

**Improving the Effectiveness of Emergency Risk Communication
in Thailand**

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Abbreviations

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
ADRC	Asian Disaster Reduction Center
BMA	Bangkok Metropolitan Administration
CBDRM	Community Based Disaster Risk Management
CDC	Center for Disease Control and Prevention
CERC	Crisis and Emergency Risk Communication
DDPM	Department of Disaster Prevention and Mitigation
DOPA	Department of Provincial Administration
DPMPO	Disaster Prevention and Mitigation Provincial Office
DRM	Disaster Risk Management
ERC	Emergency Risk Communication
ERT	Emergency Response Team
EWS	Early Warning System
IFRC	International Federation of Red Cross and Red Crescent Societies
MCOT	Mass Communication Organisation of Thailand
MICT	Ministry of Information and Communication Technology
MOI	Ministry of Interior
NDPMC	National Disaster Prevention and Mitigation Committee
NDPMP	National Disaster Prevention and Mitigation Plan
NDWC	National Disaster Warning Center
NGOs	Non-Government Organisations
NOAA	National Oceanic and Atmospheric Administration
ONWFP	Office of the National Water and Flood Policy
OTOS	One Tambon One Search and Rescue team
PRD	Public Relations Department
RTP	Royal Thai Police
SNAP	Strategic National Action Plan
TAO	Tambon Administration Organisation
TEPCO	Tokyo Electric Power Company
UNISDR	United Nations Office for Disaster Risk 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:  Date: 2 May 2017

Sutiwa Pincharoen

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Abstract

For the last twenty years, Emergency Risk Communication (ERC) has become an important part of disaster management. However, many low- and middle-income countries have little best-practice guidelines about ERC because ERC is relatively new in such countries. This study examined the effectiveness of ERC practices in Thailand. Content analysis was the selected method to analyse good practices in ERC through ERC guidance, lessons learnt, reports, and academic publications. The thematic analysis was employed to develop the ERC framework of good practices criteria. The framework consisted of five key criteria of good practices including cultural, managerial, stakeholder, risk analysis, and communication channels, which were pulled from the academic literature and ERC practices globally. Each factor was further investigated by using the defined framework to provide additional insights into the gaps and good practices associated with the effectiveness of ERC in Thailand. The findings reveal that 1) cultural considerations and risk concerns are often neglected by ERC practitioners, 2) managerial issues such as policy, plan and guidance are also insufficient documents available at all level, 3) ERC stakeholders, particularly vulnerable groups, are usually ignored within ERC planning, 4) there is a lack of coordination among government agencies in the risk analysis process, which results in conflicting information, and 5) communication channels especially social media could be used to strengthen the ERC capability. The study concludes by proposing strategies to fill the gaps and strengthening ERC good practices in Thailand such as law amendment and underpinning ERC plan and guidance. These strategies are believed to potentially enhance disaster management capacity in Thailand and to that end increasing resilience in Thai communities.

Chapter One

Emergency Risk Communication

According to Vos, Rodriguez, Below, & Guha-Sapir (2010), a disaster refers to “a situation or event which overwhelms local capacity, necessitating a request to a national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering” (p. 5). Currently, disasters are occurring more frequently and are damaging society and economies throughout the world (EM-DAT, 2016). This increase in frequency and impact of disasters is due to a growing number of global warming-associated natural hazards, such as cyclones, flash floods and droughts (Letchumanan, 2010), as well as the increasing global population exposed to such hazards (Jongman, Ward, & Aerts, 2012). The magnitude and consequences of disasters can be determined by vulnerability conditions and hazard characteristics such as intensity, frequency and duration (Sato, 2015). These disaster events have the potential to cause physical damage to property and emotional trauma to people in affected communities (Glik, 2007; Ronan et al., 2008).

Disaster risk management (DRM) is a crucial process that helps practitioners deal with disasters in a way that reduces their devastating impacts (Seneviratne, Pathirage, Amaratunga, & Haigh, 2011). It can be categorised into three main phases: 1) the pre-crisis phase, focusing on prevention and preparation; 2) the response phase, focusing on response to a hazard during the crisis; and 3) the post-crisis phase, a time of recovery (Coombs, 2007; Waymer & Heath, 2007). However, DRM requires collaborative decision making, which needs a high level of complexity involving disaster management knowledge, time, and human resources (Othman, Beydoun, & Sugumaran, 2014).

The concept of DRM has risen to the forefront of disaster relief in recent decades. The catalysts for this rise include both internal and external factors and a need to mitigate risk in increasingly complex and multifaceted societies. Disaster relief management can help individuals and communities to identify risks and to respond in times of crisis to diminish potential negative impacts (Sato, 2015). Importantly, there are five principles of managing risks to consider: 1) openness and transparency of government agencies; 2) involvement of relevant stakeholders in the decision-making process; 3) proportionality and consistency in dealing with risks; 4) evidence upon which to base decisions; and 5) responsibility for managing risks (Her Majesty's Treasury, 2005).

Emergency risk communication (ERC) has its origins in DRM study (T. A. Steelman & S. McCaffrey, 2013) and has become an important part of the risk management process due to its ability to prompt practitioners to identify and perform appropriately within their roles and thereby, to cope with natural hazards (Sato, 2015). According to Renn (2004), integrating risk management practices and policies serves to enhance trust between government, institutions and individuals. Integration of practice and policy is framed by cultural norms and public expectations. The downside of this framing is a fragmented risk communication effort, which does little to reduce fear of hazardous events or to instil public trust in risk managers (Siegrist & Cvetkovich, 2000). Therefore, risk perception management and sharing situational awareness are integral

components of an effective risk management and communication strategy. For example, a road safety campaign relies heavily on a 'safety in mind' culture, which means that people follow the traffic rules easily because they perceive road traffic accidents (RTAs) as a crucial disaster issue. Thus, relevant government agencies promoting such campaigns should communicate in ways that shape risk awareness and a 'safety first' culture.

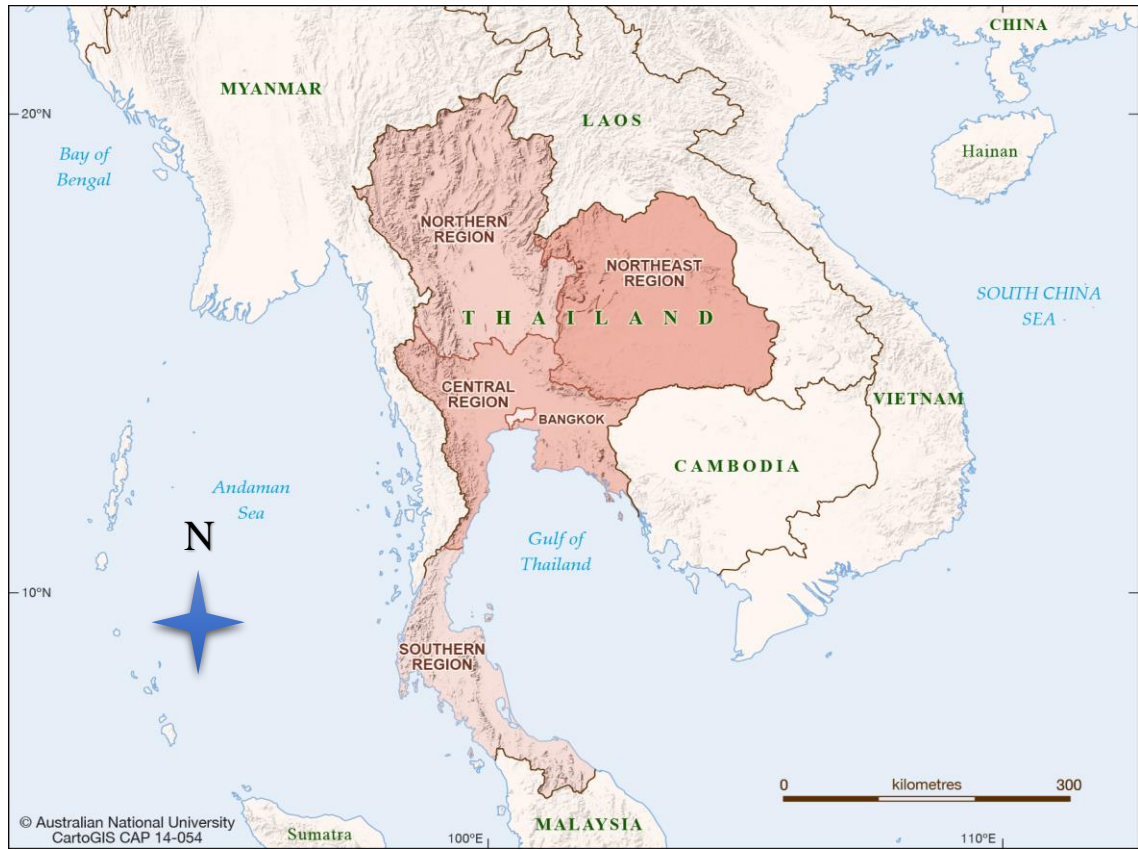
Over the past few decades, there has been a growing interest in DRM policies and actions using ERC (Coombs, 2007). ERC emerged as an important part of DRM policies to strengthen emergency preparedness (T. A. Steelman & S. McCaffrey, 2013). The Chernobyl accident of 1986 and the March 2011 accident at the Fukushima Daiichi Nuclear Power Plant in Japan highlight the importance of ERC (Sato, 2015). Yet, in many low- to middle-income countries, ERC is still quite new, and few best-practice guidelines exist (Sato, 2015). For example, countries such as Thailand and Malaysia have recently started to develop and implement ERC. However, ERC is still in its infancy in the region, and there are few fully developed best-practice guidelines or ERC models (Sato, 2015). Therefore, this study seeks to address this gap by 1) understanding what constitutes good practices in ERC in Thailand; and 2) further developing ERC good-practice strategies that are appropriate to this country.

In order to provide an introduction to the research, including the global situation of risk communication, this chapter will be organised into four sections. In section 1 of this chapter, I will describe and explain Thailand's current situation and its disaster relief issues, including DRM in Thailand. In section 2, I will illustrate risk communication concepts and related key terms. In the third section, I will present my rationale for the present study. Finally, in section 4 of this chapter, I will provide an outline of the dissertation.

1.1 Thailand and the Occurrence of Disasters

Thailand is located in Southeast Asia and covers 513,120 km². It is bordered by Myanmar, Laos, Cambodia, and Malaysia. It is also bordered by the Gulf of Thailand on the Pacific side and the Andaman Ocean on the Indian Ocean side in the Southern region. The total population is 67,976,405 (CIA-The World Factbook, 2016). Government administration comprises three levels, which are the central, provincial and local levels (DDPM, 2012). Thailand has 76 provinces (called Changwats) and the Bangkok municipality. The provinces are further divided into a total of 998 districts (called Amphoe), which are further subdivided into a total of 8,860 administrative sub-districts. The country can be divided by topography into four main regions, which are the Northern, Northeastern, Central (including Bangkok) and Southern regions (Figure 1).

Figure 1. Map of Thailand. This map clearly shows the four administrative regions and the municipality of the capital city, Bangkok.



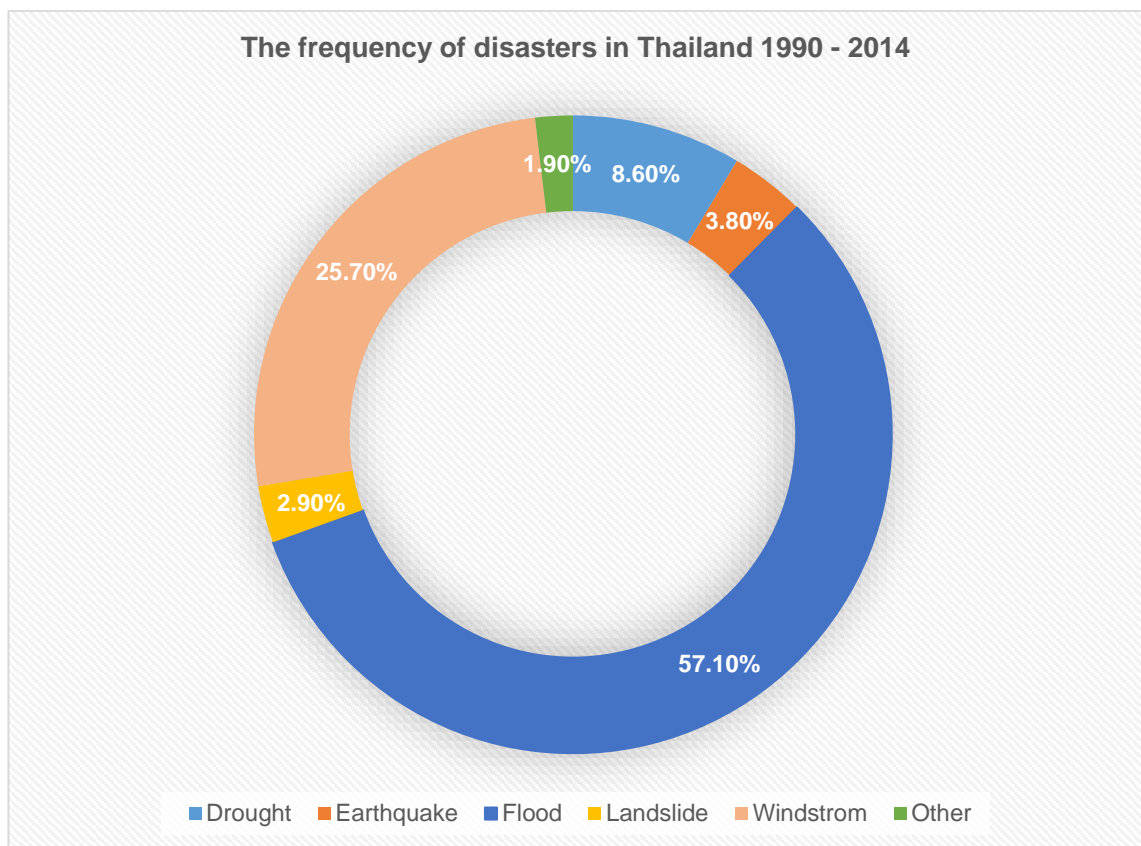
Source: The Australian National University, 2016.

Due to its location in a tropical zone, the country's weather is influenced by monsoons, which are usually accompanied by heavy rain, resulting in many types of disasters (Khunwishit & McEntire, 2011), such as floods and landslides. In addition, each region has different geographic features that impact the course of disasters. In the Northern region, the terrain is mountainous with many fault lines, which renders this region susceptible to earthquakes, severe winter weather, wild fires, and flash floods. The Southern region's terrain is hilly on the west side, with a coastal plain on the east; this region's communities are faced regularly with floods, tsunamis, and storm surges. In contrast, the Central region is a vast, fertile plain, often inundated by riverine floodwaters. The Northeast region is an arid area on the high Korat Plateau and is usually affected by droughts followed by floods. In addition, a few decades ago, Thailand also faced several man-made disasters, including industrial accidents, chemical spills and RTAs as the undesirable outcomes of rapid progress in economic and social development (DDPM, 2012).

Thailand is increasingly vulnerable to disasters. Vulnerability is defined by the International Federation of Red Cross and Red Crescent Societies (IFRC, (2016) as "the diminished capacity of an individual or group to anticipate, cope with, resist and recover from the impact of a natural or man-made hazard" (p. 1). Khunwishit and McEntire (2011) have pointed out that there are three main factors contributing to the vulnerability of the Thai people: 1) socioeconomic characteristics, 2) buildings and infrastructure characteristics, and 3) living

locations. For example, many people live in flood-prone areas, which may cause susceptibility to large-scale flood disasters. Furthermore, low socioeconomic status and a lack of access to social security systems worsen already bad outcomes. Although Thailand has a high economic ranking among middle-income countries (World Bank, 2016), there are nearly 8.5 million people living below the poverty line in 2016 (CIA, 2016). In addition, there are approximately 2.4 million migrants from neighbouring countries (Myanmar, Lao, and Cambodia) working in Thailand, over 440,000 stateless persons, and nearly 130,000 refugees from Myanmar (CIA-The World Factbook, 2016). Moreover, Thailand is also at increased risk due to political issues such as violence associated with political problems in the Southern region and political polarisation among its citizens throughout the country (Khunwishit & McEntire, 2011).

Figure 2. The frequency of disasters in Thailand, 1990 – 2014. Floods form the largest portion of disaster events by far, followed by storms, which often cause floods.



Source: EM-DAT International Disaster Database, 2015.

According to Thailand's disaster statistics, there are five main types of major disasters that occur in Thailand, in order of prevalence (Figure 2).

1) Floods (57.1% of disasters) are the most devastating hazard in Thailand due to an increasing number of people living in river basin areas and the impacts of climate change. The Thai Secretariat of the House of Representatives and the Office of the National Water and Flood Policy (as cited in DDPM, 2016) have reported on the major floods in Thailand from 2005 – 2015; in the 10-year period, there were seven major floods that trended to increase in number of affected people and houses. The DDPM under Thai Ministry of the Interior (MOI, 2016) has

summarised flood-causing factors in Thailand, which are tropical cyclones, monsoons, strong monsoons, rain storms or thunderstorms and high tides.

2) Windstorms (25.7% of disasters) associated with floods usually occur in Thailand during the monsoon months, from June to November. When a tropical storm wind weakens, it can cause heavy rains and severe flooding, which can affect a large area, especially in the centre of the storm (DDPM, 2012). Such hazards can cause massive property damage and huge losses in economic terms. For instance, Tropical Storm Ira on October 12, 1990 killed 24 people and damaged nearly 2,500 mi² of farmland (DDPM, 2016).

3) Droughts (8.6% of disasters) occur annually during summer, between March and April. The amount of water in dams and reservoirs is often insufficient for public consumption, a shortage exacerbated by high water demands for agricultural activities (DDPM, 2012).

4) Earthquakes (3.8% of disasters) may occur in the northern province of Thailand. Although Thailand is located in a region that is relatively safe from earthquakes, the area has previously been affected by many tremors in the north, west, and south. These earthquakes were caused by two active faults (Heednacram & Lertchuwongsa, 2015). For example, on May 5th, 2014, a 6.1 magnitude earthquake occurred in the province of Chiang Rai. The epicentre was located in the Mae Lao district in Chiang Rai. This event caused unprecedented damage to 594 buildings, which were left unsafe for occupancy. This disaster is perceived to this day as the most damaging earthquake ever in Thailand's history (Lukkunaprasit et al., 2015).

5) Landslides and mudslides (2.9% of disasters) may occur simultaneously or after flash floods caused by heavy rains. This is due to the poor water-holding capacity of soils in Thailand. Landslides/mudslides tend to occur more frequently and with more severity in Thailand because of human activities such as deforestation and farming in already degraded areas (DDPM, 2012).

1.2 Disaster Risk Management in Thailand

A few decades ago, emergency management in Thailand was focused on civil defence in order to take action effectively in response to threats only, whereas current disaster management policy takes into account many hazard types such as public security, natural disasters and other hazards (Khunwishit & McEntire, 2011). There are many related disaster management agencies in Thailand such as fire agencies, police, and local authorities. However, as legislation specifies responsibility and authority in the Disaster Prevention and Mitigation Act B. E. 2550 (2007), the DDPM, Ministry of Interior (MOI) and the National Disaster Warning Center (NDWC) under the Ministry of Information and Communication Technology (MICT) have become the nation's major agencies responsible for ERC in relation to natural disaster in Thailand.

The DDPM has its headquarters in Bangkok, and its managers run 18 regional disaster prevention and mitigation centres and 76 provincial offices for disaster prevention and mitigation. As part of the DDPM, the disaster prevention and mitigation provincial offices also play an important role as the leading agencies for emergency management across their specific administrative areas. The DDPM is designated to be responsible for disaster management in the four phases of emergency management (DDPM, 2016):

1) The preparedness phase occurs before a disaster. The DDPM provides support to the provinces to prepare activities such as formulating disaster management education initiatives, training civil defence volunteers and conducting drill exercises.

2) The prevention and mitigation phase occurs before a disaster or any potential event. The DDPM implements prevention and mitigation activities such as supporting provincial disaster management plans and hazard mapping.

3) The response phase occurs during a disaster or any potential event. The DDPM sets up an operations centre, coordinates with all agencies concerned and disseminates disaster-related information to the public.

4) The recovery phase is the aftermath of disasters. The DDPM is responsible for providing relief to affected people, conducting damage and loss assessments and for providing financial assistance.

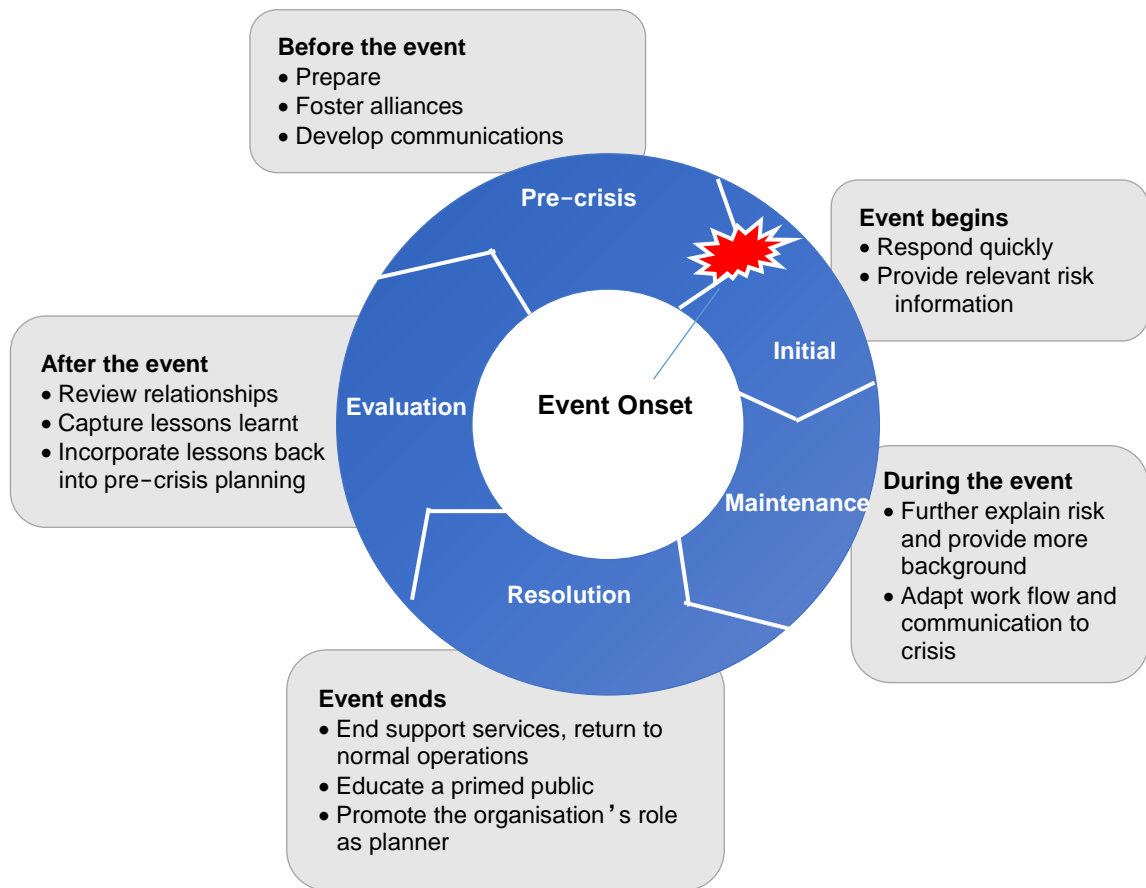
The NDWC is a national organisation responsible for early warning systems (EWS). It was established on October 3, 2002 by the Bureaucratic Restructuring Act of B.E. 2545 (2002). The NDWC is mainly focused on warning generation and dissemination of information. The NDWC's functions can be seen as duplication of and as overlapped with the DDPM's functions (Fakhruddin & Chivakidakarn, 2014).

1.3 Emergency Risk Communication Concepts

In order to understand the concept of ERC, there are many important key terms to consider including risk, risk perception and crisis communication. Risk has been defined by the United Nations Office for Disaster Risk Reduction (the United Nations International Strategy for Disaster Reduction, 2009) as "the combination of the probability of an event and its negative consequences" (p. 25). Thus, hazards can generate risk, which may cause impacts or undesirable outcomes. In addition, the concept of ERC is also related to how the general public perceives and relates to risks. According to Chowdhury and Haque (2011), risk perception refers to "people's beliefs, attitudes, judgments and feelings, as well as the broader social or cultural values and dispositions that people adopt, towards hazards and their benefits" (p. 1,017). In this context, a crucially important aspect of ERC involves the public's trust in risk managers and risk communicators, which can influence public willingness to accept risk and to support decision making by risk communicators (Earle, 2004; Renn & Levine, 1991). In fact, improving risk communication can enhance risk management by increasing public trust in government agencies. Earle, Siegrist and Gutscher (2007) have emphasised that trust in the messenger is often necessary in order to leverage personal relationships that may signal credibility to the public. In contrast, disbelief in and distrust of risk communicators can raise public concerns over the risks (Poortinga & Pidgeon, 2003).

There are many definitions of ERC itself (Hampel, 2006). According to Covello (1992), ERC means "the exchange of information among interested parties about the nature, magnitude, significance, or control of a risk" (p. 359), whereas Glik (2007) defines ERC as an exchange of information about the risks that may be caused by environmental and industrial activities and policies. Thus, ERC involves disseminating messages about not only risks but also risk reaction as an important aspect of DRM (Figure 3).

Figure 3. Emergency risk management life cycle. Note the five distinct phases.



Source: Adapted from the National Oceanic and Atmospheric Administration (NOAA)'s National Centers for Environmental Information (NCEI), 2016.

Moreover, ERC is closely related to crisis communication, which is defined as the interaction of information and the management of meaning before, during and post-crisis (Coombs, 2010). The distinction between ERC and crisis communication has been identified by Sato (2015): ERC involves a hazard that might happen, but crisis communication focuses on the ongoing state of the incident during and after its happening.

1.4 Rationale of the Current Study

Over the past few years, ERC has become an important function of DRM worldwide (Höppner, Whittle, Bründl, & Buchecker, 2012). There seems to be progress in the development of best practices for ERC in many countries such as the United Kingdom (UK) and the United States (US), where ERC has been used for a long time (MacDonagh et al., 2016).

Currently, based on learnings from past major disasters, such as the tsunami in 2004 and flooding in 2011, Thailand's ERC system appears to have a critical problem relating to the coordination required to disseminate disaster information to various concerned agencies; multiple overlapping agency involvement causes confusion in the public arena (Jongsuksomsakul, 2013). Yet, coordination is essential if EWS, hazard awareness and

guidance are to be improved (Kabir, Suddhi-Dhamki, & Fang, 2011). Moreover, although there has been much research focusing on risk management, there is only a small amount of research available about the subject of ERC as it applies in Southeast Asian countries. Furthermore, to date, no systematic review focusing on ERC systems in Thailand exists. Therefore, this study aims to explore how ERC in Thailand can be improved through the collective understanding of good practices in ERC globally, which could bridge the gaps in knowledge in Thailand. This goal can be achieved by comparing existing ERC practices to those in other countries.

The present study aims to address the following research question: “How can ERC in Thailand be improved through the use of good practices?” Therefore, the objectives of this study are to:

- 1) Review existing good practice in ERC globally to develop a framework.
- 2) Review existing good practices and gaps in ERC in Thailand against the developed framework.
- 3) Identify challenges and opportunities to implement ERC good practices in Thailand.

To discover similarities and differences in ERC practices worldwide and to find ways to increase the effectiveness of risk communication based on good practices, a qualitative content analysis approach and a thematic analysis are used for the current research. This methodology will enable me to propose the possible strategies to fill the current ERC gaps and implement good ERC practices that could enhance disaster management in Thailand. This approach will also add value to the global body of knowledge about effectiveness in ERC.

1.5 Dissertation Structure

The presented dissertation is divided into five chapters. In chapter one, I have provided basic knowledge about my research topic. In chapter two, I review the existing literature on ERC. In chapter three, I describe the research methodology used for the current study. Chapter four consists of a detailed description of my findings as they relate to existing ERC practices in Thailand. Chapter five is an examination of my findings and how they fit in with the existing academic literature on ERC. In this concluding chapter, I discuss the implications for ERC in Thailand. In the last chapter, I also identify the limitations of the present study and provide recommendations for future research.

Chapter Two

Literature Review

The present study aims to 1) review existing good practices in ERC globally; 2) review existing good practices and gaps in ERC in Thailand; and 3) identify challenges and opportunities to fill current ERC gaps and to implement good practices in Thailand. Therefore, this chapter starts with an introduction of common definitions in the field of ERC, including risk communication and crisis communication. In the second part of the chapter, I review existing literature on ERC theory, and I provide an overview of ERC in accordance with managerial factors, stakeholder involvement, risk assessment processes, crisis communication channels and cultural issues influencing ERC outcomes.

2.1 Key Definitions in Emergency Risk Communication

The failures of risk communication to protect the public, such as in the Hurricane Katrina incident in the US and during the 2005 avian influenza outbreak in Thailand, have provided a starting point for reviewing the need for effective ERC. As these events revealed, a lack of information sharing and inadequate risk communication with the public resulted in economic losses and increasing, unnecessary panic, which in turn caused morbidity and mortality and exacerbated the crises (Shufutinsky, Kovar, Shufutinsky, Pernsteiner, & Johnson, 2014). Bram and Vestergren (2011) have pointed out that in large-scale disasters, communication often involves a multi-organisational effort using both formal and informal channels. Therefore, ERC needs to function properly to prevent communication breakdowns and to increase emergency management efficiency (Wilson, Salas, Priest, & Andrews, 2007).

Risk and crisis

Risk, crisis, risk communication, and crisis communication are all connected to one another but have different defining characteristics and meanings. Risk refers to the possibility that an unpleasant event will occur (UK's cabinet office, 2011). Likewise, Falkenheimer and Heide (2010) have proposed a definition of crisis as a time when "the normal order in a system is destabilized, which creates considerable uncertainty and requires rapid intervention" (p. 514). Falkenheimer and Heide (2006) have also noted that crisis might occur if risks are ignored. Furthermore, Heath (2010) concludes that "a crisis is a risk manifested" (p. 3). All of these terms have become a part of ERC itself, but ERC is also a stand-alone concept.

Risk and crisis communication

According to the UK Cabinet Office's guidance on communicating risk to resident populations, risks are divided into five different types: 1) activities that may cause risk such as playing sport and travelling; 2) hazards such as flooding and disease; 3) events that may happen, such as accidents or becoming ill; 4) the consequences of events such as injury or financial loss; and 5) the values that people attach to possible outcomes, such as alternative options to do risky activities (UK's cabinet office, 2011). Sarewitz, Pielke, and Keykhahthe (2003) have also

classified risk into two categories: 1) event risk, the potential for damage from a hazard occurrence; and 2) outcome risk, the potential for undesirable outcomes from hazardous events.

As mentioned in chapter 1, the definition of risk communication is derived from multiple disciplines. Although there is no shared common definition of ERC, scholars still try to characterise and identify risk types. Coombs (2010) has defined crisis communication as “the collection, processing, and dissemination of information required to address a crisis situation” (p. 20). In contrast, ERC also has a more complex definition:

the attempt by experts to provide information to allow an individual, stakeholders, or an entire community to make the best possible decisions about their wellbeing within nearly impossible time constraints and ultimately accept the imperfect nature of choices during the crisis. (Oak Ridge Associated Universities, 2003, p. 2)

This study focuses on the most general concept of risk communication, which is defined by Breakwell (2000) as the process of exchanging information among individuals, groups and organisations regarding risks to health, safety and the environment.

Emergency risk communication

In terms of the communicator, ERC differs from crisis communication in that the communicator can be perceived of as an agent dealing with crises or emergencies, not as a participant in disasters (Oak Ridge Associated Universities, 2003). The concept of ERC is different from risk communication in that decision making in the ERC arena is under urgency and involves uncertainty. In addition, ERC decision making is based on imperfect or incomplete information. Therefore, ERC depends on an expert’s view to persuade message receivers to take actions that empower the view, knowledge, perceptions, specificities of local people to make the best decisions in crises or disasters (Oak Ridge Associated Universities, 2003). This means that ERC is an imperative component in effective emergency management (Crichton, Flin, & Rattray, 2001).

Despite the fact that many ERC definitions reflect different components of risk communication, all definitions revolve around 1) a dynamic cycle, 2) an interactive process, and 3) a process involving different groups of stakeholders (Infanti et al., 2013). In the current research, I examine these key features to ascertain how they contribute to effective ERC.

2.2 Identified best practices for effective ERC

The concept of risk communication has been a growing study over the last decade. Many theories, models and best practices have been proposed to explain and to improve ERC effectiveness (Sheppard, Janoske, & Liu, 2012b). However, there is a shared understanding between academics and practitioners that “...no single theory or model ... captures the full range of considerations that impact risk communication efforts” (Sheppard et al., 2012b, p. 2). Although ERC theories, models, and guidance suggest diverse ERC strategies, they often show similarities in ERC good practices to handle a crisis. Hence, the present study includes the traditional approach, the mental noise model, the crisis and emergency risk communication (CERC) model

and other best practice models to identify key components of the ideal ERC good-practice template.

Effectiveness in ERC is a crucial element of disaster management required to attain its desired outcome in order to build resilient communities (T. A. Steelman & S. McCaffrey, 2013). Effective ERC is also essential to ensure that people and organisations can take actions to alleviate risks in emergency situations (Breakwell, 2000; Coombs, 2007; Seeger, 2006). A vast body of literature describing ERC good practices can be found in many countries, especially in the UK, the US and Japan, due to the fast growth of this field of research in these countries. This body of research has strengthened and developed through learnings from disasters.

The traditional approach

In the traditional approach, risk communication practitioners have focused on disseminating information to facilitate protective measures by using government resources such as guidelines, media campaigns and websites (Haer, Botzen, & Aerts, 2016; Sato, 2015). Such communication processes are concerned only with conveying messages accurately, in a timely fashion and in a way that is useful for recipients acting on the messages (Seeger, 2006); such processes are without consideration of an individual's ability to decipher the messages (Fekete, 2012). O'Neill (2004) has further explained that these communication processes are usually an example of 'one-way communication' and presume that the audience is an indistinguishable cultural group sharing the same needs and values as the communicators.

The mental noise model

In the realm of ERC, a model refers to "an abstract representation of a system or process to help describe the consequences and interrelationships of decision and events" (Sheppard et al., 2012b, p. 2). One important model of risk communication is the mental noise model (V. T. Covello, Peters, Wojtecki, & Hyde, 2001), which is focused on the way people process and communicate under stressful situations. Developers of this model have described circumstances in which people confront threats and the impact of stress, which may cause mental unrest and hinder people's ability to process information effectively (Sato, 2015). Covello et al. (2001) have also explained that threats may interfere with cognitive functioning and may cause different forms of emotional outbreaks, which can trigger the impairment of an individual's cognitive skills to perform rational discourse. As such, it is important for ERC to be undertaken in a timely and accurate manner, including repetitions to reach the target audiences (Infanti et al., 2013).

The crisis and emergency risk communication model

Other Another important ERC model is the crisis and emergency risk communication (CERC) model, which is derived from practitioner advice, theory orientation and research evidence (Veil, Reynolds, Sellnow, & Seeger, 2008). The CERC framework is a compilation of various risk and crisis communication disciplines, which means various features of these disciplines have been selected for inclusion in the CERC framework based on their theoretical and practical relevance. The CERC model assumes that a crisis will unfold in a somewhat predictable and systematic manner and comprises five distinct stages of strategy planning, which

are related to disaster and its different phases (Reynolds & Seeger, 2014). These five stages are illustrated in Table 1.

Table 1

The Five Stages of Disaster Strategy Planning

Phase	Communication aims	Strategies
Pre-crisis	To prepare risk messages, warnings, and guidance for the public and communities	Building trust and testing messages
Initial event	To reduce uncertainty and to increase readiness in the public and target groups	Informing with messages, building credibility, and providing emergency knowledge
Maintenance	To continue the communication	Providing information, receiving feedback, correcting misinformation and empowering decision making
Resolution	To update resolutions and understandings to the public	Examining problems, persuading the public to support policies and promoting the organisation
Evaluation	To discuss the response and lessons learnt by agencies and communities	Evaluating the communication plan

Note: These five stages are delineated in the crisis and emergency risk communication (CERC) model.

Source: Adapted from (Reynolds & Seeger, 2005).

The CERC model (Veil et al., 2008) was developed by the US Centers for Disease Control and Prevention (CDC) in Atlanta, GA to provide principles and practical tools to respond to different types of hazards. In support of this model, Palttala, Boano, Lund, and Vos (2012) have noted that in order to improve ERC, practical lessons in best practices are very important. The CERC model is focused on strategies and tasks specific to each phase of risk communication, and the CERC template helps practitioners to plan risk communication with regard to specific target audiences; the template includes a message development process as well (Sato, 2015).

Another remarkable effort to improve ERC is the development of a best practices framework. Seeger (2006) has pointed out that ‘best practice’ is an approach developed to improve the effectiveness of crisis communication in a professional way; in fact, the best practice framework is often practice-driven and may also have emerged from multidisciplinary inputs. Tinker and Vaughan (2010) have further defined best practices as “a set of principles and guidance about the processes and content of communication” (p. 1), which have their foundations in achieving effective risk communication with increased desired results. The criteria used to develop best practices are numerous (Tinker & Vaughan, 2010), such as a consensus among

practitioners and researchers, scientific evidence, reproducibility across disciplines and effectiveness in improving communication processes.

A concrete example of best practices is the following set of 10 best practices for crisis communication, which have been identified by a panel of crisis communication experts:

- a process approach and policy involvement;
- pre-event planning;
- treating the public as partners;
- taking into account public concerns and audience differences;
- using honest communication styles;
- choosing credible sources;
- working with the needs of the media;
- expressing empathy, concern, and compassion;
- acknowledging uncertainty; and
- crafting concrete action messages (Seeger, 2006).

Coombs (2007) has also proposed good ERC pre-crisis practices, which are: 1) having an up-to-date crisis management plan; 2) having a crisis management team in place; 3) conducting exercises to test the plan and team; and 4) developing pre-crisis draft messages. In times of crisis, Coombs (2007) has stipulated additional best practices: 1) distributing all information promised to stakeholders; 2) communicating with stakeholders to update recovery effort progress; and 3) analysing the crisis management effort for lessons learnt. Post-crisis, Coombs (2007) has recommended three additional best practice components: 1) delivering all information needed by stakeholders to contribute; 2) updating stakeholders on recovery progress; and 3) analysing lessons learnt. Finally, Coombs (2015) has also noted that sufficient communication may lead to a worse outcome. This is because without considering the aspect of people's perceptions and solely focusing on ERC messages, communications may not lead to desired recovery actions (The National Oceanic and Atmospheric Administration, 2016).

Notwithstanding difficulties, there has been a growing commitment among practitioners to identify core principles underpinning effective ERC. Although there is no common guiding principle, there is a mutual understanding among practitioners that core principles can be adapted to form a guideline strategy for ERC best practices (MacDonagh et al., 2016). Table 2 outlines the examples of different approaches illustrating pivotal principles behind good ERC.

Table 2

Key Principles Underpinning Effective ERC

Strategy statement	Principles of ERC	Sources
Seven cardinal rules	<ul style="list-style-type: none"> ✚ Treating the public as a partner ✚ Listening to public concerns ✚ Being honest, frank, and open ✚ Working with credible sources ✚ Meeting media needs 	Covello and Allen (1988)

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	<ul style="list-style-type: none"> ✚ Speaking clearly and with compassion ✚ Planning and evaluation 	
WHO	<ul style="list-style-type: none"> ✚ Building trust ✚ Announcing updates early ✚ Transparency ✚ Listening to public concerns ✚ Planning 	World Health Organization (2008)
UK alerting guidance	<ul style="list-style-type: none"> ✚ Understanding the population ✚ Establishing ongoing communication ✚ Using multiple alerting methods ✚ Using social media ✚ Ensuring message consistency ✚ Telling sources of revealing information sources ✚ Encouraging people to take action ✚ Explaining false alarms 	The Defence Science and Technology Laboratory (2012)
CERC	<ul style="list-style-type: none"> ✚ Being the first source of information ✚ Providing accurate information ✚ Being credible ✚ Expressing empathy ✚ Promoting concrete action ✚ Showing respect in all communications 	Reynolds and Seeger (2014)
NOAA	<ul style="list-style-type: none"> ✚ Having a plan in place ✚ Speaking to the public interests ✚ Explaining the risks ✚ Offering alternative options ✚ Working with trusted sources ✚ Testing messages ✚ Using multiple channels 	The National Oceanic and Atmospheric Administration (2016)
Drivers	<ul style="list-style-type: none"> ✚ Trust ✚ Context of recipient ✚ Diversity of audiences ✚ Two-way communication ✚ Relationships 	MacDonagh et al. (2016)

Abbreviations: ERC, emergency risk communication; CERC, crisis and emergency risk communication.

It is important to note that much of these good practice criteria derived from risk communication literature show similarities (Höppner et al., 2012; Infanti et al., 2013), as illustrated in Table 3.

Table 3*Summary of Similarities in Good Practice Principles Underpinning Effective ERC*

General criteria	Good practices in ERC
Cultural considerations	<ul style="list-style-type: none"> ✚ Understanding perceptions and concerns of target audiences (Covello & Allen, 1988; World Health Organization, 2008) ✚ Taking into account differences in cultures and demographics (MacDonagh et al., 2016; The Defence Science and Technology Laboratory, 2012) ✚ Building trust (World Health Organization, 2008; MacDonagh et al., 2016)
Managerial issues	<ul style="list-style-type: none"> ✚ Clarifying the purposes of ERC and ensuring mutual understanding on all levels by all stakeholders (Covello & Allen, 1988; The Defence Science and Technology Laboratory, 2012) ✚ Ensuring plans and guidance documents are in place and clarify roles and responsibilities, including resources for relevant actors (Covello & Allen, 1988; The National Oceanic and Atmospheric Administration, 2016; World Health Organization, 2008)
Stakeholders	<ul style="list-style-type: none"> ✚ Addressing the requirements for different ERC messages for different audiences across different stages of the crisis (MacDonagh et al., 2016; Reynolds and Seeger, 2014) ✚ Considering the accessibility of ERC, especially for vulnerable groups (MacDonagh et al., 2016; The Defence Science and Technology Laboratory, 2012)
Risk analysis	<ul style="list-style-type: none"> ✚ Translating technical terms into a clear and simple language (The National Oceanic and Atmospheric Administration, 2016; World Health Organization, 2008) ✚ Evaluating the process of risk communication and the outcome and providing lessons learnt to the involved actors (Covello & Allen, 1988; The National Oceanic and Atmospheric Administration, 2016)
Communication channels	<ul style="list-style-type: none"> ✚ Using a mixed of communication language and ongoing communication (The Defence Science and Technology Laboratory, 2012; The National Oceanic and Atmospheric Administration, 2016) ✚ Using multiple channels, especially social media (The Defence Science and Technology Laboratory, 2012; The National Oceanic and Atmospheric Administration, 2016)

Abbreviation: ERC, emergency risk communication.

Based on the existing literature describing key principles needed to instil good practices in ERC (Table 3), there appears to be a multi-factorial interaction of the main elements that influence ERC effectiveness. These factors include cultural, managerial, stakeholder, risk

analysis and communication channel factors. Each factor requires further investigation in order to provide additional insights into what makes ERC effective and to identify existing good practices. Thereafter, key criteria can be integrated to develop a best practice framework and to identify existing gaps and good practices in Thailand. Each key criterion — and existing good ERC practices in a general context — are reviewed in the next sub-sections.

2.2.1 Cultural Factors

It is imperative to consider how cultural norms and values influence risk communication within cultures. This is because an individual's subjective evaluation of risk and risk sources is very important to overall risk assessment in that it may cause the misdirection of public and environmental protection if such evaluations are faulty (Slovic, Fischhoff, & Lichtenstein, 1981). There are three important ERC good practices relating to cultural considerations, which are: 1) understanding risk perceptions and addressing the concerns of target audiences; 2) taking into account the differences in cultural contexts and demographics; and 3) building trust through shared understanding.

Understanding risk perception

According to Sato (2015), risk perception refers to “a dynamic phenomenon based on psychological and cognitive process” (p. 3). Riley (2014) has stated that it is crucial to characterise what the public already knows and believes and to understand different dimensions of risk perception, which foster beliefs and behaviour. One example is the perception of disasters as Acts of God and that there is nothing that people can do to prevent or to control disasters (Renn, 2004). Such a perception may lead certain groups of people to neglect prevention and preparedness measurements.

Sjöberg (2000) has also highlighted a link between risk perceptions and risk hazards in that a man-made hazard, such as a radiological accident or an industrial dangerous chemical leakage, may induce more fear than a natural disaster. This is often because people perceive failures in prevention measures and failures in professional responsibility when disasters are man-made (Sato, 2015).

In terms of risk perception, the works of Sato (2015) and Sjöberg (2000) have indicated that people often exhibit a high concern about potential events that are imposed, uncontrolled, unfamiliar, unforeseen and potentially disastrous in localised areas, without regard to the relative frequency of such events. Therefore, risk communicators need to address these concerns to reduce fear and to foster a sense of control in order to encourage the people taking response countermeasures to do so appropriately.

Cultural considerations

Within cultural contexts, Roeschman (2014) has noted that risk culture — within the context of culture itself — involves psychological aspects such as risk awareness, ethics and behavioural aspects. Cultural beliefs can help to explain how the public responds to risk communication and the way government agencies act during an event. For example, dissemination of warning messages in different cultures requires consideration of the message

content; content must be consistent with what people believe in each region such as an earthquake message delivered to Samoans versus Maori.

Risk messengers often seek to facilitate behaviour changes in a way that improves technical understanding of risks, which may require adaptation of the message to cultural or social factors (Reynolds & Seeger, 2005). However, recent work on communication strategies in England, the Netherlands and Flanders has revealed that top-down government campaigns are often unsuccessful in motivating people to take protective measures against flooding, which is partly because such campaigns have neglected different cultural attitudes towards flooding (Haer et al., 2016). This lack of success implies that government campaigners should take into account what constitutes either a negative or a positive attitude towards specific types of hazards; such knowledge can be used to improve ERC effectiveness where certain key aspects are strongly related to cultural factors.

It has also been noted by Tinker & Vaughan (Tinker & Vaughan, 2010) that despite the emphasis of most theories and models on the importance of addressing social and cultural beliefs, such beliefs are often inadequately integrated into communication plans, which is one of the largest gaps in ERC. Furthermore, Coombs (2010) has also pointed out that key concerns in crisis communication regarding cultural issues include “how culture shapes perceptions of what constitutes a crisis, how stakeholders in different cultures react to the same crisis response strategy, how culture affects the selection of crisis response strategies, and how the expectations of stakeholders differ” (p. 722). These concerns are deliberate challenges to how applicable Western core principles and practices for effective ERC are in different cultures and countries, such as Asian nations.

Building trust

Earle (2004) has stated that one of the crucial risk perception factors is the public's level of trust in risk managers, which can cause the public to perceive risks as greater than they are or can translate into disbelief in leaders. Credibility is a related crucial factor and is about the believability and effectiveness of messages (Reynolds & Seeger, 2005). Finally, trust in a message is often derived from past experience with the source of the message, communication channel and/or its content (MacDonagh et al., 2016). This means that trust is a very crucial element behind what people believe and do; therefore, building trust may be the underlying all-important factor for effective ERC implementation.

When taking action to avert a crisis, one of the most prominent reputation-repair strategies for organisations is denial, which allows managers to seek to reduce adverse outcomes by shifting blame or responsibility to other actors (Coombs, 2015). However, consequent delay in taking action and having reputational concerns as a first priority rather than public safety, may exacerbate the problem (MacDonagh et al., 2016). This is because emphasising reputational concerns can reduce trust in risk managers and can result in disbelief in risk reduction measurements, which may result in the unsuccessful implementation of ERC.

According to Boin, Hart, and McConnell (2009), the most important factors affecting trust in risk managers' decision making are the audience's level of responsibility and their expectations. In fact, a lack of trust or distrust in the information source and in risk managers may amplify risks

and may aggravate the public's concerns, especially with regard to man-made hazards (Sheppard, Janoske, & Liu, 2012a; Siegrist & Cvetkovich, 2000). An example of a trust issue is the outbreak of the West Nile Virus in Egypt, during which public health officials and relevant government agencies were blamed for not taking adequate measurements and for a delayed response (Reynolds & Seeger, 2005).

However, it has been acknowledged that although building trust is an essential best practice, it may be difficult to achieve this within a group that has a low level of trust in government agencies (Tinker & Vaughan, 2010). Such a group may also mislead the general public and may persuade others to disregard response guidelines or risk mitigation arrangements. Therefore, risk communicators also need to limit these groups' ability to spread misdirection or rumour.

2.2.2 Managerial Factors

Managerial factors in this study refer to disaster management policy, legislation, and planning. The two underlying elements of ERC good practice relating to managerial factors are 1) ensuring that the purpose or objectives of ERC are clear and that a mutual understanding at all levels for all stakeholders exists; and 2) ensuring that plans and guidance documents are in place and clearly describe roles and responsibilities of actors, including resources available to the actors.

Clarifying purpose and objectives

Relevant stakeholders at any level including local, national, and international, should be able to understand purposes and objectives clearly. This is because all stakeholders require consistency in communication and implementation to achieve the same goal. For example, the objective of risk communication in the midst of a crisis is to get people to focus on making sense of the situation to reduce potential impacts and to resolve the crisis (Meer, 2016).

In addition, Birkland (2010) describes that disaster management policies are defined by political involvement due to the processes of resource allocation and distribution. For example, the number of resources such as boats and sandbags supplied during flooding is usually dependent on policy priorities set out in previous annual budget allocations. In addition, to fulfil the requests of disaster victims about how to obtain assistance, ERC communicators need to show transparency and need to clarify how assistance to those victims is allocated, especially in the recovery phase.

Garrett and Sobel (2003) have pointed out that in the US, states with national political significance in elections (swing states) have greater potential to receive disaster declarations than other states. This can result in different timeframes for getting help to disaster victims. Following on from this disparity in treatment, the public's perceptions that politicians have mismanaged a crisis such as focusing on reputation considerations than the public safety, may cause attempts to apportion blame, especially on social media channels (Olsson, Nord, & Falkheimer, 2015), which Heath (2010) has noted that "crisis in the political context includes having persons engaging in conflicts of interest and acts of governmental officials based on selfish interest (versus the public interest) and lies and highly biased framing of facts, values, policies, and identifications" (p. 2). The work of Marks and Rebel (2016) also points out that political polarisation can hinder

policy consistency. For example, the 2011 floods in Thailand revealed a fragmented policy in responding to the event between national policy leaders and the Bangkok Metropolitan Administration (BMA), because the leaders at these two different levels were under different political parties and had different policies in dealing with floods. This situation resulted in unfairly inundated areas between Bangkok and peripheral cities.

According to Kingdon (1995), policy is divided by its characteristics into three categories: 1) the politics stream, stemming from politics and public opinion; 2) the policy stream, driven by possible solutions to problems; and 3) the problem stream, comprised of a problem's attributes. These streams can be used to change policy if two or more streams intersect with each other. For example, the 9/11 terrorist attack and H5N1 epidemic in the US gained public attention and triggered a change in emergency management policy, including ERC in the jurisdictions where the events occurred (Bubeck et al., 2012; Veil et al., 2008). Therefore, in terms of managerial issues, disasters can be both negative and positive, depending on how risk managers deal with risks and learnings.

Underpinning plans and guidance documents

Planning and law are usually involved with managerial issues, which are seen as one of the core principles for effective ERC implementation (The National Oceanic and Atmospheric Administration, 2016; World Health Organization, 2008). These factors can undermine the effectiveness of ERC. For example, a problem stemming from a lack of ERC planning may cause involved agencies to be overwhelmed in a time of crisis, which may affect the holistic approach of response agencies. Furthermore, lack of clarity in ERC legislation can result in duplicate government agencies and may lead to conflict or inconsistent implementation.

Reynolds and Seeger (2014) have suggested that, in the initial event stage, ERC communicators should use different strategies as part of their plan: acknowledging the crisis with empathy; explaining themselves and their actions by using clear, simple factual language; establishing a spokesperson; reassuring stakeholders; and providing emergency knowledge are all essential strategies. Subsequently, in the maintenance stage, communicators should continue the communication by using other strategies such as providing necessary background information to the public; listening to public feedback; correcting misinformation; and empowering local people with the ability to participate in the decision-making process (Reynolds & Seeger, 2014). For example, communicators may encourage local stakeholders to participate in public opinion meetings during ERC planning to offer their thoughts about how to manage a hazardous event, what issues to address and what options for resolving the event exist. Such participation of local people, combined with local resources and local wisdom, can entail a proactive ERC response because such involvement can reflect the problems local communities face precisely and can result in increasingly effective resolutions to these problems.

It has been noted that ERC in the recovery phase of a crisis is often overlooked (Sheppard et al., 2012b). Importantly, in the recovery phase, communicators need to communicate with their target audiences and need to provide guidance to help build community resilience (Sheppard et al., 2012b). Effective ERC in this phase fosters recovery, alleviates adverse secondary impacts and ensures that the process of crisis recovery cannot create or

replicate vulnerabilities (Sheppard et al., 2012b); these goals must be clarified before a crisis and must be illustrated clearly in planning and guidance documents. So, they can become the applicability reality in the hazardous events.

Basic communication training and guidance is also important; some academic authors have been critical and have stated that training of responders in many regions is likely to focus on media training and may underestimate other important aspects, such as communicating with children and co-understanding between agencies (MacDonagh et al., 2016). Therefore, ERC training is needed to emphasise the importance of stakeholders other than the media. One good practice that could become a part of ERC training is the use of 'action cards', which simultaneous core actions in a crisis and desired outcomes to react appropriately during a disaster (MacDonagh et al., 2016). Such training methods can lead to a well-functioning, well-coordinated emergency response centre and can improve the effectiveness of communications to the public (MacDonagh et al., 2016).

2.2.3 The Stakeholder Factor

As there are many stakeholder engagement in ERC such as government agencies and local communities, it is noteworthy that risk communicators are required to tailor ERC messages for different audiences across different stages of a crisis and are also required to consider the accessibility of ERC, especially for vulnerable groups. This because such groups often face the most difficulty of coping with and recovering from the hazardous events (IFRC, 2016).

Addressing risk messages

Cole and Fellows (2008) have stated that ethnicity, class, gender, and similar demographic characteristics of audiences need to be considered to formulate ERC messages. Stakeholders in ERC can be divided into individuals or groups who can affect event outcomes or who can be affected by disaster events, and different stakeholder groups may have different expectations, priorities, and risk acceptance values.

In general, the main stakeholders involved in ERC include government agencies, non-governmental organisations (NGOs), local communities and vulnerable groups. Coombs (2010) has stated that the way stakeholders obtain, perceive and experience a situation can cause a hazardous event to become a crisis. Therefore, stating openly that uncertainty exists and seeking alliances with stakeholders are critical in ERC to avoid the trap of people's too-high expectations of risk manager's capabilities.

Government agencies are usually involved in conveying ERC messages; they use a top-down style such as producing guidelines, brochures, media campaigns and online networks (Fekete, 2012). Therefore, it could be said that government sector organisations are the main source of ERC in most countries. Such organisations are often heavily dependent on government policy, legislation, allocation of budgets and are impacted by limitations to human resources, which may lead to difficulties in effectively implementing ERC.

Regarding managerial issues, a legal position for coordinating crisis response is commonly defined in many countries (MacDonagh et al., 2016), which may raise public expectations to see political leaders play pivotal roles in dealing with crises. Examples of such

expectations can be taken from government responses to it: the political coordination scheme COBRA (Cabinet Office Briefing Rooms) in the UK and the Government Crisis Management Team in Poland, which have been formed specifically to provide reassurance to the public (MacDonagh et al., 2016). The formation of such bodies partially addresses and mitigates the potentially negative impacts of misguided policy, inadequate budgets, and limitations to human resources.

Another crucial ERC stakeholder is the local community, which is a key resource in DRM. This is because local communities are key actors as well as primary beneficiaries of DRM. In fact, the local community can provide better support for vulnerable groups in disaster situations if risk managers can empower community participation in disaster risk management processes (Yodmani, 2001). A good example of an ERC community-based exercise empowering local involvement is a pre-event evacuation drill based in a community. Indeed, local people often know the way to safe areas better than outsiders. If communicators can provide good ERC support and training or can include local knowledge within ERC plans, these actions can enhance their capacity to deal with crises in many local areas.

Considering vulnerable groups

Vulnerability has been defined by UNISDR (2009) as “the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard” (p. 30), whereas Blaikie, Cannon, Davis, and Wisner (1994) have stated that vulnerability refers to “a combination of characteristics of a person or group, expressed in relation to hazard exposure, which derives from the social and economic condition of the individual, family, or community concerned” (p. 11). Those groups who are particularly vulnerable may change depending on the nature of the disaster. Thus, vulnerable groups clearly need to be taken into account, including the need for particular message crafting or distribution mechanisms to reach them.

Risk information messages may vary by channel and in their characteristics. For example, mass media warnings have the potential to be very detailed in terms of content, and phone messages can be tailored to an individual, while sirens can only alert people within hearing distance to the existence of an emergency and are not specific (Mayhorn & McLaughlin, 2014). In addition, people with a disability, such as those who are deaf, require messages to be conveyed by visual media, whereas people who live in remote areas may need to access information by radio.

Heath (2010) has observed that traditionally, ERC often focuses on the organisation’s actions throughout the crisis and has overlooked the victim’s perspective. This means that the possibility of alternative choices that meet the needs of victims usually depends on organisational perspectives about what action to take. These actions are usually based on an organisation’s interest, rather the suffering of the victims. A well-known example is the case of the 2011 accident at the Fukushima Nuclear Daiichi Nuclear Power Plant in Japan, which showcased the failure of the Tokyo Electric Power Company (TEPCO) to address people’s concerns and perspectives about radiation risks (Sato, 2015).

In regard to ERC, Haer et al. (2016) have explained that a key factor in DRM is the need for people-centred risk communication, which attempts to address the specific needs of different groups, as opposed to a one-size-fits-all government campaign. Such people-centred communication can inform groups and individuals on risks and can enable them to identify possible solutions themselves (Haer et al., 2016). This approach constitutes a good ERC practice as it can better reach marginalised populations than the more traditional, top-down, and one-size-fits-all approach.

In relation to young people, localised and web-based approaches are both widely used as good practices in many countries, which are known as 'child-friendly' (MacDonagh et al., 2016). An example of such a good practice in ERC is the Max und Flocke campaign in Germany, in which a school visit strategy is used by emergency service agencies such as the Red Cross (MacDonagh et al., 2016). This good practice instils a safety message in the school children and shapes the positive image of the visiting agencies.

2.2.4 Risk Analysis Factors

As part of the ERC risk analysis, there are two predominant good practices in the field of ERC to consider: 1) simplifying technical terms when communicating about risks and options to reduce potential impacts; and 2) evaluating risk communications and tailoring lessons learnt to relevant, specific stakeholder groups.

Simplifying technical terms

Risk assessments, early warning processes and risk information dissemination are recognised as crucial aspects of ERC and disaster management. Effective ERC involves both crisis detection and risk assessment to create precise information and action guidelines with which to mitigate the destructiveness of disasters (Covello, 2003; Reynolds & Seeger, 2005).

Communities can be involved in assessing risks by using tools such as the review of secondary data, direct observation, and community drills (the Asian Disaster Preparedness Center [ADPC], 2016). These tools can be used to highlight the ways in which communities learn from disaster events and apply what they have learnt in subsequent events and ultimately lead to better solutions for those communities.

In addition, people carrying out ERC assessments such as drills and direct observations should identify the main concepts of simplicity, time, accuracy, relevance, credibility and consistency before conveying real risk messages (Shufutinsky et al., 2014). Specifically, warning messages need to explain the expected events and the potential effects on people; they also need to translate expert information into clear and simple facts (Mileti & Peek, 2000), especially suggestions about what the public should do to protect themselves (Lindell & Perry, 2004). Furthermore, Mileti and Peek (2000) have suggested that in order to write and deliver warning messages, risk managers should consider five key criteria: 1) the hazard, 2) its location, 3) relevant guidance, 4) time available to respond, and 5) the source of the message.

Furthermore, technical forecasting and monitoring agencies should address the need for providing information to remove ambiguity and to make messages easy for non-experts to understand (MacDonagh et al., 2016). One good example of such information-friendly practices

is The UK's Natural Hazards Partnership, which comprises more than ten technical agencies and five government departments to analysis data and publish daily hazard forecasts in a reader-friendly manner (MacDonagh et al., 2016).

Applying lessons learnt

The failure or success of each ERC campaign can lead to better options for dealing with disasters. An example of good practices in applying lessons learnt is the allowance of stakeholders to play the role of local or responder hero, which can garner media attention and can provide a chance for organisations to repair their own images as rescuers (MacDonagh et al., 2016). Moreover, collective lessons learnt can be useful for improving interagency coordination. This is because practitioners can learn from a real event; specifically, they can learn what they should or should not do, as well what the future challenges are to improving coordination in order to upgrade agency competencies.

2.2.5 The Communication Channel Factor

In regard to the communication channel factor, there are two important good practices in ERC to consider. These good practices entail using various forms of language to communicate such as verbal, written and visual language. They also entail providing ongoing communication and using multiple channels, including social media such as Twitter and Facebook.

Using multiple forms of communication

The media is a crucial resource to help and support DRM (Kelay & Fife-Schaw, 2010). Communicators need the media to reduce uncertainty and to make sense of what has happened to their target audiences (Reynolds & Seeger, 2005). For example, in the case of volunteers, the media is needed to clarify what has happened and to explain how the victim will be helped, rather than ignoring the media and having would-be helpers rush to the scene of a hazard.

O'Neill (2004) has stated that different messages are crucially needed at different stages of the ERC cycle. Furthermore, Coombs (2007) has emphasised that crisis communication needs to be an ongoing process throughout the pre-crisis stage, the crisis situation and in the aftermath of the crisis. The need for effective communication channels arises from the geographical space between stakeholders, and information therefore needs to be transferred regularly. In the initial state of emergency, 'warning channels' refer to the communications media used to disseminate disaster information. Lindell and Perry (1987) have claimed that these channels may include face-to-face contact, telephone calls, newspapers, TV, and the Internet. Each of these channels varies in terms of the precision of dissemination and in the specific way the message is delivered, which may or may not be appropriate for the intended audiences.

In the response phase, ERC is about taking action immediately to save lives and property (Sheppard et al., 2012a). Government agencies, emergency-related organisations and the general public are required to collaborate to respond to the crises. In addition, public leaders such as the BMA Governor can use social media as a powerful medium to communicate with other stakeholders, because social media can engage the public widely (Sheppard et al., 2012a); furthermore, social media channels are convenient to use, regardless of the time and place

concerned. For example, during the 2011 flood in Thailand, many networks used Facebook to identify locations and to help flood victims, and responders also used YouTube to acknowledge people's queries and to discuss how to deal with the flood.

Using multiple channels and social media

Traditional media channels such as TV, radio, newspaper, phone, and facsimile are often the primary tools to disseminate disaster-related information, including ERC. Television (TV) news is also one of the most popular mediums for crisis communications. The prominent qualification of TV is its real-time updating capability. Nowadays, social media plays an increasingly important role in public relations and information dissemination, as it is easy to access and spreads the word quickly. However, social media posts can facilitate inaccurate information and rumour spread, which means posts should be treated with caution and considered carefully before sharing certain content (ADPC, 2013). Indeed, in traditional media such as TV and radio and in modern media such as websites and blogs, the news items that attract the most attention are often controversial stories, social conflicts and scandals, which may lead to bias in risk reports, both in the media item itself and in public perceptions of ERC messages (V. T. Covello et al., 2001). Therefore, risk managers also need to address these issues.

A warning source is crucial to agencies responsible for hazard communication, which includes government authorities, media, or peers such as friends and colleagues (Lindell & Perry, 2004). One fundamental ERC good practice is to use mobile applications to provide early warnings of imminent or ongoing disasters, which is beneficial in disseminating accurate situation assessments, instructions and advice (MacDonagh et al., 2016). Many ERC agencies also use landlines to provide information or to answer people's inquiries. The best example of such a practice is the use of a helpline by the Swedish Civil Contingencies Agency (MSB) to respond to an outbreak of the swine flu (MacDonagh et al., 2016).

Social media channels are crucial tools for getting ERC messages to the public quickly and in a unique, understandable format (Liu, Fraustino, & Jin, 2015). Using online networks, the public can obtain and share information easily (Chung, Nam, & Stefanone, 2012). MacDonagh et al. (2016) have noted that websites are now widely used to provide basic information about risks, and their use is growing substantially. Furthermore, social media and smartphone applications (apps) are commonly used for monitoring a disaster, and risk communicators can use many channels to complement the needs of various audiences. An example of such practices is the US Federal Emergency Management Agency (FEMA) app called "Disaster Reporter", which allows users to be geo-tagged and to send images to report on the event situation (MacDonagh et al., 2016). Twitter is also used for collecting pictures or videos from the hazardous location (MacDonagh et al., 2016).

In using so many ERC channels, risk managers need to consider which sources are credible (Reynolds & Seeger, 2014; The National Oceanic and Atmospheric Administration, 2016). Risk managers also need to communicate directly in some disaster contexts, such as finding vulnerable individuals who cannot hear or who ignore an evacuation warning (MacDonagh et al., 2016). An example of this ERC best practice is the case of the City of Prague during flooding in 2013, in which event managers used cars with loudspeakers to warn about hazard

areas; they also used direct methods such as posting evacuation times and notices on doors and door-knocking (MacDonagh et al., 2016).

Risk communicators also need to consider potential barriers to communication (Lunenburg, 2010), which can retard or distort messages and may result in the failure of the ERC process. Failures can be due to biased perceptions, cultural differences, and ambiguities inherent in the actual messages. Therefore, risk communicators need to consider using multiple media channels to communicate to different groups who use these channels the most. For example, elderly people usually watch TV, and people with disabilities may need special media sources to communicate such as sign language on TV, braille posters on doors and sign language videos on YouTube.

2.3 Chapter Summary

In chapter 2, existing literature on ERC has been discussed and reviewed. I have drawn ideas from key definitions of risk and crisis communication and have justified the importance of ERC. I have also identified general criteria inherent in good ERC practices. In the second half of the chapter, based on the review of existing literature on ERC in relation to good practice criteria, I further investigated and illustrated additional insights into key influential factors affecting ERC, including managerial, stakeholder, risk analysis, communication channel and cultural issues. In chapter 3, I outline methodological approaches used in the current study to address gaps in knowledge and barriers to effective ERC identified in the literature review. I also discuss ethical considerations.

Chapter Three

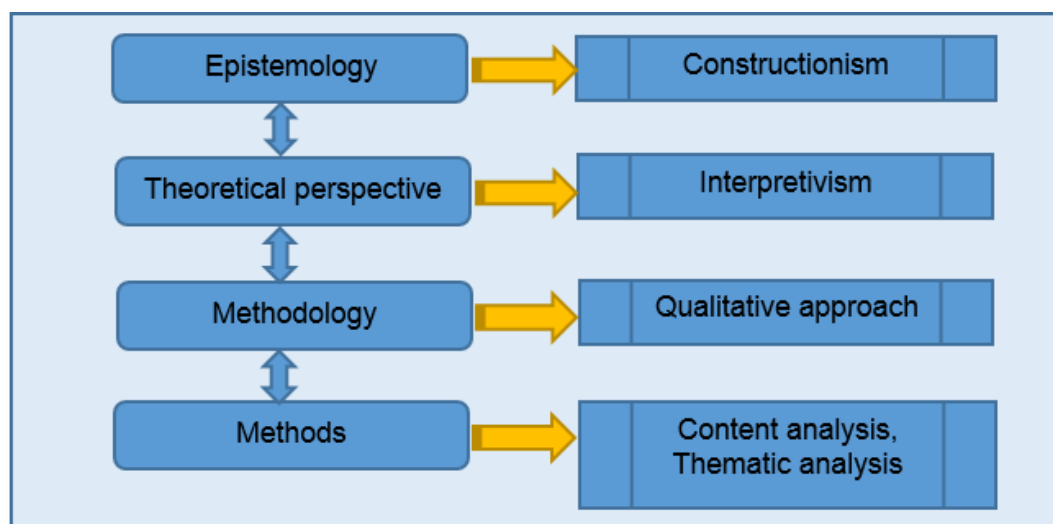
Methodology

This chapter details the methodological approach used to address the three stated objectives of the study, which are to: 1) review existing good practices in ERC globally; 2) review existing good practices and gaps in ERC in Thailand against the developed framework; 3) identify the challenges and opportunities to fill current ERC gaps and to implement improved best practices in Thailand. Chapter 3 is divided into three sections: in sections 1 and 2, I outline the methodological approach employed and provide a rationale for such an approach, and in sections 3, I discuss potential ethical issues associated with the research.

3.1 Research Epistemology and Theoretical Perspectives

In this dissertation, I aim to evaluate and to understand good practices in ERC in order to develop good ERC practices for use in Thailand. In an attempt to address the research topic, which is to critically review current ERC practices in Thailand and subsequently analysis how to improve these practices through incorporating key components of better ERC practices, the current study is based on a research framework developed by Crotty (1998), which has identified four key elements essential to research of this type (Figure 4).

Figure 4. The methodology framework used for this dissertation.



Source: Adapted from Crotty, 1998.

As shown in Figure 4, this framework comprises epistemology, theoretical perspectives, methodology and specific methods that support overall methodology. These elements are interconnected and inform one another. Crotty (1998) has defined epistemology as “a way of understanding and explaining how we know what we know” (p. 3), whereas Dawson (2002) has proposed that epistemology refers to the study of knowledge and its rationale in order to distinguish between the truth and belief. The epistemological stance of this study is one of constructionism, which describes reality as socially constructed (Schwandt, 2000). Crotty (1998)

has posited that from this perspective, people tend to attach meanings to the same event in different ways. Using this epistemology (constructionism), scholars can engage with the good ERC practices debate to understand ERC fully and to construct a reality based on the different perspective evident in different good practice literature.

The theoretical perspective of this study is interpretivism, which focuses on understanding the meaning of the social situation from the perspective of people who live it (Schwandt, 2000). This means the inquirer needs to interpret phenomena and to understand meanings through a process that reveals what intentions lie behind people's actions. In support of interpretivism as a research perspective, Rubin and Rubin (1995) have stated that there is no one truth in our social world and that researchers should interpret issues as having different social meanings. From the data analysis in the current study, I aim to serve the overall purpose of the research, which is to identify good practices and gaps in ERC for Thailand, via the process of interpretation. Taken together, the above-mentioned published authors' insights mean that when a researcher begins to do research, he/she should underpin the work with theoretical perspectives; the research design, methodology or framework should be based on a philosophical stance in order to understand and to explain the research question. Therefore, in the present study, I use constructionism as my epistemology and interpretivism as a theoretical perspective.

3.2 Methodological Processes

For the present project, I chose qualitative content analysis in order to evaluate and to understand identified good practices such as ERC guidance, reports, and ERC academic publications. Using content analysis also helps to minimise bias and to ensure consistency in coding data (Bryman, 2008), which is an appropriate methodology when evaluating and justifying good practices in ERC. In addition, a detailed assessment of guidance documents and/or current ERC practices can be used to capture and analyse the prominent factors or imperative issues related to risk communication in order to propose ERC good practices strategies for ERC in Thailand.

The steps involved in conducting a qualitative content analytic study vary slightly between authors. For the current study, I chose to use the process outlined in the work of White and Marsh (White & Marsh, 2006), which is set out below.

3.2.1 Identification of appropriate information and data collection

In order to answer the research question and to propose ERC good practices strategies for ERC in Thailand, it is essential to understand why good practices in ERC differ from country to country. This process can help to identify the key factors that are common to good ERC practices worldwide. To conduct the review of ERC literature, a scholar also needs to understand the relative importance of those good practices, especially as they relate to how ERC can make disaster management effective for the people involved.

The ERC literature review was conducted of academic publications, practical guidance, lessons learnt and reports dealing with ERC. Targeted searches according to ERC were performed for documents from specific institutions, such as FEMA and DDPM. The academic search engine and databases also used for this study included Google Scholar, Scopus, and

AUT library search. Based on the literature review, which describes ERC theories, models, and practical guidance documents for identifying the pivotal factors inherent in current ERC practices, I have developed a framework of key principles underpinning good practices in ERC that considers cultural, managerial, stakeholder, risk analysis and communication channel factors. By using this framework, I seek to identify gaps and good ERC practices in Thailand. Documents I have analysed, including grey literature, were limited to those published during the 10-year period from 2007 to 2016, because ERC in Thailand has developed apace since legislation, i.e., the Disaster Prevention and Mitigation Act, was introduced and enforced in B. E. 2550 (2007).

I have selected good ERC practices used in disaster management in many developed countries such as the US, the UK and Japan for study because these countries have made crucial advances in ERC research since the 1990s (Sheppard et al., 2012a). In addition, using research conducted in these countries has allowed me access to ERC-relevant documents written in English, which has been useful when comparing practices between Thailand and other countries (Elo & Kyngäs, 2008). The comparison process has involved data pertaining to five key criteria including cultural, managerial, stakeholder, risk analysis, and communication channel as detailed in chapter 2. I have also used ERC key term searching for academic publications, guidance, and ERC reports for the content analysis, including policy documents from governments, best practice guidelines, lessons learnt and international and Thai organisational reports on best practices. Subsequently, I have scrutinised content to identify and to list good practices according to criteria previously defined in chapter 2 (Table 4).

Table 4

Selected Articles and Criteria Related to ERC

Key criteria	Focus
Cultural factors	<ul style="list-style-type: none"> ✚ Understanding risk perception ✚ Cultural considerations ✚ Building trust
Managerial issues	<ul style="list-style-type: none"> ✚ Clarifying objectives ✚ Underpinning plan and guidance documents
Stakeholders	<ul style="list-style-type: none"> ✚ Addressing risk messages ✚ Considering vulnerable groups
Risk analysis	<ul style="list-style-type: none"> ✚ Simplifying technical terms ✚ Providing lessons learnt
Communication channels	<ul style="list-style-type: none"> ✚ Using multiple form of language and ongoing communication ✚ Using multiple channels including social media

Abbreviation: ERC, emergency risk communication.

3.2.2 Coding the data and checking for reliability

In the current study, coding categories were not derived from data but were based on a prior understanding of ERC knowledge and on themes derived from the literature review. Deductive coding was used according to previously developed framework to investigate each key criteria. The information has been coded based on preconceived categories, which included the five components of ERC; cultural, managerial, stakeholder, risk analysis, and communication channel. These five components were then further subdivided into 11 subdivisions of good practices in ERC, which are 1) understanding risk perception, 2) cultural considerations, 3) building trust, 4) clarifying purpose and objectives, 5) underpinning plans and guidance documents, 6) addressing risk messages, 7) considering vulnerable group, 8) simplifying technical terms, 9) applying lessons learnt, 10) using multiple forms of communication, and 11) using multiple channels and social media. In order to ensure the trustworthiness of coding, a generous margin of time was devoted to verifying credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). A number of ERC documents were analysed to identify the suitability of the framework categories and to categorise the information to better address the research topic: to critically review current ERC practices in Thailand and to analyse how to improve these through applying globally-derived best practices.

3.2.3 Analysing the data

After the data were compiled, I then analysed a number of documents and coded information in relation to the research question into five criteria, which I derived from the literature review, as described in the “Identified best practices for effective ERC” section, chapter 2. For the current study, I used content analysis to examine the study topic from different angles and identified patterns derived from the content analysis and categorised them according to themes or key criteria. Then, I used thematic analysis as “a method for identifying, analysing and reporting patterns within data” (Braun & Clarke, 2006, p. 79) to further analyse the content of these coding schemes, because the methodology suited my research topic well with its broad range of theoretical frameworks, including the constructivist approach. The data analysis followed six thematic steps (Braun & Clarke, 2006; Khunwishit & McEntire, 2011): 1) familiarisation with the data and identification of emerging ideas; 2) generation of codes from the data; 3) a search for potential themes; 4) the generation of codes; 5) a check for relationships among themes; and 6) the writing of the report.

Key themes related to good ERC practices were identified, analysed and integrated to propose ERC good practices strategies in order to achieve research objective three: identifying challenges and opportunities to enhance ERC and to implement best practices in Thailand. The key themes or criteria are set out in Table 5.

Table 5*Criteria Related to ERC and Their Rationale*

Key criteria	Rationale
Cultural factors	Cultural factors such as risk perception, trust and other cultural considerations were analysed to identify the challenges to ERC implementation
Managerial issues	Policy, legislation, and planning for ERC were analysed to identify a national strategy to deal with disasters
Stakeholders	Stakeholder engagement in ERC within government agencies and local communities was analysed to investigate roles and responsibilities in ERC
Risk analysis	Risk analysis factors were analysed to identify communication messages framed to meet audiences' disparate needs and to simplify technical terms, whereas lessons learnt were analysed to improve ERC messages' effectiveness
Communication channel	Communication channels were analysed to evaluate the effectiveness of ERC and to recognise barriers to communication

Abbreviation: ERC, emergency risk communication.

3.3 Ethics

Ethical approval was not required for the current study because there were no subjects, human or otherwise, nor any intervention conducted. The information gathered was available on public websites, which are open for public viewing and can be accessed without needing special approval or permission.

3.4 Chapter Summary

In Chapter 3, I have described the current dissertation's theoretical and methodological framework. The theoretical approach used in this study follows constructionism and interpretivism concepts. In this chapter, I have also explained my rationale in using different study methods for content and thematic analyses. The potential ethical issues associated with the study have also been discussed. The findings from the current study are presented in chapter 4.

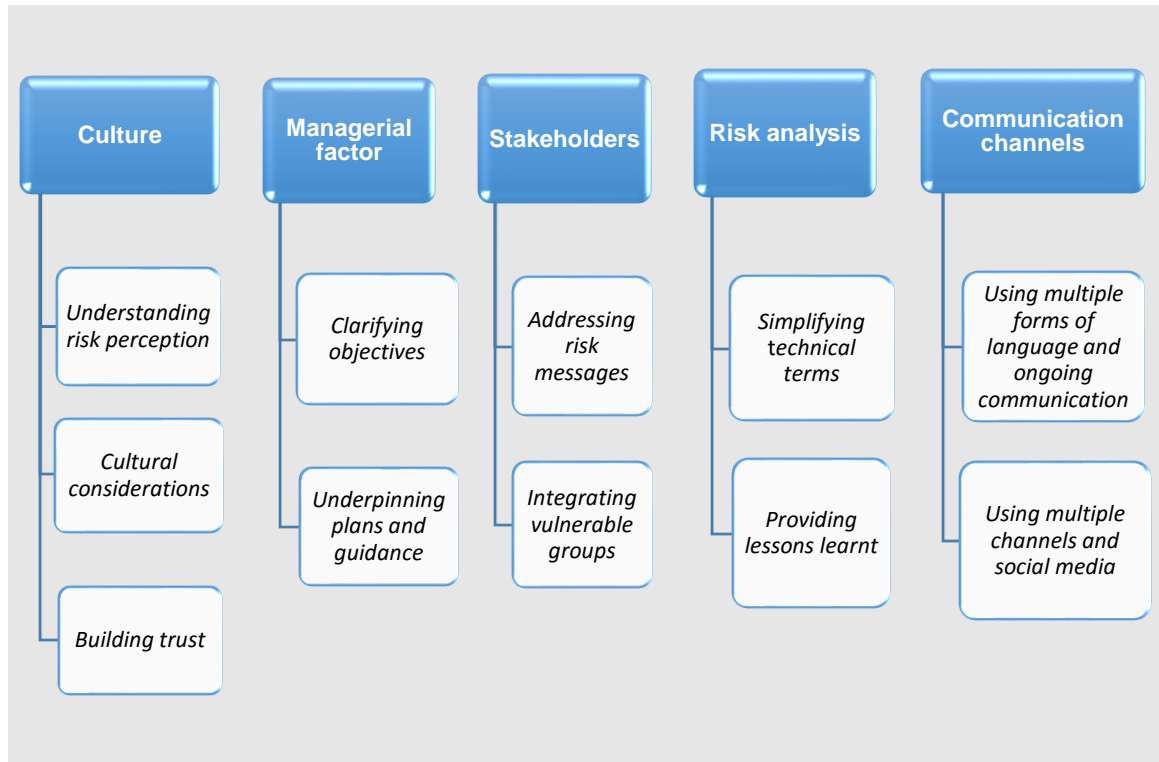
Chapter Four

Findings

In chapter 4, I present findings in relation to current gaps and good ERC practices in Thailand. I aim to address my three study objectives, which are: 1) reviewing existing good practices in ERC globally; 2) review existing gaps and good ERC practices in Thailand; and 3) identifying the challenges and opportunities to filling current ERC gaps and implementing improved best practices in Thailand. This chapter is divided into six sections related to key criteria that define good practices in the ERC framework, which was developed based on a thorough review of the existing literature. Chapter 4 starts with a section about the ERC framework, followed by a presentation of findings about key ERC components including cultural, managerial, stakeholder, risk analysis, and communication channel issues. Exploration of each component of the ERC system allows us to identify the gaps and challenges to good practices in ERC in Thailand. In chapter 4, I also outline the implications of my findings as a precursor to addressing implications in chapter 5 in detail.

4.1 Emergency Risk Communication Framework

In an attempt to identify crucial components of good practices in ERC, the present study is based on the review of ERC theory and research, as well as existing experience of good practices both in Thailand and elsewhere. A number of ERC documents were selected and then six of the ERC good practice principles documents were identified and analysed to address the research question and objectives of the study. The ERC framework developed in the current study includes five key criteria, namely, cultural, managerial, stakeholder, risk analysis and communication channel factors (Figure 5). These components affect how a framework to identify gaps and good ERC practices in Thailand is developed. In turn, addressing the gaps based on the framework may help increase effectiveness in ERC and improve disaster management capacities in Thailand.

Figure 5. The framework for identifying factors crucial for good practices in ERC.

4.2 Cultural Factors

Cultural factors are the most important part of ERC implementation in Thailand, because culture drives ERC practices, both in the short and in the long term. The way citizens take action to prepare for or to minimise risks is based on what and how they think. Therefore, in the current study, I focus on understanding risk perception, considering cultural contexts, and building trust, which are crucial elements of effective ERC.

Understanding risk perception

Prior to the Indian Ocean 2004 tsunami that killed more than 5,000 people, damaged property across the affected area and caused more than a billion US dollars in economic losses, Thai people perceived their country as a non-hazardous area (Lanard & Sandman, 2011). This attitude was partly based on the fact that Thailand has only 13 earthquake fault lines and no active volcanoes.

However, Thailand could be affected by a large volcanic eruption in a neighbouring country such as in Indonesia (DDPM, 2016), unbeknownst to many people. Another example of such low hazard unawareness can be found in the case of the Thai 2011 flooding. Many factories were affected because of buildings' locations in flood zones, perhaps a result of a lack of awareness of the flood risk (Okazumi & Nakasu, 2015). This lack of awareness implies the lack of a proper land use policy (Fakhruddin & Chivakidakarn, 2014) and a general lack of risk awareness, both of man-made and natural disasters. This cultural attitude can also be construed as the biggest gap in risk perception/awareness, which therefore needs to be addressed by ERC practitioners.

Although disaster awareness has been growing amongst the Thai population (Asian Disaster Preparedness Center, 2013), especially policy makers and public health agencies, most Thai citizens still underestimate risks and pay little attention to preventing or preparing for disasters (Khunwishit & McEntire, 2011). Hence, risk managers need to create a safety culture and educate people about disasters. One example of good practices in education and public awareness is an activity called 'National Disaster Prevention Day' (Figure 6), which aims to increase public awareness and instil a safety culture in the Thai people (Asian Disaster Reduction Center, 2009).

Figure 6. Photos of disaster prevention and mitigation planning in action show government sector and the public particularly students participated in the National Disaster Prevention Day.



Source: Asian Disaster Reduction Center (ADRC), 2009.

Another good example of shaping risk perceptions is the initiative to provide education on disaster risk reduction in schools, including storybooks to help primary school students and their communities with disaster preparedness and response (Asian Disaster Reduction Center, 2009). In addition, Thailand also has national training programmes for adults, such as trainings that help build capacity and resilience, increase people's abilities to reduce the risk of population displacement and better prepare them for disasters (Asian Disaster Preparedness Center, 2013).

Cultural considerations

Thailand's culture is a mixture of Indian, Chinese and traditional Buddhist and Muslim elements (Center for Excellence in Disaster Management and Humanitarian Assistance, 2015). The many cultures of neighbouring countries have played an important role in creating the traditions of the country. In terms of religion, Buddhists, Muslims and Christians account for 93.6%, 4.9% and 1.2% of the population, respectively (CIA-The World Factbook, 2016). Buddhist concepts are fundamental to what most Thai people believe and are rooted in their way of life.

Buddhists perceive disasters as natural events (Falk, 2010). They also believe that "all natural occurrences are accounted for in terms of the Laws of Dependent Originations" (Falk, 2010, p. 97). Therefore, everything is interconnected and has its own reason for happening, including disasters. An example of good practices in relation to Buddhism when communicating about risk can be found in the 2004 tsunami scenario. After the event, Buddhist monks played an important role in helping many of the Thai survivors, both with their basic needs and their psychological needs, by employing Buddhists to explain such a catastrophe (Falk, 2010).

However, in some area such as Yala, a province in the south of Thailand, Muslim beliefs dominate, and risk communicators need to keep this in mind when communicating in this region.

In terms of local community participation in ERC, Thomalla, Metusela, Naruchaikusol, Larsen, and Tepa (2009) have stated that the lack of critical reflection in Thai society could be a consequence of cultural differences, such as the practice of 'deliberation feedback and critique' when relating to others, which is opposite to the 'straightforward norm' in most Western countries' cultures. This means that Thai people are usually considerate towards other people and are more likely to refrain from voicing criticism openly in meetings, such as in a community's disaster management planning meeting with local government. This way of relating could cause problems for communities seeking to adapt to hi-tech innovations, such as EWS (Thomalla et al., 2009). Indigenous communities may also have the communicating problems when such communities try to adopt prevention measures from central government, which may justification as appropriated measures to the community solely in the notion of the government. Therefore, risk communicators need to encourage local people to voice their views, their priorities in ERC and their opinions about what resources could be useful in localised areas (Thomalla et al., 2009).

Building trust

Over the past decade, Thailand has weathered political conflicts, and the media has often reported on involved opponents' political party views; the turmoil has led to a problem with the single command system common to disaster management set-ups (Jongsuksomsakul, 2013). Consequently, Thai disaster administrators also have a problem at the managerial level of disaster management, in that managing disasters is more likely to be a series of isolated managerial efforts at a boundary-scale level, rather than a cooperative effort between joint agencies at different levels (Asian Disaster Preparedness Center, 2013; Kabir et al., 2011).

Furthermore, in dealing with disasters such as the 2011 flooding, there were problems such as inadequate preparedness and a lack of consistency in information being generated by relevant government agencies, because Thailand has 22 departments responsible for water management (Jongsuksomsakul, 2013). This inadequacy led to the overwhelming of affected groups and a decreasing belief in government capacity to cope with floods (Jongsuksomsakul, 2013). In addition, Lanard and Sandman (2011) have stated that the Thai government has often shown a dishonest culture in communicating about disasters. For example, in the 2011 flooding, the Thai government tried to cover up information about hazards in flood-prone areas and insisted that it could deal with flooding, despite the inundation of many houses in many areas. This outcome affected public trust in the capability of government agencies to cope with floods.

Another relationship problem is the lack of public trust in EWS due to false alarms that went uncorrected by relevant government agencies. A clear example is the case of the tsunami EWS mistake, which has caused local communities and visitors to fall back on their own knowledge and experiences of tsunamis (Thomalla et al., 2009). Damaged public trust could be a challenge for government agencies as they try to rebuild relationships.

4.3 Managerial Factors

Clarifying ERC implementation objectives

National ERC policy is considered as a main pillar for strategies and risk communication implementation processes. Emergency management in Thailand was changed after the Thai Government's administrative reforms in 2001. Disaster management policy now takes into account the 'all hazard approach', which divides disasters into three categories: 1) man-made and natural hazards; 2) disasters resulting from air raids during war; and 3) disasters resulting from sabotage or terrorist attacks (DDPM, 2016). However, in terms of disaster management practices, the new policy can be seen as a reactive policy only, which means the government issued new project mandates and enacted the new law in the aftermath of disasters, rather than with forethought (Khunwishit & McEntire, 2011). For instance, the National Disaster Warning Center (NDWC) was set up following the 2004 southern tsunami in order to enhance national EWS.

National disaster management policy in Thailand can be found in the *Eleventh National Economic and Social Development Plan B.E. 2555–2559* (2012–2016). This plan aims to balance development in Thailand, which has shifted from an economic growth-orientation to be a "people-centred development". This shift in policy is important, because it was a remarkable change from a top-down ERC policy to a more community-based methodology (Asian Disaster Preparedness Center, 2013). The overall vision is "a happy society with equity, fairness and resilience" (Asian Disaster Preparedness Center, 2013). The policy attempts to provide ways for people to develop economically with integrity, knowledge and skills, and to secure natural resources and a solid environmental base by supporting community participation and by improving resilience in the face of climate change and natural hazards (Asian Disaster Preparedness Center, 2013). This means that disaster management, including ERC, has now become a crucial aspect in the Thai Government's economic development policies.

Complementing the national development plan, the National Disaster Prevention and Mitigation Committee (NDPMC) is a national-level, multi-sectoral committee responsible for policy formulation and planning for disaster management in Thailand. The Prime Minister or the Deputy Prime Minister can be appointed as a chairman of the NDPMC, which includes representatives from government organisations and qualified persons appointed by the Cabinet (Kabir et al., 2011). This means that at the national disaster management level, disaster management is an imperative policy document for politicians, who can foster the ratification of relevant ERC laws, drive engagement planning and allocate budgets.

As far as leadership goes, however, the discontinuity evident in the Thai Government can obstruct the ongoing development of effective emergency management and ERC. This is because ever-changing government committees usually encourage changing public personnel (high staff turnover of public servants), especially those positioned in top-management levels, which can hinder the implementation of the nation's emergency management policies and ERC (Asian Disaster Preparedness Center, 2013).

In accordance with the legislation dealing with ERC in Thailand, the *Disaster Prevention and Mitigation Act 2007* (DPM Act 2007, B.E. 2550) is the defining document for disaster management. This act has been designated to the DDPM as the focal agency to formulate

disaster management activities in Thailand. The law (act) also describes and clarifies disaster management processes, policies and ERC procedures from national to local levels (DDPM, 2016). Overall, the DPM Act 2007 has five important features it supports (Kabir et al., 2011): 1) the scope of disaster management activities covers all types of disasters; 2) the act designates the NDPMC to write policy for the *National Disaster Prevention and Mitigation Plan* 2010–2014 (NDPMP 2010–2014); 3) the act designates the DPPM as the national agency in control of disaster management; 4) the formulation of all disaster prevention and mitigation plans (national, provincial and Bangkok Metropolitan) are based on the act; and 5) the act clarifies authorities and disaster management activities at all levels.

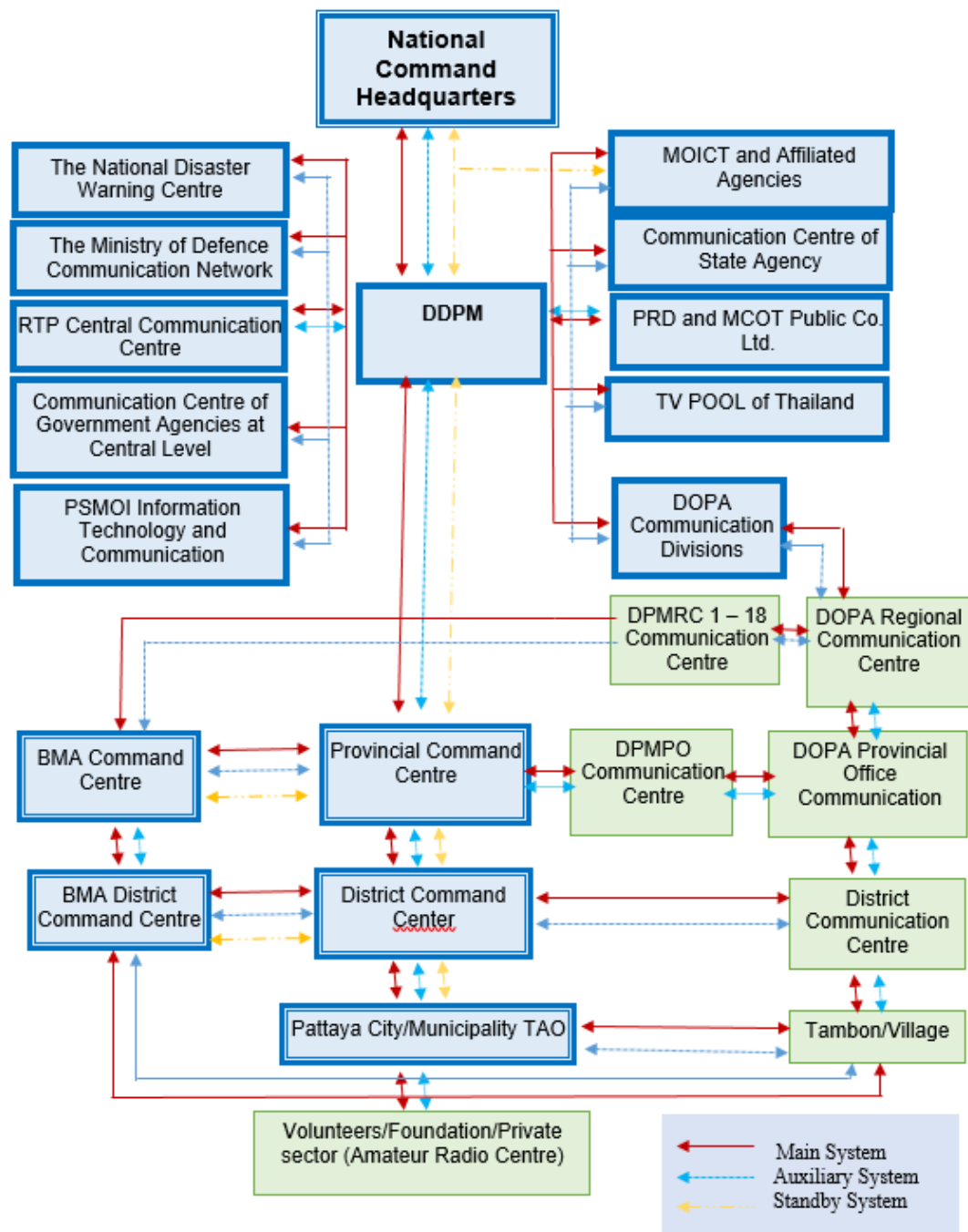
However, the act also has some weaknesses. Although it focuses on disaster management practices at the provincial level, it does not support a regional response approach, and in fact, it supports the problematic idea of coordination between regions to deal with a large-scale disaster (Kabir et al., 2011). These weaknesses are potential gaps in ERC implementation, which are based on imperfect legislative support.

Underpinning plans and guidance documents

The NDPMP 2010–2014 and the *Strategic National Action Plan* (SNAP) are other critical national-level plans regulating disaster management (Asian Disaster Preparedness Center, 2013). The disaster management system in Thailand, including ERC practices, can be classified into four levels of disaster management. At the top level, the NDPMC leads disaster response efforts under the aegis of the Director General of the DDPM as the Secretariat. At the second, strategic level, the DDPM follows the national committee on policy and implementation. At the third level, also a strategic function, the 76 provinces are led by provincial governors. Lastly, at the fourth operational level, the provinces and local governments are mandated to undertake disaster response and ERC within their jurisdictions. In addition, the NDPMP also describes criteria to be considered for scaling up disasters to higher levels, and these criteria vary according to population, management capacity and available resources.

The NDPMP 2010–2014 is a national guideline, which requires the Bureau of the Budget, related agencies and local governments to provide disaster prevention and mitigation measures when allocating disaster management budgets, especially in order to help affected people and communities (Khunwishit & McEntire, 2011). This plan is also briefly described in ERC parlance as the “Disaster Management Communication System” (Figure 7), which names the National Command Headquarters as the top command post and the DDPM as a coordination centre for public agencies and other relevant sectors such as volunteers and charitable foundations.

Figure 7. Disaster management communication system chart.



Abbreviation: DDPM, Department of Disaster Prevention and Mitigation; RTP, Royal Thai Police; MOI, Ministry of Interior; MOICT, Ministry of Information and Communication Technology; PRD, Public Relations Department; MCOT, Mass Communication Organisation of Thailand; DOPA, Department of Provincial Administration; BMA, Bangkok Metropolitan Administration; DPMPO, Disaster Prevention and Mitigation Provincial Office; TAO, Tambon Administration Organisation.

Source: Adapted from the Thai *National Disaster Prevention and Mitigation Plan 2010–2014* (NDPMP 2010–2014).

Despite the fact that provincial-level agencies are likely to be the active agencies in dealing with disasters and the practical aspects of ERC, the 2007 DPM Act and the NDPMP 2010–2014 specify Tambon administrative organisations (TAOs), which are below district (Amphoe) and provincial (Changwat) agencies, as the primary agencies responsible for community disaster management, and thus, most DDPM funding is allocated to TAOs, including the decision-making authority to utilise these funds (Thomalla et al., 2009). This could imply the need to coach TAOs as the leading active local agencies so they can integrate and coordinate roles and responsibilities for making disaster management and ERC more efficient.

Moreover, although the DPM Act 2007 and the *Ministry of Information and Communication Technology Act 2001* (MICT Act 2001) have authorised the DDPM and the MICT to implement ERC and to coordinate across agencies, it does not provide specific ERC legal support nor an action plan or guidelines for implementing ERC in Thailand. This is partly because these two main agencies must implement ERC initiatives under the control of two different superior ministries (the MICT and the MOI), which focus on different objectives and different laws (Asian Disaster Preparedness Center, 2013). This situation implies that there is a need for developing ERC policy and planning to enhance a holistic improvement of disaster management in Thailand.

4.4 Stakeholder Factors

To strengthen the ERC system in Thailand, the main task involved in the current study was to identify all relevant stakeholders involved in the generation, dissemination, and evaluation of emergency risk information. The key stakeholders I have identified include relevant government agencies, NGOs, and community and vulnerable groups, particularly from hazard-prone areas, who can provide a local perspective to the ERC process.

Addressing risk messages

In accordance with government agencies and NGOs, in Thailand, the DDPM is a major organisation in charge of disaster management including ERC; however, other public organisations are also significantly involved in dealing with disasters. This is because the DPM Act 2007 and the NDPMP 2010–2014 mandate all ministries to include emergency-related programmes as their inter-agency joint key performance indicators (Khunwishit & McEntire, 2011). For example, during and after the tsunami in 2004, the Prime Minister assigned each minister to direct, command and cope with the problems related the incident in one area; for example, Phuket Province was under the responsibility of the Minister of Interior, whereas Phang-Nga Province was the responsibility of the Minister of Natural Resource and Environment. In addition, there were 393 separate organisations involved in the response network including members of the public, NGOs and the business sector, which all needed to have a coherent and consistent ERC strategy to work with in order to collaborate across actors effectively (Khunwishit & McEntire, 2011).

As noted, NGOs are also actively engaged in major emergencies. The list includes the Thai Red Cross, the Rajaprajanugroh Foundation, the Princess Pa Foundation and the Ruamkatunyu Foundation (Khunwishit & McEntire, 2011). However, Thailand lacks strong NGO

networks (Asian Development Bank, 2011). In order to share information and to collaborate, such networks rely on informal and one-off communications (Asian Disaster Preparedness Center, 2013). Unfortunately, the increasing involvement of private, business and NGOs complicates disaster management coordination. The Thai Government may therefore need to integrate ERC into these national-level agencies to provide a single, coherent plan that all of them can follow.

In relation to volunteers, the MOI has instructed the DDPM to train at least 2% of the Thai people to be volunteers in disaster preparedness and to form active groups such as search and rescue teams, which is a well-known good practice in Thailand (Thomalla et al., 2009). However, it is noteworthy that apart from government-established volunteer groups, there are also many spontaneous volunteer groups that form during hazardous events, such as in the 2011 flood in Thailand (Asian Disaster Preparedness Center, 2013). During the 2011 flood event, these groups of volunteers helped to support the victims in many respects (Kabir et al., 2011). For instance, they created a group on social media to inform government agencies about affected people or areas that needed assistance, and they also helped to emotionally support affected people by creating activities in disaster shelters. It is clear that these volunteer groups are still required to strengthen the overall network and that they, in turn, require support such as awards and recognition for their good works (Kabir et al., 2011).

In rural communities, when disaster strikes in an impoverished area, unawareness of disaster and lack of knowledge about how to deal with disaster have exacerbated the effects of disasters on vulnerable people (Yodmani, 2001). The lack of consistent ERC and coordination in rural communities, such as between groups of people who live on the border between two villages between a protected zone and a flooded area, may cause conflict between communities and local government (Khunwishit & McEntire, 2011). In addition, the lack of communication between different rural stakeholders may also result in insufficient effort or duplication in distributing relief items (Asian Disaster Preparedness Center, 2013); for instance, some poorer districts may receive more aid if they are supported by politicians looking for votes (Asian Disaster Preparedness Center, 2013). This could simply the need for coordination and collaboration between neighbouring hazard-prone areas to realise better outcomes when tackling future disaster events (Asian Disaster Preparedness Center, 2013).

Integrating vulnerable groups

Thailand has many vulnerable people, such as those living at a low socio-economic level, people with disabilities, the elderly, woman and children (Asian Disaster Preparedness Center, 2013). In the group of people with disabilities, the problem of ERC is the inaccessibility of communication warning channels to support their decision making in times of crises, particularly the inaccessibility of information about assistance agencies. This has led them to trust information from friends rather than government agencies or alternative media (Asian Disaster Preparedness Center, 2013). For example, in the Thai flood of 2011, such groups had to rely on their friends and families to access information about risks and prevention measures. Thus, risk communicators need to provide a communication medium that will work for people with disabilities.

For the elderly, there is potential for them to suffer age-related issues such as poor mobility and poor health; they need special attention in disaster situations. During the flooding in 2011, many older people did not leave their accommodation due to their concerns about the safety of their properties and livelihoods (Asian Disaster Preparedness Center, 2013). Therefore, ERC managers should make an effort to address these concerns (Kabir et al., 2011), particularly when safety measures require clarification or restrictions are imposed on access or movements.

In addition, women of all ages and pregnant women are identified as vulnerable; they require specific care such as accessible toilets, reproductive and maternal health care (Asian Disaster Preparedness Center, 2013). This group may need specific ERC support, particularly in a disaster relief shelter situation. Lastly, children who have experienced disasters may have prolonged anxiety and stress, and they have specific requirements during the incident such as food and milk; thus, risk communicators should consider providing psychological support and communicating with this group in appropriate ways (Asian Disaster Preparedness Center, 2013).

Most importantly, risk managers in Thailand may need to differentiate the appropriate communication medium most acceptable to each vulnerable group. For example, children may require child-friendly material, such as showing pictures of tsunami escape buildings rather than giving detailed instructions.

4.5 Risk Analysis Factors

Simplifying technical terms

In the process of providing ERC in Thailand, risk analysis, risk assessment, early warnings, risk information processes and dissemination are crucial aspects of disaster management. As the NDPMP 2010–2014 and the DPM Act 2007 have identified, there are 14 types of natural and man-made disasters including floods and landslides, tropical cyclones, fires, chemical and hazardous material spills, transport hazards, droughts, cold spells, forest fires and haze, earthquakes and building collapses, tsunamis, human epidemics, plant diseases and pests, animal epidemics and information and technology threats (Center for Excellence in Disaster Management and Humanitarian Assistance, 2015; DDPM, 2016; Fakhruddin & Chivakidakarn, 2014). Additionally, security threats include sabotage, mine and land mine threats, air threats, and protests and riots (DDPM, 2016; Fakhruddin & Chivakidakarn, 2014). Thus, there are many relevant agencies involved in assessment processes, such as the Thai Meteorological Department, which provides surveillance and warnings for natural hazards, whereas the NDWC performs the key responsibilities of a warning centre, and in particular, monitors tidal waves and earthquakes. These assessments mostly involve using technical terms to describe disaster, and this jargon needs to be simplified (MacDonagh et al., 2016) before conveying it to the DDPM and relevant organisations, to prevent ambiguities and to increase mutual understanding of risks. The DDPM is responsible for dissemination of warning information to provincial and local governments, and Civil Defence volunteers handle surveillance and information circulation at the community level (DDPM, 2016).

After the process of risk assessment by local authorities and relevant government agencies at the provincial level, the provincial governor has the authority to declare the event a disaster, whereas in the Bangkok Metropolitan area, the Director General of the Department of

Disaster Prevention and Mitigation has the authority to declare the event a disaster (DDPM, 2016). These communication processes are required by law to declare a state of emergency and to garner the cooperation of the relevant organisations. To support clear communication about assessments, content in disaster declarations should identify the disaster type, the affected area, the date of the event's beginning and end and a timeline for relief assistance, which is limited to within 3 months after the disaster start date (DDPM, 2016). Disaster declarations can be proclaimed for the affected area by the authorities permitted under the Ministry of Finance, Regulations on Disaster Relief Contingency Fund for Affected People Assistance 2003 and the addendum (Asian Disaster Preparedness Center, 2013).

One example of an early warning communication problem occurred during the 2011 flooding event. Although flood monitoring and forecast information was processed in a short timeframe, systems did not provide support for long-term forecasting. Early warnings and information disseminated from government agencies were therefore inaccurate due to an unsystematic, outdated disaster database, and filled with jargon no one could understand, not even the public servants (Asian Disaster Preparedness Center, 2013). This lack led to problems in understanding among involved agencies and impeded the effectiveness of ERC.

Another example of a risk messaging problem can be found in the signage and language used for ERC, such as in the case of Krabi Province during the 2011 flood. Many misleading signs and pavement signage showed evacuation routes where there were none (Figure 8). The ERC signs in such areas were obstructed, difficult to see, and in some high-tourism areas, were provided in English only (Thomalla et al., 2009).

Figure 8. An example of incorrectly placed evacuation route pavement signage.



Source: Disaster Risk Reduction and Tsunami Early Warning Systems in Thailand (Thomalla et al., 2009).

Providing lessons learnt

There are many improvements that could be made based on lessons learnt. Government agencies and local community groups could engage in projects such as education programmes, trainings, visiting remote areas to disseminate information, and running workshops and meetings. Such activities can provide a considerable sharing of information on disaster management, including ERC, which would raise the awareness of all the participants (Kabir et al., 2011). In addition, relevant government agencies could include specific lessons learnt from events not only in their educational initiatives, but also in their recovery activities and in planning post-disaster.

A good example of this practice in Thailand can be seen from a workshop in how lessons learnt in Krabi Province were used. Local participants and government agencies in such workshop can share their views and mutually learn to address the strategies failures in reaching local communities through ERC practices (Thomalla et al., 2009). Such good practices may also increase opportunities for many people to understand lessons learnt and to clearly identify ERC implementation challenges and constraints, and thereafter, to revise policy and guidance documents in local communities (Thomalla et al., 2009).

However, the problem with workshops or meetings is often that government officials present information solely from their own perspective and leave the workshop before the discussions are finished (Thomalla et al., 2009). This means that important reflections and lessons are likely to be overlooked and are not included in ERC policies (Thomalla et al., 2009). Therefore, there is a clear need to collect stakeholder perspectives to realise better coordination in dealing with disasters.

Another good example of a good-practice ERC learning activity is the CBDRM programme, which is usually organised in local communities by local government agencies in cooperation with relevant organisations such as the DDPM provincial office and local hospital emergency response team (DDPM, 2016; Kabir et al., 2011). Such activities can provide an opportunity for local groups to reflect on disaster problems and to share their experiences of past disasters for inclusion in a disaster management community plan specific to their community (Figure 9).

Figure 9. Photos showing the CBDRM program by the DDPM at work in Rayong and Roi Et province, Thailand.



Source: Department of Disaster Prevention and Mitigation, 2016.

4.6 Communication Channel Factors

Using multiple forms of language and ongoing communication

All communications during hazardous events need to be delivered in various languages such as Thai, English, pictures and sign language to reach different audience groups such as indigenous people and tourists. Emergency risk communication practitioners also should supply up-to-date communication on potential risks and appropriate response measures, as well as placing an emphasis on increasing the number of communication channels they use, particularly at the local community level (MacDonagh et al., 2016; Thomalla et al., 2009).

Problems with language used in ERC arise in some areas, particularly at tourist destinations. Risk communicators in Thailand may need to provide prevention materials such as maps and escape routes to disaster stakeholders, including tourists, in the appropriate languages, both Thai and English (Thomalla et al., 2009). Furthermore, there is a need to consider communication of risk information in a timely manner. For example, during the flooding of 2011, many affected groups complained that they could not evacuate in time because relevant agencies provided little information on the direction of flooding or on evacuation procedures (Okazumi & Nakasu, 2015).

Using multiple channels and social media

In Thailand, traditional media such as TV, radio, newspaper, phone, and facsimile are likely to be used as primary tools to disseminate disaster-related information. In times of crisis, communication centers are assigned to work across government agencies, including MICT, the MOI and the DDPM (Asian Disaster Preparedness Center, 2013). In addition, the Thai Government has access to state-run media to provide ERC, organisations that dominate the majority of national TV and radio networks. The print media are mainly published in the Thai language. The media has the freedom to criticise government, but is required to self-censor when mentioning the military, the monarchy, the judiciary, and other sensitive issues. However, the imposition of martial law and the Army coup in 2014 resulted in restrictions on the media, including ERC content (Asian Disaster Preparedness Center, 2013).

The dissemination of disaster warning information can be classified into four categories provided to the public, which are aligned with the levels of government. At the national level, warning information is distributed through networks and communication systems utilising mass media from the public and private sectors such as TV and radio. At the provincial level, warning information is usually distributed via mass media including radio broadcasts, radio VHF communications, facsimile and provincial public relations material. At the district level, warning information is provided through networks and communication systems available in each province, whereas at a local level, warning information is distributed by community-based volunteers and local surveillance warning networks such as door-knocking, banners, and via loudspeakers carried on moving cars (DDPM, 2016).

Social media have an increasingly important role in public relations and information dissemination in Thailand, as these channels are easy to access and spread information quickly (Kaewkitipong, Chen, & Ractham, 2012). Therefore, a high number of people use social media

in Thailand. On the other hand, social media posts can contain inaccurate information and rumours, which should be treated with caution (Asian Disaster Preparedness Center, 2013).

An example of the challenges to ERC at a local community level is that although communities in big cities have many channels of communication available to them in normal times, in times of crisis, many people in such communities are still vulnerable to disasters, because they struggle to contact public servants for assistance (Khunwishit & McEntire, 2011). The study of Kaewkitipong et al. (2012) has claimed that the precautionary measures taken by higher level government agencies mostly include using websites to communicate to in-line government agencies, whereas in local community networking situations, local people mainly use social media, such as Facebook and Twitter, to share information and knowledge. This could reveal that the government was not use the popular channels among the audiences especially social media, which resulted in the gap of ERC to reach the majority of the public.










In general in Thailand, social networks have become alternative sources of information in times of crisis because of the problems government information dissemination suffer (Kaewkitipong et al., 2012). In addition, social media such as Line and Face are important channels to interact with relevant agencies and to provide information to guide people about how to access assistance services.

4.7 Chapter Summary

In this chapter, I have developed a framework to identify gaps and good practices in ERC as it is practiced in Thailand. The framework allows the identification of key elements that need to be considered for implementing new and improved ERC in Thailand. Developing such a framework is very important to guide ERC managers from multiple agencies. In the first section of chapter 4, I developed the framework from the existing literature and theoretical approaches discussed in chapters 2 and 3. In the following five sections of chapter 4, I outlined my findings about existing good practices and ERC gaps in Thailand. I discussed cultural issues, managerial elements, stakeholders, risk analysis and communication channels. Gaps and good practices are summarised in Table 6 below.

Table 6

Summarising Gaps and Good ERC Practices in Thailand

Criteria defining ERC practices	Current good practices	Current gaps
Cultural factors  Risk perceptions  Cultural considerations  Building trust	 Safety-minded and safety culture orientation  Buddhism's role in ERC recovery  CBDRM training	 Disaster law enforces prevention measures rather than risk awareness  Lack of feedback in prevention and preparedness measurements  Single command system problem

		<ul style="list-style-type: none"> ✚ Lack of consistent information ✚ Technical failures
Managerial factors <ul style="list-style-type: none"> ✚ Clarifying objectives ✚ Planning and guidance 	<ul style="list-style-type: none"> ✚ People-centred development ✚ SNAP and NDPMP focus on community-based disaster reduction 	<ul style="list-style-type: none"> ✚ Reactivity of policy ✚ Disaster law does not support regional cooperation ✚ A lack of ERC planning and guidance
Stakeholder factors <ul style="list-style-type: none"> ✚ Risk messages ✚ Vulnerable groups 	<ul style="list-style-type: none"> ✚ Many volunteer groups such as CBDRM, OTOS and ERT 	<ul style="list-style-type: none"> ✚ Lack of coordination ✚ Omitting vulnerable groups in DRM plans and ERC
Risk analysis factors <ul style="list-style-type: none"> ✚ Technical terms ✚ Lessons learnt 		<ul style="list-style-type: none"> ✚ Lack of coordination and unique information ✚ Misleading and inaccurate signs ✚ Lack of mutual understanding in risk awareness
Communication channel factors <ul style="list-style-type: none"> ✚ Multiple language forms ✚ Multiple channels 		<ul style="list-style-type: none"> ✚ Discontinuity in communication ✚ Under-utilising social media

Abbreviations: CBDRM, community-based disaster risk management; DRM, disaster risk management; ERC, emergency risk communication; ERT, emergency response team; NDPMP, *National Disaster Prevention and Mitigation Plan*; OTOS, One Tambon (subdistrict) One Search & Rescue team; SNAP, *Strategic National Action Plan*.

A full discussion about challenges and opportunities to fill current ERC gaps, and ways to implement improved best practices in Thailand, is accessible in chapter 5.

Chapter Five

Discussion and Conclusion

In this chapter, I discuss the results of my investigations. I address the objectives of the current study, which are: 1) reviewing existing good practices in ERC in Thailand; 2) reviewing existing gaps and good ERC practices in Thailand; and 3) identifying the challenges and opportunities to implementing improved best practices in Thailand. In the first section, I review and discuss key findings about existing good practices in Thailand and gaps in knowledge. In the second section, I highlight the significance of difficulties and opportunities in implementing improved ERC practices in Thailand. Finally, I present my conclusions, address the limitations of the current study, and make recommendations for future research.

5.1 What Thai ERC Leaders Need to Achieve?

Thailand's disaster risk management practitioners face many challenges in improving their capability to deal with hazardous events, particularly coordination and collaboration among relevant stakeholders. Therefore, ERC is an integral component needed to realise truly effective disaster management systems (T. A. Steelman & S. McCaffrey, 2013). Improving risk communication can have a considerable influence on risk management by way of building the public's trust in government agencies, which is often significant to leverage personal relationships and to signal credibility (Earle et al., 2007). Importantly, disbelief in risk communicators can increase public concerns about future disasters (Poortinga & Pidgeon, 2003).

Kent (2010) has stated that there are many possibilities inherent in emergency response strategies and that a number of theories, models and best practices have been studied to obtain a full understanding and to improve ERC effectiveness. Based on my review of theories, existing academic research, and grey literature about good ERC practices both in Thailand and elsewhere (Chapter 2), I have decided that the most important approaches are the traditional approach, the mental noise model, the crisis and emergency risk communication (CERC) model and other existing best practice models such as the UK Alerting Guidance and the Seven Cardinal Rules. Indeed, by examining these models, we can directly address my research question: "How can ERC in Thailand be improved through the use of good practices?" In an effort to identify what works best before, during and after a hazardous event in the present study, I have focused on best practice approaches used globally.

Through my review, I have identified general criteria inherent in good ERC practices and have developed a good practices framework to underpin my recommendations to Thai leaders in ERC. Based on the review of existing literature, I have concluded that there are five key factors affecting ERC, including managerial, stakeholder, risk analysis, communication channel and cultural factors. These five factors are based on what constitutes good ERC itself. I have concluded that good ERC is a three-dimensional concept: 1) a dynamic cycle of continuous improvement, 2) an interactive process, and 3) a concept that requires stakeholder involvement (Infanti et al., 2013). These three requirements all contribute equally to ERC effectiveness. Therefore, good practices and gaps in the Thai version of ERC can be summarised as follows.

In terms of cultural considerations, I have found that practitioners must understand perceptions and concerns of target audiences, who are not the same culturally. A belief that some action is possible and will reduce associated harm is necessary to the crisis sense-making process. If an individual believes they can act effectively to alleviate risk, they are more likely to do so (Veil et al., 2008). Taking into account differences in cultural beliefs and demographics is especially important to the success of ERC in a society as complex as the Thai one. Finally, the necessity of building trust is the one key factor that should underpin all ERC activities.

Regarding managerial issues, I have concluded that clarifying the purpose of ERC and ensuring mutual understanding on all levels by all stakeholders is crucial to good ERC. Ensuring plans and guidance documents are in place before disasters happen and clarifying roles and responsibilities, including resources available to relevant actors, allows for smooth operations when a disaster strikes.

Stakeholder factors are also crucial to good ERC. Addressing the requirements for different ERC messages tailored to different audiences across different stages of the crisis ensures that risks to event victims are mitigated. Considering the accessibility of ERC, especially to vulnerable groups, is also key in today's multicultural societies.

Risk analysis is the third component of good ERC. Translating technical terms into a clear and simple language improves the chances that a majority of stakeholders will understand ERC messages and will therefore take the appropriate actions in a disaster event. Evaluating the processes of ERC and the outcomes after each disaster event, and providing lessons learnt to the involved actors, support the idea that ERC is a dynamic cycle of continuous improvement.

Communication channels used in ERC have been changing rapidly. Using a mixture of communication languages is vital to disseminating information across various channels. In addition, ongoing communication is vital to building trust and in establishing working relationships. Using multiple channels, especially social media, is necessary in societies already familiar with these channels.

Each component of good ERC requires further investigation to provide additional insights into what makes ERC effective in the Thai context, and to identify existing good practices Thai authorities are already using. Subsequently, isolated good practices must be integrated to develop a holistic good practice framework suitable for use in Thailand.

5.2 The Challenges and Opportunities to Improve Good Practices in ERC in Thailand

The findings derived from the literature and good practice guidelines suggest that the five key factors that affect ERC implementation are pivotal, not only in Western countries, but also in Thailand. These key factors, summarised in Table 7 and Table 8, frame the challenges and opportunities to implement ERC in Thailand.

Table 7*Emergency Risk Communication (ERC) Good Practices and Opportunities in Thailand*

Factors pivotal to good ERC practices	Current good practices	Opportunities to strengthen existing good practices
Cultural factors	<ul style="list-style-type: none"> ✚ Safety-minded and safety culture orientation ✚ Buddhism's role in ERC recovery ✚ CBDRM training 	<ul style="list-style-type: none"> ✚ Education, training, and public campaigns ✚ Engaging local communities in local disaster planning processes ✚ Incident Command System (ICS) training ✚ Setting a spokesperson for ERC
Managerial factors	<ul style="list-style-type: none"> ✚ People-centred development orientation ✚ SNAP and NDPMP focus on community-based disaster reduction 	<ul style="list-style-type: none"> ✚ Increasing the number of prevention and preparedness programmes ✚ Law amendments ✚ Development of ERC plans and guidance at all levels
Stakeholders	<ul style="list-style-type: none"> ✚ Many volunteer groups such as CBDRM, OTOS and ERT 	<ul style="list-style-type: none"> ✚ Setting up a coordination centre and a web portal to support volunteers' activities
Risk analysis factors		<ul style="list-style-type: none"> ✚ Develop a web portal for risk assessment and EWS ✚ Evaluation of signage and language used in ERC ✚ Evaluation of ERC consistency across all levels of governance
Communication channel factors		<ul style="list-style-type: none"> ✚ Using multiple forms including signs and maps ✚ Develop a social media channel for government agencies

Abbreviations: CBDRM, Community-Based Disaster Risk Management; DRM, Disaster Risk Management; EWS, Early Warning System; NDPMP, *National Disaster Prevention and Mitigation Plan*; OTOS, One Tambon (subdistrict) One Search & Rescue team; SNAP, *Strategic National Action Plan*.

Table 8*Emergency Risk Communication (ERC) Gaps and Challenges in Thailand*

Factors pivotal to good ERC practices	Current gaps	Challenges to filling gaps
Cultural factors	<ul style="list-style-type: none"> ✚ Disaster law enforces prevention measures rather than risk awareness ✚ Lack of feedback in prevention and preparedness measures ✚ Single command system problem ✚ A lack of consistency in information ✚ Technical failure such as false alarm 	<ul style="list-style-type: none"> ✚ Lack of coordination with local government to implement risk awareness programmes ✚ Lack of coordination between local government agencies to increase community participation in prevention and disaster planning process ✚ Poor cooperation among relevant agencies ✚ A lack of consensus between relevant agencies ✚ No clear assigning of staff responsible for controlling EWS
Managerial factors	<ul style="list-style-type: none"> ✚ Reactive policy ✚ Disaster law does not support regional cooperation ✚ Lack of ERC planning and guidance 	<ul style="list-style-type: none"> ✚ Weak political will ✚ Non-integrated processes and lack of adaptability of relevant agencies ✚ Under-developed ERC plans and guidance; non-cooperation among relevant agencies
Stakeholders	<ul style="list-style-type: none"> ✚ Lack of coordination ✚ Ignoring vulnerable groups in DRM planning and ERC 	<ul style="list-style-type: none"> ✚ Non-coordination between national and local government staff ✚ DRM planning processes not integrated into local government agencies
Risk analysis factors	<ul style="list-style-type: none"> ✚ Lack of coordination and a unique information ✚ Misleading and inaccurate public signage 	<ul style="list-style-type: none"> ✚ Weak or nonexistent collaboration among various agencies ✚ The lack of a coordinating organisation responsible for correction of all incorrect signage
Communication channel factors	<ul style="list-style-type: none"> ✚ Discontinuity in communication ✚ Lack of credible sources 	<ul style="list-style-type: none"> ✚ Poor outreach to local communities

Abbreviations: DRM, Disaster Risk Management; EWS, Early Warning System.

The ideas presented in Table 7 and Table 8 can be used by Thai authorities as a starting point to discuss the challenges and opportunities to fill current ERC gaps and to implement best practices in Thailand. In the following subsections of chapter 5, I discuss some of the points that I consider important to such conversations about changes to ERC in Thailand.

Cultural Factors

Understanding risk perception and cultural beliefs, and building trust in risk communicators, are crucial parts of good ERC. The problem of risk perception arises from the public's lack of risk awareness and trust in the government's capability to deal with crises. Individuals are usually subjective in their evaluations of risk and risk sources and in their decisions about whether protective measures are crucial or can be implemented in a practical way that works for them (Slovic et al., 1981). Therefore, their concerns are amplified when trying to apply Western core principles and practices for effective ERC in a Thai cultural setting.

However, in the case of Thailand, people usually take preventive measures because disaster laws are enforced, rather than because they are aware of the risks. Therefore, the current policy orientation for increasing safety-mindedness and instilling a safety culture among Thai people could be promoted to include risk awareness as a central tenet in ERC policy via law enforcement.

The ways to strengthen existing good practices in risk awareness such as education, training and public campaigns should be fostered to increase safety-mindedness and safety culture in the public. In addition, risk communicators should engage local communities in local disaster planning processes to inculcate local risk perceptions into ERC practices; this process would create community ownership of the plans, thus improving the actual plan and community buy-in (Thomalla et al., 2009). This new agenda could help people in such communities to become aware of the risks they face and to adopt disaster prevention measures to protect their families and properties.

The lack of feedback about prevention and preparedness measures could be overcome by including local communities in the process of applying lessons learnt about prevention measures to improve local disaster planning processes (Thomalla et al., 2009). However, risk communicators need to make sure that local government agencies have the resources to implement such improvements; audit processes could include meeting or training local agency staff regularly and fostering local agencies to increase community participation in prevention and disaster planning processes (DDPM, 2016).

In terms of Buddhism's role in ERC, especially in the recovery phase of disaster events, risk communicators can enhance good practices by providing support to Buddhist clergy via ERC material such as guidance documents and compliment necessary products in daily life for the survivors who may shelter in the temples. Government agencies can also promote disaster awareness as part of their ERC package, especially prevention and preparedness, by collaborating with monks to increase their knowledge about risks and countermeasures. This is because they are grounded at local level and are socially/culturally accepted.

Furthermore, cultural beliefs that challenge the development of good ERC practices can be addressed in the Thai context. Local governments and relevant organisations can promote ERC by using the cultural beliefs of the public as vehicles for their messages. For example, karma is a core belief among Thai people. The principle of karma is about cause and effect in that intent and actions of individual can influence the future of that individual (Falk, 2010), which could be correlated with a risk prevention message that, e.g., wearing a helmet is a good thing to do because it increases one's good fortune in the future. Thus, people may make a decision to wear a helmet because of their beliefs in karma (Falk, 2010).

Another cultural challenge lies in the lack of trust the public has with government agencies; this lack of trust has led to problems with the single command system, a lack of consistency in disaster information and technical failure such as false EWS alarms. Many government agencies experienced the lack of trust such as the West Nile Virus outbreak in Egypt and the Chernobyl accident of 1986 in Ukraine (Sato, 2015). These problems can be solved by training ERC practitioners in the incident command system (ICS), assigning a single spokesperson for ERC and explaining/correcting all false alarms. For example, in the UK, a spokesperson plays an important role to increase a unique risk information (Her Majesty's Treasury, 2005). These solutions could be implemented through cooperation among relevant agencies, a consensus between relevant agencies and by assigning staff to be responsible for controlling EWS (Asian Disaster Preparedness Center, 2013). Such improvements could also be bolstered by building trust through strengthening CBDRM training relationships.

Managerial Factors

As mentioned in chapter four, there are two important factors related to managerial issues, which are 1) clarifying objectives, especially for ERC policy; and 2) the need to support plans and guidance documents with practical solutions based in law. Current Thai policy problems may stem from the nature of the national policy, which is reactive rather than proactive. In fact, the central Thai Government usually issues a new policy document only after a disaster, such as in the case of the last tsunami, and instead, mainly focuses on recovering after events (Khunwishit & McEntire, 2011). Such reactive management often focuses on short-term rehabilitation and ignores a longer-term approach to mitigate exposure to natural and man-made disasters (Lebel, Manuta, & Garden, 2011). This gap could be tackled by increasing the number and depth of prevention and preparedness programmes (Asian Disaster Preparedness Center, 2013) such as CBDRM, particularly at the community level, which is mandated by the central Thai Government's new policy of people-centred economic development (Asian Disaster Preparedness Center, 2013). However, there is a need for political will to engage in changing policy orientation, both at the national policy and at the local government administration levels.

Another gap in the ERC managerial sphere is that the current DPM Act 2007 does not support regional cooperation. This gap could be addressed by legislative amendment to shore up the necessary mechanisms to strengthen policy-process integration and to strengthen relevant agency adaptability (Asian Disaster Preparedness Center, 2013). Furthermore, neither

the DPM Act 2007 nor the NDPMP 2010–2014 has a specific supporting plan or law for ERC, and only brief mention of ERC can be found in section 21 of the DPM Act 2007:

In any occurrence or expected to occur of disasters in local administration area, that Local Director has to proceed the disaster prevention and mitigation operation at once, and he or she shall report to District Director, and Provincial Director immediately.

For the operations on paragraph one, the Local Director shall have power to; (3) Utilize communication devices of the government, or of private sectors in affected area or neighboring areas (DDPM, 2016, p.6).

This means that there is still a lack of sub-law to foster ERC in practice, which is needed to describe communication systems at all three levels; the main, auxiliary, and standby systems (Figure 7). As a consequence of the law issue, there is also a lack of ERC planning and guidance; this existing gap could be filled by developing a comprehensive ERC plan and guidance documents that are suitable for all levels of governance: national, provincial, and local authorities then could be a part of one consistent operation among disaster-relevant government agencies.

Based on current disaster plans, such as SNAP and NDPMP, which focus on community-based disaster reduction (Asian Disaster Preparedness Center, 2013), further good practices in ERC that target people at a community level, could be developed. These good practices would gain greater participation of community leaders in disaster prevention and preparation, which would, in turn, encourage risk awareness at the grass-roots level (Asian Disaster Preparedness Center, 2013).

Stakeholder Factors

One of my key findings about ERC stakeholder factors is that risk messages need to be targeted to specific audiences. In addition, vulnerable groups require risk messages to be generated in such a way that they can access and understand content without a struggle. The major problem for concerned stakeholders is the lack of coordination between government agencies in dealing with hazards (Asian Disaster Preparedness Center, 2013) and their neglect of vulnerable groups. As Fediuk et al. (2010) have stated, stakeholders may perceive crises events differently, depending on their expectations and priorities; Coombs (2010) has also emphasised that the way stakeholders perceive and experience a situation may exacerbate a crisis, which means that risk communicators must be careful in how they address messages to disparate cultural groups. Therefore, stating openly that uncertainty exists and seeking alliances with stakeholders are critical in ERC to avoid the trap of people's too-high expectations on risk manager's capabilities.

To address the lack of coordination in Thai disaster response, risk communicators should deal with this issue by setting up a coordination centre and a web portal for volunteers and government agencies during each disaster, which could help to support both formal and informal networks during disaster response and recovery.

As a consequence of ignoring vulnerable groups in DRM planning and in allocating ERC resources, the recovery process may take longer, or otherwise helpful volunteers may impede

response actions of relevant government agencies. Therefore, risk communicators should develop a deliberate process to include the disaster risk knowledge of those groups of people, borne out of their past disaster experiences, which could help to build adaptive capacity and adaptability to disasters in all actors (Lebel et al., 2011).

As Haer et al. (2015) emphasise the importance of people-centre risk communication, risk communicators also need to provide a communication medium that can reach people in different situations such as people with disabilities and the elderly. Furthermore, risk communicators need to make sure that a practical process exists at a local governance level to ensure that local officials and organisers of CBDRM and OTOS teams take such strategies seriously and act upon them.

Risk Analysis Factors

A lack of coordination and conflicting information emanating from different government agencies are key risks to ERC in Thailand. These interrelated issues could be solved by developing a web portal that supports a fully accessible risk assessment database, EWS information and decision-making tools that can be shared among relevant organisations. However, due to the many government agencies involving risk assessment, risk communicators need to communicate extensively to collaborate among various agencies to develop such a portal (Asian Disaster Preparedness Center, 2013).

Another challenge to ERC practices in Thailand is the plethora of misleading and inaccurate signage that arises during crises. Signs directing victims and actors during disasters could be improved by including local communities in a continuous cycle of sign monitoring and in asking their opinion about sign language use in their local areas. This type of inclusion would enable any coordinating organisation responsible for correction of inaccurate signs to use locals to make those corrections or to report on the locations of the misleading signage. Early warning system training could also help to increase the accuracy of ERC signs.

As the lessons learnt can enhance ERC (MacDonagh et al, 2016), putting lessons learnt into action involves increasing the risk awareness of all groups of people. The process of including lessons learnt into plans for coping with future disasters could be strengthened by evaluating ERC at national, provincial, and local levels, as well as by coordinating local government agencies to set up a series of meetings and workshops.

Furthermore, the issue of how to reach a variety of audiences with specific safety messages requires consideration in a two-way communication context, rather than using the top-down approach (O'Neill, 2004). The Thai Government should therefore integrate ERC concepts into all national-level disaster-related documents to provide a single, coherent ERC plan that all stakeholders can follow to mitigate risks in natural and man-made disasters.

Communication Channel Factors

Thai ERC practitioners have developed good practices in using multiple forms of language and ongoing communication during disasters. However, an underlying problem arises from discontinuity in communication. This gap could be filled by using additional forms of

communication, including signs and maps, to reach local communities simultaneously via traditional media such as televisions and newspapers. Furthermore, risk communicators also could utilise social media by developing a social media channel for each government agency. It may be profitable to use social media in conjunction with traditional media in order to ensure source credibility, which social media by itself often lacks (Seeger et al. 2003; Seeger 2006). Using multiple channels can reach more people to both provide feedback and information, if needed. The country has been developing traditional media channels such as newspapers and TV as ERC channels. In addition, ERC officials are adopting new media such as the Internet and blogs (Chaiwattanaoj, Herrera, Holmberg, Rattanabumrung, & H., 2009), which can be used as the effective tool to disseminate risk knowledge and correct misinformation.

One example of how information has been tailored to both reach and be understood by as many people as possible can be found in a crisis that occurred in Madison, Connecticut in 2008. The outcome shows the importance of tailoring information to address the questions and concerns about which the public is most worried (MacDonagh et al., 2016). Providing answers to the public's questions about risk's concerning is an example of tailoring the information according to the public's needs so they can better understand it. Different types of channels stimulate people differently, so using multiple channels may help to reach and affect a wider range of people. The case of Madison crisis in 2008 is also a good example for developing feedback loops, provides strategies Thai authorities could use in incorporating multiple communication channels to increase outreach.

Furthermore, interactive processes or dialogue can help people understand reasons for changing disaster management practices, laying the groundwork for better support of desired outcomes (McCaffrey, 2004). Importantly, risk communicators must take into account local conditions to help minimise the hazards and to ensure provisions meet community expectations (Steelman & McCaffrey, 2013).

5.3 Limitations of the study

The short time for data collection was one of the limitations to the present study. Such time constraints led to a truncated process of interviewing practitioners from Thailand, which may have compromised the current study, because they held useful information about good ERC practices, knowledge gaps and opportunities/challenges to ERC in Thailand. Conducting interviews would also allow for triangulation which could reduce research bias and establish trustworthiness. Another limitation to the current research was that key words used for searches, such as 'risk communication' and 'best practices', yielded more than a million documents that subsequently required filtering to find relevant ERC data. This situation showed me the importance of ensuring that correct key words are used for searches. However, I mitigated these limitations by selecting fit-for-purpose documents focused on key ERC criteria from credible sources only.

5.4 Areas for Future Research

The current study highlights some weaknesses, gaps, and challenges of ERC implementation in Thailand. The findings revealed that those gaps are significantly involved in cultural, managerial, stakeholder, risk analysis and communication channel factors.

The underlying problem that future research could address is the actual production of planning and guidance documents that are appropriate to the Thai context. In addition, future studies could focus on using social media to help volunteers collaborate with relevant government agencies, which requires an understanding of the problems inherent in disaster management in Thailand and technological knowledge of information management.

5.5 Conclusion

Disasters linked to natural hazards in Thailand are increasing in frequency and the damage involves loss of lives, damage to properties and psychological problem. Therefore, effective ERC is very important to reduce loss and damages caused by these disasters. Government agencies are generally expected to respond quickly in order to mitigate serious harm. Based on learnings from past major disasters in Thailand, such as the tsunami in 2004 and flooding in 2011, the country's ERC seems to have a significant weakness regarding the coordination required to disseminate disaster information to stakeholders in Thailand, including people living in hazard-prone areas and local government agencies. Therefore, in the current dissertation, I have aimed to address the research question, "How can ERC in Thailand be improved through the use of good practices?" I have 1) identified existing good practices in ERC in Thailand 2) developed a solid framework to identify gaps and good ERC practices, specifically tailored to the Thai context; and 3) identified the challenges and opportunities to implementing a full set of best practices in Thailand. The current research was conducted by using a qualitative content analysis using thematic analysis as a methodological approach. Data was gathered using a number of databases and academic documents such as ERC guidance, reports, and academic publications. In the present study, I have identified key factors defining good ERC practices, which are cultural, managerial, stakeholder, risk analysis and communication channel factors. Such key factors are relevant in the assessment of ERC practices in Thailand to identify current good practices, gaps, challenges, and opportunities to strengthen practical applications of ERC in the country. It is important to improve ERC communication so disaster risk is reduced. Therefore, I proposed the ERC strategies to fill the current ERC gaps and strengthen ERC good practice in Thailand that are believed to enhance disaster management capacity in Thailand and ultimately to increase resilience in Thai communities.

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