences with flooding. The researcher will initially offer them a break, ask if they would like to continue with the research, and offer a list of support or counselling services, for example, mental health hotline 1667 or 1323 (Toll free calls).

What are the benefits?

Although there may not be any immediate benefit of your participation in this research, the stories you share will be contributing to the body of knowledge about the SMEs' resilience to flood risk. This may contribute to a better understanding by professionals and individuals, who are involved in some aspect of government and disaster preparedness planning. It may also contribute to the development of more appropriate interventions for SMEs and private organisations that take into account some of these challenges. Also, the primary researcher will be able to fulfil the requirement for the Masters degree at Auckland University of Technology.

How will my privacy be protected?

All information you provide in this study will be kept confidential. All completed consent forms and written survey forms will be sealed in an envelope and locked in a cabinet in a hotel's safe (during the research) and in the primary researcher's AUT office afterwards. No name and address will be sought through which people can identify who she/he was. The participants also will be informed of the importance of not discussing 'who said what' with anyone. Under no circumstances will identifiable responses be provided to any other third party. Information emanating from the evaluation will only be made public in a completely un-attributable format, or at the aggregate level in order to ensure that no participant will be identified. I must however inform you that, if you disclose information that may result in you or anyone else being put at risk of harm, we may have to inform the appropriate authorities.

### What are the costs of participating in this research?

This study will be paid for by research grant money applied for by the scholarship. There is no direct cost to you in participating. There will be no payment for taking part in the initial survey. If you are invited to participate in this research component of the study, once you complete the interview you will receive a thank you gift as a token, in recognition of the time and inconvenience in participating.

### What opportunity do I have to consider this invitation?

As a SME organization, you are in an ideal position to give us valuable first-hand information from your own perspective. The questionnaire survey takes around 30-45 minutes and is very informal. I am simply trying to capture your thoughts and perspectives on being a SME organization. However, your participation will be a valuable addition to our research, and findings could lead to greater public understanding of how SMEs can improve their resilience to flood risk and the people in the field

### How do I agree to participate in this research?

If you are happy to participate in the research, I will ask you to read this information sheet, sign the consent form and return it to me. When I receive this, I will contact you to discuss your participation in the evaluation. At this point, I can confirm your participation and make arrangement for you to conduct a questionnaire survey.

### Will I receive feedback on the results of this research?

You will have the opportunity to view and approve the data I gather from you prior to the completion of the study. You will have access to my completed dissertation. If you indicate, on the consent form, that you wish to receive a copy of the summary research report, then this will be sent to you on completion of my dissertation.

### What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Eve Coles*, [ecoles@aut.ac.nz](mailto:ecoles@aut.ac.nz), (+64) 921 9999 ext 7499

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEK, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 921 9999 ext 6038.

### Who do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

#### **Researcher Contact Details:**

Boonayrit Saengnakhon, [cometo\\_msf@hotmail.com](mailto:cometo_msf@hotmail.com), (+64) 220 882 183

#### **Project Supervisor Contact Details:**

Eve Coles, [ecoles@aut.ac.nz](mailto:ecoles@aut.ac.nz), (+64) 921 9999 ext 7499

Department of Emergency Management, School of Public Health and Psychosocial Studies, Faculty of Health and Environment Sciences

Approved by the Auckland University of Technology Ethics Committee on **March 11, 2016**, AUTC Reference number **16/48**.

### ข้อมูลการวิจัยเบื้องต้น (Participant Information Sheet)

วัน ปี/เดือน/ 29 กุมภาพันธ์ 2559

**ชื่อโครงการวิจัย** การศึกษาความเข้าใจของกลุ่มองค์กรธุรกิจขนาดเล็กในจังหวัดอยุธยา ในการปรับตัวต่อกฎน้ำท่วม

#### คำกล่าวเบื้องต้น

สวัสดีครับผมนายบุญฤทธิ์ แสงนคร ซึ่งเป็นนักศึกษานิเทศศาสตร์ ได้จัดทำโครงการวิจัย ซึ่งเป็น ส่วนหนึ่งของรายวิชาการวิจัย ประจำปี 2559 ในหัวข้องานวิจัย การศึกษา ความเข้าใจของกลุ่มองค์กรธุรกิจ ขนาดเล็กในจังหวัดอยุธยา การปรับตัวต่อกฎน้ำท่วม ในการเข้าร่วมการสำรวจแบบสอบถามในครั้งนี้ เป็นการเข้าร่วม ด้วยความสมัครใจด้วยตัวของท่านเอง ถ้าหากท่านไม่สมัครใจเข้าร่วม ถือได้ว่าเป็นสิทธิที่ท่านสามารถปฏิเสธ โดยไม่ต้องให้เหตุผลใดๆในการเข้าร่วมโครงการวิจัยในครั้งนี้.

ข้อมูลการวิจัยเบื้องต้น (Participant Information Sheet) จะเป็นข้อมูลเบื้องต้น สำหรับในการใช้ตัดสินใจร่วมในโครงการวิจัยในครั้งนี้ ซึ่งข้อมูลจะประกอบไปด้วยข้อมูลเบื้องต้น วัตถุประสงค์ของโครงการวิจัย ผลประโยชน์ และภาวะเสี่ยง และขั้นตอน กระบวนการวิจัย จากตอนต้น จนถึงสิ้นสุดกระบวนการวิจัย

หากมีข้อมูลซักถามในข้อมูลขอให้ท่านได้ซักถามได้ทันที

#### วัตถุประสงค์ของโครงการวิจัย

เป็นส่วนหนึ่งของรายวิชา งานวิจัย คณะ การจัดการภัยพิบัติ การจัดการภาวะฉุกเฉิน (Emergency management) มหาวิทยาลัย Auckland University Of Technology ประเทศนิวซีแลนด์ ซึ่งการวิจัยนี้ หวังว่าจะได้ค้นคว้าและทำความเข้าใจของกลุ่มองค์กรธุรกิจขนาดเล็กในจังหวัดอยุธยา ในการปรับตัวต่อกฎน้ำท่วม

#### ทำไมท่านถึงได้รับเลือกในการเข้าร่วมโครงการวิจัยในครั้งนี้

การรับเชิญเข้าร่วมในโครงการวิจัย มีได้หลายช่องทาง เช่น ทางเจ้าหน้าที่ ผู้ใหญ่บ้าน หรือ เพื่อน ผู้ร่วมงาน ซึ่งการได้รับเชิญในครั้งนี้เนื่องจากองค์กรของท่านได้เข้าตามหลักเกณฑ์ของการวิจัยในครั้งนี้

#### จะมีขั้นตอนอะไรบ้างหากเข้าร่วมในโครงการวิจัยในครั้งนี้

ท่านจะได้รับเชิญสัมภาษณ์ ประสานงานจากการจัดการภัยน้ำท่วม ซึ่งจะใช้เวลาประมาณ 30-45 นาที สำหรับ การให้ข้อมูล ซึ่งเรื่องสถานที่ และเวลา ขึ้นกับว่าท่านจะเป็นผู้ตกลงตามความสะดวกของท่าน อาจจะมีการอัดบันทึกเสียง หลังจากให้ข้อมูลจะเปิดโอกาสให้ท่านได้ตรวจทานข้อมูล และซักถาม หรือ เปลี่ยนแปลง ก่อนมีการเผยแพร่งานวิจัย ซึ่งท่านมีสิทธิในการเปลี่ยนแปลง หรือยุติยกเลิกการให้ข้อมูลได้ทุกเมื่อ

#### หากท่านเข้าร่วมในโครงการในครั้งนี้ จะมีภาวะเสี่ยงหรือ อันตรายหรือไม่

ข้อมูลจากการสัมภาษณ์ในโครงการวิจัยในครั้งนี้ ข้อมูลจะถูกเก็บเป็นความลับ รายละเอียด ของตัวผู้ให้สัมภาษณ์ ชื่อ ที่อยู่ จะไม่ปรากฏในข้อมูล ผู้ที่เข้าถึงข้อมูลใน ครั้งนี้ จะเป็น อาจารย์ ที่ปรึกษา ของ นักศึกษาผู้เป็นเจ้าของในโครงการวิจัยเท่านั้น หากการตอบแบบสอบถามทำให้ท่าน เกิดความไม่พึงพอใจจากประสบการณ์ที่ได้รับจากภัยน้ำท่วมในครั้งก่อน คำแนะนำเบื้องต้นที่ท่านจะได้รับคือหยุดพักการตอบแบบสอบถาม หรือ สัมภาษณ์ หรือให้คำปรึกษาสายด่วนสุขภาพจิต โทร 1667 หรือ 1323

#### หากว่าท่านรู้สึกไม่พึงพอใจ หลังจากการเข้าร่วมงานวิจัยในครั้งนี้ จะยุติการเข้าร่วมในโครงการวิจัยได้อย่างไร

ถ้าหากท่านมีข้อสงสัยจากการเข้าร่วมโครงการวิจัยในครั้งนี้ ท่านสามารถสอบถามได้ทุกครั้ง หรือท่านสามารถติดต่อโดยตรงไปยังอาจารย์ประจำตัวของนักศึกษา หรือ คณะกรรมการจริยธรรมวิจัย ของ มหาวิทยาลัยที่นักศึกษา กำลังศึกษาในขณะนี้ ข้อมูลการติดต่อได้แจ้งไว้ด้านล่างแล้ว

#### ประโยชน์ที่จะก่อเกิดในการให้ข้อมูลในโครงการวิจัยในครั้งนี้

ประสบการณ์จากท่านในการให้ข้อมูลจะถูกบันทึกเป็นเรื่องราว และจะนำข้อมูล ที่ได้มาเป็น องค์ความรู้ ถึงการปรับตัวขององค์กรธุรกิจขนาดเล็กต่อกฎน้ำท่วม

#### ท่านจะได้รับการปกป้องความลับของข้อมูลที่ให้สัมภาษณ์อย่างไร

ข้อมูลจะได้รับการจัดเก็บอย่างเป็นความลับ ซึ่งจะไม่ปรากฏชื่อ ที่อยู่ของผู้ให้สัมภาษณ์ ข้อมูลจะไม่มีการแชร์ข้อมูลไปยังบุคคลที่สาม การเผยแพร่ข้อมูลจะไม่ปรากฏชื่อของท่านต่อสาธารณะ อันนำมา สู่บ่งบอกถึงตัวตนของท่าน หากมีการลักลอบเปิดเผยข้อมูลของท่าน โดยทางเราจะดำเนินการแจ้ง ต่อหน่วยงาน เบื้องต้นต่อไป

#### **ค่าใช้จ่ายในการเข้าร่วมโครงการวิจัยในครั้งนี้**

เนื่องจากโครงการวิจัยในครั้งนี้ได้รับสนับสนุนทุนการศึกษาจากรัฐบาลนิวซีแลนด์ ซึ่ง ผู้ทำวิจัยได้รับคัดเลือกเป็นนักเรียนทุนประจำปี ผู้เข้าร่วมในการตอบแบบสอบถามใน 2557 ชิ้นแรกจะ ไม่มี ค่าตอบแทน หากแต่การร่วมให้การสัมภาษณ์ แบบเชิงลึกจะมีค่าตอบแทนให้

#### **โอกาสที่ท่านจะได้เข้าร่วมให้การสัมภาษณ์แบบเชิงลึก**

ท่านจะได้รับการพิจารณาหลังจากที่ท่านได้ตอบแบบสอบถามข้อมูลเบื้องต้น ซึ่งคุณสมบัติ นั้น ได้พิจารณาจากแบบสอบถามที่ได้มา

#### **ท่านจะตอบตกลงเข้าร่วมโครงการวิจัยอย่างไร เมื่อท่านได้รับคำเชิญเข้าร่วมโครงการวิจัย**

ท่านจะได้รับข้อมูลเบื้องต้นจากโครงการวิจัยในครั้งนี้ และเซ็นใบยินยอม ในการเข้าร่วมใน โครงการวิจัยในครั้งนี้

#### **ท่านจะได้รับผลงานวิจัยในครั้งนี้หรือไม่**

ท่านจะได้อ่าน และ เสนอแนะ เปลี่ยนแปลงข้อมูล ทุกครั้งก่อนการมีการเผยแพร่ข้อมูลสู่สาธารณะ หลังจากการมีการเผยแพร่ทางตีพิมพ์ หากท่านมีความประสงค์ต้องการข้อมูล ผู้วิจัยมีความยินดีที่จะจัด เตรียม ผล งานตามความร้องขอ

#### **ท่านจะอย่างไรหากมีความประสงค์จะร้องเรียน ต่อโครงการวิจัยในครั้งนี้**

ท่านสามารถติดต่อโดยตรงไปยังอาจารย์ที่ปรึกษาของผู้วิจัย ได้ที่ Dr. Eve Coles ติดต่อทางอีเมลล์ [ecoles@aut.ac.nz](mailto:ecoles@aut.ac.nz) เบอร์ติดต่อ 9999 921 (0064)ext 7499

หรือ คณะกรรมการจริยธรรมมหาวิทยาลัย คุณ Kate O'Connor ติดต่อทางอีเมลล์ [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz) เบอร์ติดต่อ (0064) 921 9999 ext 6038

หรือ ที่อยู่ผู้ทำวิจัย บุญญาฤทธิ์ แสงนคร ([cometo\\_msf@hotmail.com](mailto:cometo_msf@hotmail.com)) เบอร์ติดต่อ (0064) 220 882 183

## **Appendix D: Participant Information sheet (Case study)**

### **Participant Information Sheet (Case study)**

#### **Date Information Sheet Produced:**

29 February 2016

#### **Project Title: Understanding the Resilience of Small and Medium-scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk**

#### **An Invitation**

Hello.

My name is Boonyarit Saengnakhon, and I am embarking on this research project as part of my Master dissertation. Following your completion of the questionnaire survey, you are invited to take part in the second part of the study, a study on Understanding Resilience of Small and Medium-scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk. Whether or not you take part is your choice. If you don't want to take part, you don't have to give a reason. If you do want to take part now, but change your mind later, you can pull out of the study at any time.

This Participant Information Sheet will help you decide if you'd like to take part. It sets out why we are doing the study, what your participation would involve, what the benefits and risks to you might be, and what would happen after the study ends.

We will go through this information with you and answer any questions you may have. You do not have to decide today whether or not you will participate in this study. Before you decide, you may want to talk about the study with other people. Feel free to do this.

What is the purpose of this research?

This study is part of my final year dissertation for my Masters Degree in Emergency Management, at the Auckland University of Technology. It is hoped that the study could provide useful information for government and related official agencies, about advice and recommendations given to various Small and Medium Enterprise (SMEs) which can improve their resilience to flood risk.

How was I identified and why am I being invited to participate in this research?

You may have been invited to this study either through the director of Sub-District Administrative Organisations (SAOs) or through the village leader in your area. Alternatively, it is possible a friend or colleague may have asked whether you would be happy for me to contact you. You have been invited to participate in this study because you meet the criteria for the second part of the study.

What will happen in this research?

I would like to interview you and ask you to tell me your story of the experience of improving your resilience to flood risk. The interview will last between 45-60 minutes and will be more like an informal discussion. The interview will take place at a time and place that is convenient to you, and with your consent, will be audio taped. I may need to contact you again after the interview, to clarify some points raised in the interview. Prior to completion of the study, the data I have gathered from you will be returned to you to enable you make changes as you see fit and /or to request the withdrawal of anything you do not wish to be made public.

What are the discomforts and risks?

While you may be asked to answer questions on how your organisation can improve resilience to flood risk, all information provided by you will be kept confidential all the time. All responses to all questions and information provided by you will be anonymised. For example, no personal details related to you / your organisation or where your location is, will be recorded anywhere. Only the researcher supervisors will have access to the information you provide to me. Your participation in this study is completely voluntary. There are no foreseeable risks associated with this project. However, if you feel uncomfortable answering any questions, you can withdraw from the survey at any point.

How will these discomforts and risks be alleviated?

If you have any a concern about any aspect of this study, you should ask to speak to the researcher who will do their best to answer your questions. Also, if you remain unhappy and wish to complain formally you can do this through the research supervisor or the Executive Secretary of AUTECH. In addition, if you wish to withdraw from the study, all the information and data collected from you, to date, will be destroyed, and your name removed from all the study files. There will be a process in place in case there are any signs of distress while participants are discussing their experiences with flooding. The researcher will initially offer them a break, ask if they would like to continue with the research, and offer a list of support or counselling services, for example, mental health hotline 1667 or 1323 (Toll free calls).

What are the benefits?

Although there may not be any immediate benefit of your participation in this research, the stories you share will be contributing to the body of knowledge about the SMEs' resilience to flood risk. This may contribute to a better understanding by professionals and individuals, who are involved in some aspect of government and disaster preparedness planning. It may also contribute to the development of more appropriate interventions for SMEs and private organisations that take into account some of these challenges. Also, the primary researcher will be able to fulfil the requirement for the Masters degree at Auckland University of Technology.

How will my privacy be protected?

All information you provide in this study will be kept confidential. All completed consent forms and written survey forms will be sealed in an envelope and locked in a cabinet in a hotel's safe (during the research) and in the primary researcher's AUT office afterwards. No name and address will be sought through which people can identify who she/he was. The participants also will be informed of the importance of not discussing 'who said what' with anyone. Under no circumstances will identifiable responses be provided to any other third party. Information emanating from the evaluation will only be made public in a completely un-attributable format, or at the aggregate level in order to ensure that no participant will be identified. I must however inform you that, if you disclose information that may result in you or anyone else being put at risk of harm, we may have to inform the appropriate authorities.

What are the costs of participating in this research?

This study will be paid for by research grant money applied for by the scholarship. There is no direct cost to you in participating. There will be no payment for taking part in the initial survey. If you are invited to participate in this research component of the study, once you complete the interview you will receive a thank you gift as a token, in recognition of the time and inconvenience in participating.

What opportunity do I have to consider this invitation?



As a SME organization, you are in an ideal position to give us valuable first-hand information from your own perspective. The interview takes around 60 minutes and is very informal. I am simply trying to capture your thoughts and perspectives on being a SME organization.

However, your participation will be a valuable addition to our research, and findings could lead to greater public understanding of how SMEs can improve their resilience to flood risk and the people in the field

How do I agree to participate in this research?

If you are happy to participate in the research, I will ask you to read this information sheet, sign the consent form and return it to me. When I receive this, I will contact you to discuss your participation in the evaluation. At this point, I can confirm your participation and make arrangement for you to be interviewed.

Will I receive feedback on the results of this research?

You will have the opportunity to view and approve the data I gather from you prior to the completion of the study. You will have access to my completed dissertation. If you indicate, on the consent form, that you wish to receive a copy of the summary research report, then this will be sent to you on completion of my dissertation.

### **What do I do if I have concerns about this research?**

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor, *Eve Coles*, [ecoles@aut.ac.nz](mailto:ecoles@aut.ac.nz), (+64) 921 9999 ext 7499

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTC, Kate O'Connor, [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz), 921 9999 ext 6038.

Who do I contact for further information about this research?

Please keep this Information Sheet and a copy of the Consent Form for your future reference. You are also able to contact the research team as follows:

**Researcher Contact Details:** Boonayrit Saengnakhon, [cometo\\_msf@hotmail.com](mailto:cometo_msf@hotmail.com), (+64) 220 882 183

**Project Supervisor Contact Details:** Eve Coles, [ecoles@aut.ac.nz](mailto:ecoles@aut.ac.nz), (+64) 921 9999 ext 7499

Department of Emergency Management, School of Public Health and Psychosocial Studies, Faculty of Health and Environment Sciences

**Approved by the Auckland University of Technology Ethics Committee on  
March 11, 2016, AUTC Reference number 16/48.**

## ข้อมูลการวิจัยเบื้องต้น (Participant Information Sheet)

วัน ปี/เดือน/ 29กุมภาพันธ์ 2559

**ชื่อโครงการวิจัย** กรณีศึกษาความเข้าใจของกลุ่มองค์กรธุรกิจขนาดเล็กในจังหวัดอยุธยา ในการปรับตัวต่อกฎน้ำท่วม

### คำกล่าวเบื้องต้น

สวัสดีครับผมนายบุญฤทธิ์ แสงนคร ซึ่งเป็นนักศึกษาปริญญาโท ได้จัดทำโครงการวิจัย ซึ่ง เป็น ส่วนหนึ่งของรายวิชาวิจัย ประจำการ หลังจากที่คุณได้รับการทำแบบประเมินเบื้องต้นไปนั้น ใน 2559ส่วน นี้ ท่านจะได้รับเชิญเข้าร่วมสัมภาษณ์แบบเชิงลึก ในหัวข้องานวิจัย กรณีศึกษา ความเข้าใจของกลุ่มองค์กรธุรกิจ ขนาดเล็กในจังหวัดอยุธยา การปรับตัวต่อกฎน้ำท่วม ในการเข้าร่วมการสัมภาษณ์ในครั้งนี้ เป็นการเข้าร่วม ด้วย ความสมัครใจ ด้วยตัวของท่านเอง ถ้าหากท่านไม่สมัครใจเข้าร่วม ถือได้ว่าเป็นสิทธิที่ท่านสามารถปฏิเสธ โดย ไม่ต้องให้เหตุผลใดๆในการเข้าร่วมการในโครงการวิจัยในครั้งนี้.

ข้อมูลการวิจัยเบื้องต้น (Participant Information Sheet) จะเป็นข้อมูลเบื้องต้น สำหรับในการใช้ตัดสินใจร่วม ใน โครงการวิจัยในครั้งนี้ ซึ่งข้อมูลจะประกอบไปด้วยข้อมูลเบื้องต้น วัตถุประสงค์ของโครงการวิจัย ผลประโยชน์ และภาวะเสี่ยง และขั้นตอน กระบวนการวิจัย จากตอนต้น จนถึงสิ้นสุดกระบวนการวิจัย

หากมีข้อสงสัยหรือคำถามในข้อมูลขอให้ท่านได้ซักถามได้ทันที

### วัตถุประสงค์ของโครงการวิจัย

เป็นส่วนหนึ่งของรายวิชา งานวิจัย คณะ การจัดการภัยพิบัติ การจัดการภาวะฉุกเฉิน / (Emergency management) มหาวิทยาลัย Auckland University Of Technology ประเทศนิวซีแลนด์ ซึ่งการวิจัยนี้ หวังว่าจะได้ค้นคว้าและทำความเข้าใจของกลุ่มองค์กรธุรกิจขนาดเล็กในจังหวัดอยุธยา ในการปรับ ตัวต่อกฎน้ำท่วม

### ทำไมท่านถึงได้รับเลือกในการเข้าร่วมโครงการวิจัยในครั้งนี้

การรับเชิญเข้าร่วมในโครงการวิจัย มีได้หลายช่องทาง เช่น ทางเจ้าหน้าที่ ผู้ใหญ่บ้าน หรือ เพื่อนร่วมงาน ซึ่งการได้รับเชิญในครั้งนี้เนื่องจากองค์กรของท่านได้เข้าตามหลักเกณฑ์ของการวิจัยในครั้งนี้

### จะมีขั้นตอนอะไรบ้างหากเข้าร่วมในโครงการวิจัยในครั้งนี้

ท่านจะได้รับเชิญสัมภาษณ์ ประสพการณ์จากการจัดการภัยน้ำท่วม ซึ่งจะใช้เวลาประมาณ 60นาที สำหรับ-45 การให้ข้อมูล ซึ่งเรื่องสถานที่ และเวลา ขึ้นกับว่าท่านจะเป็นผู้ตกลงตามความสะดวกของท่าน อาจจะมีการนัดบันทึกเสียง หลังจากให้ข้อมูลจะเปิดโอกาสให้ท่านได้ตรวจทานข้อมูล และซักถาม หรือ เปลี่ยนแปลง ก่อนมีการเผยแพร่งานวิจัย ซึ่งท่านมีสิทธิในการเปลี่ยนแปลง หรือยุติ ยกเลิกการให้ข้อมูลได้ทุกเมื่อ

### หากท่านเข้าร่วมในโครงการในครั้งนี้ จะมีภาวะเสี่ยงหรือ อันตรายหรือไม่

ข้อมูลจากการสัมภาษณ์ในโครงการวิจัยในครั้งนี้ ข้อมูลจะถูกเก็บเป็นความลับ รายละเอียด ของตัวผู้ให้สัมภาษณ์ ชื่อ ที่อยู่ จะไม่ปรากฏในข้อมูล ผู้ที่เข้าถึงข้อมูลใน ครั้งนี้ จะเป็น อาจารย์ ที่ปรึกษา ของ นักศึกษาผู้เป็นเจ้าของในโครงการวิจัยเท่านั้น เกิดความไม่พึงพอใจจากประสบการณ์ที่ได้รับจากภัยน้ำท่วมในครั้งนี้ก่อนคำแนะนำเบื้องต้นที่ท่านจะได้รับคือหยุดพักการตอบแบบสอบถาม หรือสัมภาษณ์ หรือให้คำปรึกษาสายด่วนสุขภาพจิต โทร 1667 หรือ 1323

### หากว่าท่านรู้สึกไม่พึงพอใจ หลังจากการเข้าร่วมงานวิจัยในครั้งนี้ จะยุติการเข้าร่วมในโครงการวิจัยได้อย่างไร

ถ้าหากท่านมีข้อสงสัยจากการเข้าร่วมโครงการวิจัยในครั้งนี้ ท่านสามารถสอบถามได้ทุกครั้ง หรือท่านสามารถติดต่อโดยตรงไปยังอาจารย์ประจำตัวของนักศึกษา หรือ คณะกรรมการจริยธรรมวิจัย ของ มหาวิทยาลัยที่นักศึกษากำลังศึกษาในขณะนี้ ข้อมูลการติดต่อได้แจ้งไว้ด้านล่างแล้ว

### ประโยชน์ที่จะก่อเกิดในการให้ข้อมูลในโครงการวิจัยในครั้งนี้

ประสบการณ์จากท่านในการให้ข้อมูลจะถูกบันทึกเป็นเรื่องราว และจะนำข้อมูล ที่ได้มาเป็น องค์ความรู้ ถึงการปรับตัวขององค์กรธุรกิจขนาดเล็กต่อกฎน้ำท่วม

### ท่านจะได้รับการปกป้องความลับของข้อมูลที่ได้ให้สัมภาษณ์อย่างไร

ข้อมูลจะได้รับการจัดเก็บอย่างเป็นความลับ ซึ่งจะไม่ปรากฏชื่อ ที่อยู่ของผู้ให้สัมภาษณ์ ข้อมูลจะไม่มีการแชร์ข้อมูลไปยังบุคคลที่สาม การเผยแพร่ข้อมูลจะไม่ปรากฏชื่อของท่านต่อสาธารณะ อันนำมา สู่บ่งบอกถึงตัวตนของท่าน หากมีการลักลอบเปิดเผยข้อมูลของท่าน โดยทางเราจะดำเนินการแจ้ง ต่อหน่วยงาน เบื้องต้นต่อไป

#### **ค่าใช้จ่ายในการเข้าร่วมโครงการวิจัยในครั้งนี้**

เนื่องจากโครงการวิจัยในครั้งนี้ได้รับสนับสนุนทุนการศึกษาจากรัฐบาลนิวซีแลนด์ ซึ่ง ผู้ทำวิจัยได้รับคัดเลือกเป็นนักเรียนทุนประจำปี ผู้เข้าร่วมในการตอบแบบสอบถามใน 2557 ชิ้นแรกจะ ไม่มี ค่าตอบแทน หากแต่การร่วมให้การสัมภาษณ์ แบบเชิงลึกจะมีค่าตอบแทนให้

#### **โอกาสที่ท่านจะได้เข้าร่วมให้การสัมภาษณ์แบบเชิงลึก**

ท่านจะได้รับการพิจารณาหลังจากที่ท่านได้ตอบแบบสอบถามข้อมูลเบื้องต้น ซึ่งคุณสมบัติ นั้น ได้พิจารณาจากแบบสอบถามที่ได้มา

#### **ท่านจะตอบตกลงเข้าร่วมโครงการวิจัยอย่างไร เมื่อท่านได้รับคำเชิญเข้าร่วมโครงการวิจัย**

ท่านจะได้รับข้อมูลเบื้องต้นจากโครงการวิจัยในครั้งนี้ และเซ็นใบยินยอม ในการเข้าร่วมใน โครงการวิจัยในครั้งนี้

#### **ท่านจะได้รับผลงานวิจัยในครั้งนี้หรือไม่**

ท่านจะได้อ่าน และ เสนอแนะ เปลี่ยนแปลงข้อมูล ทุกครั้งก่อนการมีการเผยแพร่ข้อมูลสู่สาธารณะ หลังจากการมีการเผยแพร่ทางตีพิมพ์ หากท่านมีความประสงค์ต้องการข้อมูล ผู้วิจัยมีความยินดีที่จะจัด เตรียม ผล งานตามความร้องขอ

#### **ท่านจะทำอย่างไรหากมีความประสงค์จะร้องเรียน ต่อโครงการวิจัยในครั้งนี้**

ท่านสามารถติดต่อโดยตรงไปยังอาจารย์ที่ปรึกษาของผู้วิจัย ได้ที่ ดอกเตอร์ Eve Coles ติดต่อทางอีเมลล์ [ecoles@aut.ac.nz](mailto:ecoles@aut.ac.nz) เบอร์ติดต่อ 9999 921 (0064)ext 7499 หรือ คณะกรรมการจริยธรรมมหาวิทยาลัย คุณ Kate O'Connor ติดต่อทางอีเมลล์ [ethics@aut.ac.nz](mailto:ethics@aut.ac.nz) เบอร์ติดต่อ (0064) 921 9999 ext 6038หรือ ที่อยู่ผู้ทำวิจัย บุญญาฤทธิ แสงนคร ([cometo\\_msf@hotmail.com](mailto:cometo_msf@hotmail.com)) เบอร์ติดต่อ (0064) 220 882 183

## Appendix E: Consent Form

### Consent Form

For use when interviews are involved.

Project title: **Understanding the Resilience of Small and Medium-scale Enterprises (SMEs) in Ayutthaya, Thailand to flood risk**

Project Supervisor: Eve Coles

Researcher: Boonyarit Saengnakhon

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated 29 February 2016
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.
- ☐ I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- ☐ If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.
- ☐ I agree to take part in this research.
- ☐ I wish to receive a copy of the report from the research (please tick one):  
Yes ☐ No ☐

Participant's signature: .....

Participant's name: .....

Participant's Contact Details (if appropriate):

.....  
 .....  
 .....  
 .....

### ใบยินยอมเข้าร่วมการสัมภาษณ์วิจัย(Informed consent)

ชื่อโครงการวิจัย กรณีศึกษาองค์กรธุรกิจขนาดเล็ก ในเขตชุมชน จังหวัดอยุธยา ในการปรับตัวต่อภัยน้ำท่วม

ชื่ออาจารย์ที่ปรึกษา .Dr Rhoda Sherman

ชื่อผู้วิจัย นายบุญฤทธิ์ แสงนกร

- ♦ ข้าพเจ้าได้อ่าน และทำความเข้าใจ ในข้อมูลจากเอกสารชี้แจงโครงการวิจัยข้างต้นแล้ว
- ♦ ข้าพเจ้าได้รับโอกาสในการสอบถาม และได้รับการชี้แจงจากผู้ทำวิจัยแล้ว
- ♦ ข้าพเจ้าได้รับทราบในขั้นตอนการสัมภาษณ์ โดยจะมีการจดบันทึก และมีการถอดแปลงเป็นอักษร
- ♦ ข้าพเจ้าเข้าใจถึงสิทธิการยกเลิกการให้สัมภาษณ์ ในระหว่าง หรือหลังการสัมภาษณ์ตามความยินยอมของข้าพเจ้า โดยไม่เสียสิทธิประโยชน์ใดจากการเข้าร่วมวิจัยครั้งนี้
- ♦ ถ้าหากข้าพเจ้ายกเลิก การเข้าร่วมการวิจัยครั้งนี้ ข้อมูลที่ให้สัมภาษณ์ไม่ว่าจะเป็นข้อมูลที่เป็นลายลักษณ์อักษร และข้อมูลการอัดทางเสียง ข้อมูลจะถูกทำลายทิ้ง
- ♦ ข้าพเจ้ายินดีเข้าร่วมในงานวิจัยครั้งนี้
- ♦ ข้าพเจ้ามีความปรารถนา ได้รับรายงานจากการวิจัยครั้งนี้ โปรดแสดงเครื่องหมาย X(
 

☐ ต้องการผลรายงาน
☐ ไม่ต้องการผลรายงาน

ลายเซ็นผู้เข้าร่วมการวิจัย.....

ลายมือชื่อผู้เข้าร่วมการวิจัย.....

ข้อมูลติดต่อผู้เข้าร่วมวิจัย.....

## Appendix F: Letter – Permission for Research

### Letter – Permission for Research

47/5A St.Pual  
street  
Auckland CBD, New  
Zealand 1010  
Date March 30, 2016

Dear Whom may it concerns

I am a student undertaking a masters in Emergency Management at the Auckland University of Technology. As part of my course I am undertaking a research study titled: *Understanding the resilience of Small and Medium-Scale Enterprises (SMEs) in Ayutthaya province to flood risk*. This study is part of my final year for my masters degree in Emergency management. It is hoped that the study can provide useful information for government and related official agencies about advice and recommendations given to various Small and Medium Enterprise (SMEs) in they can improve their resilience to flood risk.

Prior to undertaking the study, I need your agreement/consent to approach the 10 SME businesses within your area to take part in the study. I hope to recruit 10 participants. Data will be collected for the study using a questionnaire survey and semi-structured interviews.

I can assure you that I will make every effort to ensure any data collected will remain confidential. I have gained ethic approval for the study from the Auckland University of Technology and Ethics Committee.

My research is supervised by Eve Coles in Department of Emergency Management, School of Public and Psychosocial Studied, Faculty of Health and Environment Sciences.

Contact: [ecoles@aut.ac.nz](mailto:ecoles@aut.ac.nz)

Phone: (0064 921 9999 ext 7499)

Yours Sincerely

Boonyarit Saengnakhon

Research Title: **Understanding the resilience of Small and Medium-Scale Enterprises (SMEs) in Ayutthaya province to flood risk**

Email: cometo\_msf@hotmail.com

Phone 06 3384 821

47/5A St.Paul Street

Auckland CBD, New Zealand

1010

30 มีนาคม 2559

เรื่อง ขอบความอนุเคราะห์การสัมภาษณ์ในการศึกษาวิจัย

เรียน ผู้เกี่ยวข้อง

ด้วยข้าพเจ้า นายบุญฤทธิ์ แสงนคร ปัจจุบันเป็นนักศึกษาปริญญาโท สาขา Emergency Management มหาวิทยาลัย Auckland University Of Technology, Auckland New Zealand และอยู่ระหว่างการศึกษาค้นคว้าอิสระ เรื่อง กรณีศึกษาขององค์กรธุรกิจขนาดเล็ก ในการปรับตัวต่อภัยน้ำท่วม ในจังหวัดอยุธยา โดยมี Dr. Eve Coles เป็นอาจารย์ที่ปรึกษาการศึกษาวิจัยในครั้งนี้

เพื่อให้การศึกษาค้นคว้าอิสระในเรื่องดังกล่าว เป็นไปด้วยความเรียบร้อยและบรรลุวัตถุประสงค์จึงใคร่ขอความอนุเคราะห์ท่านในการให้สัมภาษณ์เกี่ยวกับการปรับตัวขององค์กรขนาดเล็กในจังหวัดอยุธยา เพื่อนำข้อมูลที่ได้ไปทำการศึกษาค้นคว้าอิสระในขั้นตอนต่อไป

จึงเรียนมาเพื่อโปรดพิจารณา หวังเป็นอย่างยิ่งว่าคงได้รับความอนุเคราะห์จากท่าน และขอขอบพระคุณมา ณ โอกาสนี้

ขอแสดงความนับถือ

นายบุญฤทธิ์ แสงนคร

นักศึกษาปริญญาโท หลักสูตร Emergency Management

Auckland University of Technology โทร .06 3384 8212

Email: cometo\_msf@hotmail.com