

Auckland University of Technology (AUT)

**A qualitative descriptive study: Understanding
flood and storm risk communication,
perceptions, and interpretations of Myanmar
migrants in the context of Auckland, New
Zealand**

Su Myat Kyaw

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Primary Supervisor: Dr Ailsa Holloway

Abstract

Migrant groups are viewed as particularly vulnerable in conditions of increased disaster risk. This represents a key consideration for disaster risk reduction planning in urban areas with large, diverse populations characterised by both dominant and less visible migrant groups. This study sought to examine the flood and storm perceptions of the “invisible” Myanmar migrant community in Auckland, New Zealand. It investigated how the migrants perceived flood and storm threats in an Auckland context as well as their information-seeking and preparedness actions in response to warning advice.

Using a qualitative descriptive study, semi-structured interviews were carried out with eight Myanmar migrant participants residing in Auckland. Due to the COVID-19 pandemic at the time of data collection, all interviews were conducted remotely and digitally recorded. Through thematic analysis of interviews and NVivo software for the coding process, three main themes were identified: 1) flood and storm risk perceptions and interpretations for action, 2) socio-cultural perspectives and practices and 3) preparedness. Study results also revealed four important issues that cut across all themes. These were the lasting effects of prior experience, language, bonding social capital and the exclusion of migrant sub-minorities. While findings on the role of bonding social capital and language barriers were consistent with existing literature, the exclusion of migrant sub-minorities from risk communication processes were unexpected. Study results also highlighted shortcomings in disaster risk communication models that do not adequately incorporate social capital considerations or address communication gaps due to poorly developed bridging and linking social capital. It calls for further migrant-related research that integrates issues of social capital with prevailing risk communication models, and that advances an inclusive approach to resilience-building in highly diverse urban settings.

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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 (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.”

Signed:

Date: 8 October 2020 (made changes on 18 January 2021 according to examiners' reports)

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Chapter 1 Introduction

There are rising concerns about the continuing increase in disaster frequency, severity, and complexity (Ismail-Zadeh, Cutter, Takeuchi, & Paton, 2017). Recent disaster-related studies and reports have raised the alert; for instance, De Smet, Lagadec, and Leysen (2012) noted that “It seems that our planet has become a more dangerous place to live than ever before” (p.138) due to the number of disasters, both qualitatively and quantitatively. Similarly, Holloway and colleagues posited the likelihood of encountering “a complex amalgam” of future disasters due to population explosion, climate change, imbalanced socioeconomic status, and the fourth industrial revolution (Holloway, Triyanti, Rafliana, Yasukawa, & Kock, 2019). In this context, it is anticipated that millions of people and properties may be seriously affected by increasing disaster rates and evolving risks (De Smet et al., 2012; World Economic Forum, 2019). In addition, the intensity and frequency of profound weather events are more likely to soar in near future (Lejano, Casas Jr, Montes, & Lengwa, 2018).

1.1 Background

Among the groups considered most at risk in disasters, immigrant populations have been highlighted by a number of studies (Eisenman, Cordasco, Asch, Golden, & Glik, 2007; Eisenman, Glik, Maranon, Gonzales, & Asch, 2009; Johnson, 2007; Kulatunga, 2010). For instance, when 2005 Hurricane Katrina made landfall in the United States of America (US) states of Florida and Louisiana, minority migrant communities did not have access to evacuation and recovery measures (Eisenman et al., 2007). There are many reasons for this increased vulnerability of migrant groups. These include their status as ethnic/cultural minorities and language barriers as well as certain types of discrimination and improper preparedness practices based on differences in risk perception, interpretation, and culture (Burke, Bethel, & Britt, 2012; Carter-Pokras, Zambrana, Mora, & Aaby, 2007; Eisenman, Glik, Gonzalez et al., 2009; Fothergill, Darlington & Maestas, 1999; Hanson-Easey, Every, Hansen & Bi, 2018; Johnson, 2007; Keerthy & Sam, 2018; Lippman, 2011; Nepal, Perry & Scott, 2010; Yong, Lemyre, Pinsent, & Krewski, 2017).

While past studies have predominantly focused on the adverse impacts on refugees or emerging communities in the aftermath of a disaster, there has been less focus on migrant risk prior to a disaster event. This underlines a knowledge gap related

to levels of migrant familiarity with the disaster risk profile in a country of non-origin due to migrants' limited hazard knowledge of storms and floods, inadequate self-protection, and lower risk perceptions than non-migrants (Bernales et al., 2019; Maldonado, Collins & Grineski, 2016; Wang, Amati, & Thomalla, 2012). The second constraint on studies of migrants' disaster experience is an imbalanced focus on different ethnic groups. For instance, while substantial research has been conducted on the experience of the Latino migrant population in the U.S, there is limited access to similar studies for other migrant groups (Burke et al., 2012; Carter-Pokras et al., 2007; Cuervo, Leopold & Baron, 2017; Eisenman, Glik, Gonzalez et al., 2009; Eisenman, Glik, Maranon et al., 2009; Johnson, 2007; Mathew & Kelly, 2008). Similarly, both globally and in New Zealand, specific studies on the disaster preparedness of Myanmar migrants remain limited. Although Myanmar migrants have been included in some disaster-related research, these studies have not profiled specific issues facing the Myanmar migrant community (Hanson-Easey et al., 2018; Shepherd & van Vuuren, 2014).

Under conditions of increased global mobility, future disasters are expected to pose specific challenges for both migrant populations and their receiving communities. In the US, the need to tackle migrants' specific needs in disasters was recently acknowledged by "the New York Declaration for Refugees and Migrants" (The UN Refugee Agency [UNHCR], 2016). At global level, migration is also an issue that crosscuts all the Sustainable Development Goals (SDGs) (International Organization for Migration [IOM], 2019).

The disaster-related facing challenges in ethnically and culturally diverse cities are evident in Auckland, New Zealand (Marlowe, Neef, Tevaga & Tevaga, 2018). On the one hand, New Zealand faces a range of serious natural hazards and risks (National Emergency Management Agency, 2019). Auckland is both exposed and vulnerable to a number of natural hazards, with severe storms and floods, two of the most potential hazards (Auckland Council, 2019). These hydrometeorological threats pose additional challenges to New Zealand's largest and most multicultural city. In addition, Auckland's growing migrant population places extra pressure on civil emergency management systems regionally in terms of dealing with natural hazards and risks. Yet, even in these conditions, resilience in migrant communities can be strengthened through better understanding of different cultural, socio-economic, and linguistic issues (Gaillard, 2010).

1.2 Focus on Risk Communication

Given that modern disasters are more likely to be 'a new ball game', the sociology of disaster and human behaviour are integral parts of an approach to future emergency

management (De Smet et al., 2012, p. 142; McEntire, 2004). In this context, the concept of risk communication is a key element in the effective management of disaster risk. Risk communication is understood as the sharing and dissemination of information, warnings, and opinion “among individuals, groups and institutions”, including various messages around “the nature of risk”, how to react risk messages, and risk management plans of institutions (US Department of Health and Human Services, as cited in Khan, Mishra, Lin, & Doyle, 2017). It is an encompassing concept that includes providing information or developing people’s understanding of scientific information in coping with emergencies (Khan et al., 2017). “Risk communication has been integral to disaster management for 50 years” (Glik, 2007, p.35) and it is also assumed as a generalised right of the public to realise the risks and hazards that exist (Reynolds & Seeger, 2002). Its application facilitates emergency or disaster managers in carrying out preparedness activities directly for the public or a community, such as raising awareness, spreading information flow, disseminating early warnings, and realising emergency responses. Barry and colleagues also noted that risk communication is the core of the risk management cycle, facilitating risk analysis, policy development, and implementation, as illustrated in Figure 1 (Barry, Sixsmith & Infanti, 2013).

Figure 1 *Risk communication in risk management cycle*
(Source: Barry et al., 2013, p. 6)



However, risk communication with migrant communities faces additional challenges due to the role of culture and policy as well as the effectiveness of the risk

communication system itself (Jha et al., 2018; Nepal et al., 2012). Both scientific understanding of and socio-cultural beliefs about a specific risk factor are crucial in delivering effective risk messages (Reynolds & Seeger, 2002). In this context, effective risk communication is viewed as a crucial key for alleviating the vulnerability of marginalised communities, particularly those that are ethnic/cultural minorities.

1.3 Rationale, Research Question, and Objectives

Being the most culturally diverse city nationwide, Auckland's demographic profile in 2006 comprised more than 150 different ethnic groups, and over 120 languages (Auckland Council, 2013). Myanmar immigrants specifically constituted a small part of the overall Auckland Asian migrant population, falling within the 19% 'other Asian group' after factoring in larger migrant communities, from China, Japan, India, and Thailand (Friesen, 2015). This has implications for the visibility of Myanmar migrants for government services including access to support for flood and storm preparedness. Given the limited profile of this tiny community, it was the researcher's interest to explore whether the community can access the government's services related to flood and storm warning and preparedness.

The research question which this dissertation sought to address is: What are the flood and storm risk communication, perceptions, and interpretations of Myanmar migrants in the context of New Zealand, Auckland?

This research question was addressed by three guiding objectives as follows:

- 1) To explore the familiarity of Myanmar migrants with Auckland's disaster risk profile.
- 2) To understand the cultural and social barriers and enablers of the Myanmar migrant community in flood and storm preparedness.
- 3) To provide insights on the barriers and the opportunities for Myanmar migrants to prepare themselves by improving risk communication.

1.4 Dissertation Outline

This dissertation comprises six chapters:

Chapter One, the present chapter, introduces the researcher's project encompassing the problem context, rationale, and key concepts. It also describes the research gap, the research question, and its objectives.

Chapter Two critically reviews the previously published literature on increasing migration, the growing number of disasters, and the heightened vulnerability of migrants in times of adversity. It also addresses the tiny Myanmar migrant community in the multicultural city of Auckland, New Zealand, and knowledge gaps in previous work. The chapter covers key technical terms including migrants, risk, hazard, resilience, vulnerability, and disaster risk reduction (DRR) while presenting current policies and practices related to DRR.

Chapter Three clarifies the methodology, which is a qualitative descriptive approach. This includes a discussion of the research paradigm, research design, research rigour, ethical considerations, and likely research output.

Chapter Four provides the findings and outcomes of this study after analysing data collected from online interviews with Myanmar migrants.

Chapter Five discusses the implications of the study findings, linking to current relevant literature, emphasising the implications for practice, and pointing out the strengths and limitations of this study. It also presents areas for future research, together with a summary of key findings.

1.5 Chapter Summary

This chapter has covered the provided background and introduced some major themes that are relevant to the research topic. Certain gaps in existing literature and knowledge as well as the researcher's interest have been described. The chapter introduced the research question with its three objectives and provided an overview of the dissertation. The next chapter will present an in-depth review of the existing literature, related to this study.

Chapter 2 Literature Review

2.1 Introduction

This study is informed by a wide-ranging review of relevant literature. It begins by providing an overview on migrants and disasters and continues by focusing on changing perspectives on disasters. The chapter also addresses the literature on risk communication as well as migrant vulnerability in severe weather events. It concludes by identifying the knowledge gap that guides the focus of this case study.

The *literature search* focused on different migrant groups and their vulnerability to disasters. Due to the research emphasis on storms and floods, the search process excluded other disaster types, for instance, earthquakes and drought. The literature search was carried out between November 2019 and September 2020. The researcher could access the Auckland University of Technology (AUT) library website, Google Scholar, Scopus, and other reliable websites to search for relevant literature. Thorough literature searching was achieved by using the terms, ‘migrants, asylum seekers, immigrants, and refugees’ for migrants; and ‘emergency risk communication, preparedness, risk reduction, and disaster preparedness’ for risk perceptions of migrants; and by adding the terms such as ‘disaster, catastrophic storm, name of specific storms and cyclones, for example, “Cyclone Nargis”, flooding, inundation, cyclone and typhoon’ to identify relevant articles that included the status of migrants in disasters, specifically floods and storms.

2.2 Migrants and Disasters - Key terms

While the migration of people is termed as “the third wave of globalization” (Douglas, Cetron, & Spiegel, 2019, p. 1), there has been a long relationship between migration, culture, and disaster. Almost 20 years ago, Bankoff (2001) already noted a linkage between the rising number of disasters and global migration patterns. More recently, in parallel to rising population mobility, there has been a growing concern around climate-related disasters and climate shocks, linked to demographic change, climate change, and an “over-stressed environment” (Holloway et al., 2019; Scolobig, Prior, Schröter, Jörin, & Patt, 2015). Under conditions of increased global mobility, these current and future climate risks are expected to pose specific challenges for both migrant populations and their receiving nations. Such challenges are evident in ethnically and culturally diverse cities such as Auckland, New Zealand (Marlowe et al., 2018).

While the term ‘migrant’ is widely applied, there are numerous sub-categories with different interpretations and legal implications. Migration refers to persons moving from their place of origin to a host country, whether it is a forced or voluntary move (McAuliffe & Ruhs, 2017; Williams & Graham, 2014). Generally, the term ‘*migrants*’ is applied to the movement of people within or between countries for the development of their socio-economic status (Douglas et al., 2019). However, there are important differences between migrants and other groups, such as refugees and displaced people. According to the United Nations Convention Relating to the Status of Refugees (1951), the term ‘*refugee*’ has been specifically applied since 1951 to refer to a person seeking the protection of the host country for racial, social, national, political, or religious reasons. Asylum seekers and displaced persons fall within the sub-category of safety-seeking refugees. While an ‘*asylum seeker*’ is a person who has applied and is waiting for refugee status for safety reasons in a host country, a ‘*displaced person*’ means an individual fleeing from his/her previous community (Douglas et al., 2019).

In contrast, there has been no similar international consensus in defining migrants (Castles, 2004; Gieling, Thijs, & Verkuyten, 2011) although migrants can be distinguished by different durations of stay. Douglas and colleagues (2019) indicated that globally recognised definitions roughly differentiate the terms ‘migrants’ into “long-term immigrants or emigrants, short-term immigrants or emigrants, residents returning after a period of working abroad and nomads” (p. 2). Here, the term ‘*long-term migrants*’ specifically refers to people who move to and reside in a country for more than one year, falling within the category of lawful migrants. The classification of long-term migrants aligns with the focus of this study.

2.3 Changing Perspectives on Disasters

In recent decades, thinking on disasters and risks has greatly changed while today, disasters are seen as the result of development. Previously, disaster management was carried out in a traditional reactive way, neglecting mitigation and better protection actions (McEntire, 2004). This shift to a more developmental approach is globally signalled through the *Sendai Framework for Disaster Risk Reduction 2015-2030* (SFDRR). Central to the core of the *Sendai Framework* are three key elements, a better understanding of risk, a shift to managing risk from managing disasters, and a broader approach pertaining the entire society in risk management (United Nations Office for Disaster Risk Reduction [UNDRR], 2015).

In New Zealand, similar changes are reflected in the 2019 *National Disaster Resilience Strategy* (National Emergency Management Agency, 2019). In this context,

“New Zealand takes a proactive, anticipatory, smart approach”, to mitigate impacts and the risks of climate extremes in advance. This recognises the cost-effectiveness of a proactive approach whose over-arching outcome is “the substantial reduction of disaster risks and losses in lives, livelihoods, and health and the economic, physical, social, cultural and environmental assets of persons, businesses, communities and countries” (National Emergency Management Agency, 2019, p. 25; SFDRR 2015-2030, p. 12).

2.3.1 Key concepts and their evolution

“There is no such thing as natural disaster since disasters are more a consequence of socio-economic than natural factors” (O’Keefe, Westgate, & Wisner, 1976, p. 1).

More than forty years ago in 1976, this statement by O’Keefe et al. challenged prevailing thinking about disasters as “natural” and repositioned these events as socially or politically constructed processes. Over time, this thinking has evolved - leading to the UN (2016, p. 13) defining ‘*disaster*’ as:

a serious disruption of the functioning of a community or a society at any scale due to hazardous events interacting with conditions of exposure, vulnerability, and capacity, leading to one or more of the following: human, material, economic and environmental losses, and impacts

The UN definition underlines the crucial role of vulnerability in affecting disaster occurrence, going beyond a narrow focus on natural hazards. Despite a lack of international agreement in defining ‘*vulnerability*’, the term has been explored by different fields (Cardona, 2004; Heijmans, 2001; McEntire, 2004; Weichselgartner, 2001).

In 2006, Manyena noted the existence of more than “two dozen” definitions of vulnerability. These have been drawn from fields such as geography and the natural sciences, but also include perspectives from development and welfare economics, highlighted by work by Amartya Sen and Robert Chambers (Manyena, 2006). A defining feature of this concept that cuts across these wide-ranging perspectives is that vulnerability in the context of disaster differs from “being poor”. It embraces a wide range of “physical, economic, political and social factors” that increase the likelihood of loss and hardship under exposure to natural or anthropogenic threats (Manyena, 2006).

Birkmann et al. (2013) expanded this understanding of vulnerability by highlighting six thematic dimensions that should be applied in any holistic vulnerability assessment. In addition to the special, economic and physical dimensions, they also

underlined the importance of cultural, environmental and institutional vulnerability, as key considerations that increase the likelihood of disaster loss (Birkmann et al., 2013).

The progressive expansion in the use and application of vulnerability as a central concept in the disaster risk domain is reflected by its UN definition as “the conditions, determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards” (UN General Assembly, 2015, p. 24).

To understand vulnerability in the context of this study, the term ‘*marginalisation*’ is also important. It refers to people living in a state of poverty, with limited opportunity for accessing central government services, in remotely isolated locations, or as an ethnic minority, with this marginalisation made worse in the aftermath of disaster (O’Keefe et al., 1976; Wisner et al., 2012). Since marginality and vulnerability are a consequence of social protection deficit, the two terms are closely interrelated (Gaillard, 2010). Furthermore, vulnerable and marginalised groups are more likely to struggle in the recovery phase after a disaster or hardship (Wisner et al., 2012). Therefore, in managing future potentials and reducing disaster risks, the “intimate relationship” between vulnerability and marginalisation should be taken into consideration (Gaillard, 2010).

The term ‘*resilience*’ is centrally applicable to the reduction of vulnerability (National Emergency Management Agency, 2019). People often assume ‘*resilience*’ to be the positive side of a single coin while the vulnerability is viewed as the negative side (Twigg, as cited in Manyena, O’Brien, O’Keefe, & Rose, 2011). As a counter to vulnerability, resilience refers to people’s recovery during an expected time period with “the minimal or no resistance at all” because its meaning in Latin is to “bounce back” (Manyena et al., 2011, p. 2). Alternatively, resilience can be understood as the ability to plan or prepare for absorbing, recovering from, and cleverly adapting to adverse events (The National Academies, 2012:1, as cited in Weichselgartner and Kelman, 2015). According to the UN (2016), ‘*resilience*’ can be seen as the capacity of a system or society for building back better after exposure to hazards in a timely and efficient manner including thorough rehabilitation and risk management. The term ‘*resilience*’ is also often used interchangeably with capacity.

‘*Capacity*’ refers to “the combination of all the strengths, attributes, and resources available within an organization, community or society to manage and reduce disaster risks and strength resilience” (UN, 2016, p. 12). Any deficit in socio-economic, political, and environmental structures triggers capacity reduction and the simultaneous appearance of vulnerability (Gaillard, 2010; Wisner et al., 2012), increasing the likelihood of a disaster. In recent years, there has been a growing emphasis in the disaster field on

enhancing capacity or strengthening resilience in a society or population to better manage disaster risks and to reduce disaster losses.

In this research, the term '*risk*' refers specifically to '*disaster risk*' since the project is related to flood and storm risk communication for Myanmar migrants. In the U.N definition (2016), '*disaster risk*' is the occurrence of property destruction or loss of life in a community or society at a particular time, "determined probabilistically as a function of hazard, exposure, vulnerability, and capacity" (p. 14). In this context, '*exposure*' can be an underlying factor for triggering disaster risk, together with vulnerability, hazard, and capacity. In the U.N terminology (2016), '*exposure*' is identified as "the situation of people, infrastructure, buildings, the economy, and other assets that are exposed to a hazard" (p. 18).

Furthermore, Wisner, Gaillard, and Kelman (2012) formulated an updated equation of disaster risk as:

$$\text{"DR} = \text{H} \times [(\text{V}/\text{C}) - \text{M}]\text{"}$$

"DR= Disaster Risk, H= Hazard, V= Vulnerability, C= Capacity, and M= large scale risk Mitigation" (p. 21).

This conceptualisation shifts the focus away from managing disasters to managing disaster risks. While focusing on disaster risk, an inseparable concept, hazard, should also be mentioned. Recognition that "not every hazard is the source of a disaster" (De Smet et al., 2012, p. 138) reflects the changed understanding of hazard. '*Hazard*' means a process or human activity that may create a loss of people's lives and severe impacts on health, property, socio-economic, and environmental domains (UN, 2016). According to the *Sendai Framework* (UNDRR, 2015), hazards can be broadly classified into natural, anthropogenic, or human-induced and socio-natural hazards. Since the researcher concentrated on floods and storms in this study, the project fell within the sub-category of hydrometeorological hazards.

2.3.2 New Zealand perspectives on managing disasters and risks

In 2010, O'Brien and colleagues stressed the need for a new paradigm shift on disaster management to concentrate on community preparedness by building resilience and by thinking at both community and institutional levels (O'Brien, O'Keefe, Gadema, & Swords, 2010, p. 505). Global shifts in thinking about disasters, were reflected in new approaches being proposed - for instance, a shift from disaster/emergency management to disaster risk management and, in New Zealand, an explicit focus on resilience building (McEntire, 2004; National Emergency Management Agency, 2019).

In this context, the New Zealand's *National Resilience Strategy* has repositioned “emergency management” and embedded it as one of its three priorities (National Emergency Management Agency, 2019, p.3) while this policy shift explicitly incorporates “the ‘4Rs’ of risk reduction, readiness, response, and recovery” (National Emergency Management Agency, 2019, p.9). New Zealand's national resilience strategy also has a wider developmental scope that is aligned with the *Sendai framework*.

2.3.3 Rising concern on hydrometeorological hazards

New Zealand's policy focus on resilience building is in part due to growing concerns about climate change, including a greater occurrence of severe storms and floods. Auckland's particular location makes it susceptible to natural threats, with flooding seen as a regular event and tsunami and/or storm as an infrequent one (Auckland Council, 2019; Rañeses, Chang-Richards, Richards, & Bubb, 2018). It is estimated that disasters attributed to “superstorms” (p. 38) and other weather extremes are likely to occur due to the combined impacts of climate change and Auckland's growing population, which was 33.4 percent of the country's population in 2016 (Auckland Council, 2019). Adapting to the nature of Auckland's growing diversity, Auckland Council and Civil Defence Emergency Management (CDEM) set the group's goals involving 4Rs and an additional R, which is resilience. This additional R is a specific goal of Auckland, integrating the resilience of all communities and aiming to become “the world's most liveable city” (Auckland Council, 2019, p. 98).

2.4 Risk Communication as a Key Theme

Central to advancing resilience building, including improved management of emergencies, is the role of risk communication, for instance, early warning. This, too, has changed over recent years, with a shift from traditional ‘top-down’ approaches to more inclusive, participatory applications. Scolobig and colleagues (2015) argued for encouraging protective behaviours in risk communication since existing models had been challenged by growing multiculturalism. In times of uncertainty, risk communication is fundamental in transferring information among the public and institutions, as well as vital to decision making (Khan et al., 2017). An increased uptake of ‘community-based’ approaches has been seen in disaster risk reduction (DRR) as it enhances a “harmonious interaction” between authorities and different levels of societies (Titz, Cannon, & Kruger, 2018, p. 8). Since the traditional ‘top-down approach’ was one-way risk communication and unsuitable under all conditions, Scolobig and colleagues (2015) emphasised the combination of ‘top-down’ and ‘people-centred’ approaches, fostering two-way communication and public participation in managing hazards and risks.

2.4.1 Definitions and related theories

Risk communication crosses many fields and disciplines: risk interpretation and protective action decision making (Babcicky & Seebauer, 2019; Bubeck, Botzen, Laudan, Aerts, & Thieken, 2018; Eiser et al., 2012; Lindell & Perry, 2012), climate change impact protection motivation (Chen, 2020), forecasting of and warning about natural hazards (Khan et al., 2017), and strengthening positive understanding between first responders and animal owners (Westcott, Ronan, Bambrick, & Taylor, 2017). The first traditional definition of risk communication was one-way communication, transferring messages from the government body to the public and relevant associations (Palenchar & Heath, 2002). Shifting to a new paradigm, an interactive or two-way communication refers to “dialogic, participatory model, enhancing self-protective behaviours” (Sellnow, Ulmer, & Seeger, as cited in Hanson-Easey et al., 2018, p. 621). Despite the appropriateness of the latter definition for immigrant communities, Hanson-Easey et al. (2018) stressed that “successful risk communication is more than language” (p. 621), and includes sharing a “consensual comprehension” between two parties, for instance, signs and symbols.

Risk communication is informed by models such as protection motivation theory (PMT), the protection action decision model (PADM), and risk interpretation and action (RIA). PMT was not originally introduced for the disaster domain but both original and extended theories explain threat and coping appraisal in times of hardship (Rogers, 1975). Sources of risk information shape factors such as an individual’s fear level and possible response practices that lead to protection motivation behaviours (Bubeck et al., 2018; Chen, 2020).

While the models, PMT and the PADM, share similarities, the latter focuses on the household application of preparedness actions based on a series of risk information sources. The PADM argues that preparedness action implementation depends on how people perceive an environmental threat, which reflects their belief about an extreme environmental impact on them (Lindell & Perry, 2012). They also noted that risk information sources such as social cues, warnings, receiver’s behaviours, and beliefs, demonstrated the onset of risk identification, risk assessment, and preparedness measures.

2.4.2 Risk communication and social capital

Since risk communication involves multiple groups, it is crucially informed by social dynamics, especially social capital. Social capital is a supporting term involving social cohesion and community participation; social capital plays a role in disseminating risk information which contains translations and interpretations of messages for non-native

communities (Hanson-Easey et al., 2018). In the work of Aldrich and Meyer (2014), the network of social capital is a resource supply including information and psychological support, and it can also be viewed as an alternative approach to resilience building and pre-disaster mitigation. These authors stated there are three types of social capital: bonding, bridging, and linking capitals. *Bonding* refers to ties among individuals such as friends and family while *bridging* means connections between social groups. *Linking* refers to the linkage between citizens and authorities.

“Social networks can act as important intermediaries for endorsing, disseminating, and interpreting risk messages” (Hanson-Easey et al., 2018, p. 626). Hanson-Easey et al. (2018) also demonstrated that, in times of natural hazards across Australia, positive social capital can serve as an intermediary for CALD communities in delivering risk communication information. The role of social capital is not just relevant in responding to hydrometeorological hazards and it was valued in different responses in different fields. For instance, in the recent COVID-19 pandemic, it has been recognised as a key dimension in New Zealand’s response (Williams, 2020). In recent research by Princeton University, Cameron (2020) stressed that social capital, in the form of “strong ties between individuals” of New Zealand, enabled the government and citizens to work and “adapt quickly to the fast-shifting situation” (p. 36).

2.5 Migrant Vulnerability in Severe Weather Events

2.5.1 Overview

Numerous studies have highlighted the disproportionate impacts of disasters on migrant populations in severe weather events (Eisenman et al., 2007; Eisenman, Glik, Maranon et al., 2009; Johnson, 2007; Kulatunga, 2010). For instance, in the devastating 2015 Chennai flood in India, minority migrant groups did not access the flood warnings nor receive any assistance (Keerthy & Sam, 2018). These examples illustrate the more vulnerable nature of migrant people in comparison to resident counterparts which stems from many factors. These include bias and ignorance in race, culture, and ethics, inaccessible evacuation services, and unequal treatment at different stages of a disaster (Eisenman et al., 2007).

Discrimination against migrant groups in disasters was demonstrated in the 2011 Thailand flood and 2015 Chennai flood in India. During and after the 2011 Thailand flood, migrants faced certain forms of discrimination such as isolation or segregation, underpaid work, and the denial of aid (Schaur et al., 2017). In the 2015 Chennai flood, the already existing antimigrant sentiment of the local population also created extremely

difficult conditions for migrant workers (Keerthy & Sam, 2018). Similarly, Latino migrants became “silent victims” in the 2005 Hurricane Katrina in the U.S as they faced, job discrimination, and less sympathy from the general population (Johnson, 2007, p.14).

One of the reasons for migrant vulnerability is their status as cultural/ethnic minorities. For example, Carter-Porkras et al. (2007, p. 465) noted that recently-arrived Latino migrants in Montgomery County, Maryland, in the US, were more vulnerable to disasters than non-Hispanic Whites because of socio-economic differences and limited access to financial and material resources. Lippman (2011) also highlighted that the majority of the victims of Hurricane Katrina in the US were minority ethnic groups from Latin America. This was due to their limited accessible to comprehensive disaster preparation, prevention, and recovery practices.

These examples underline the crucial role that culture plays in disaster risk management. The concept of culture refers to a collection of features containing beliefs, norms, symbols, and values (Kulatunga, 2010). In this context, *beliefs* refer to emotional acceptance as real for certain things while *norms* exist in the state of standards of conduct, having behavioural expectations. *Cultural values* provide beliefs and ideas about behaviour including hospitality, unity, trust, leadership, and maintaining a relationship (Kulatunga, 2010; Kenney & Phibbs, 2015).

Kulatunga (2010) also suggested that culture has the ability to increase or decrease the vulnerability of community to disaster. This was illustrated after the 2011 Christchurch earthquake in Māori responses. These include accessing information, utilising assistance from authorities, mutual trust, and extending assistance within the community. Reciprocally, the Māori’s possession of cultural capital, representing social connectedness, participation in decision-making, trust, and their local knowledge, can enhance the adaptive capacity in time of stress such as disasters (Kenny & Phibbs, 2015). These responses reflect a strong, mutually supportive communitarian culture, highlighting how culture can be a strength in disasters (Kenney & Phibbs, 2015).

2.5.2 Focus on preparedness and risk communication

Migrant communities face specific obstacles in risk communication, especially in the preparedness phase. Over 20 years ago, Fothergill and colleagues (1999) showed that culturally diverse groups were less likely to access pre-event mitigation efforts and disaster education opportunities. For instance, migrants (including refugees and asylum seekers) are vulnerable to disaster due to low-economic status and their “limited English proficiency” (Burke et al., 2012, p.2). Other researchers have noted that the likelihood of migrants including refugees becoming disaster victims is mainly due to language limitations (Burke et al., 2012; Carter-Pokras et al., 2007; Eisenman, Glik, Gonzalez et

al., 2009; Fothergill, Darlington, & Maestas, 1999; Hanson-Easey et al., 2018; Burke et al., 2012; Nepal, Perry & Scott, 2010; Yong et al., 2017s).

Specifically, during the readiness phase of a disaster, improper preparedness practices were noted as a cause of migrants' vulnerability (Carter-Pokras et al., 2007; Eisenman, Glik, Gonzalez et al., 2009; Fothergill, Darlington and Maestas, 1999; Nepal et al., 2010; Schaur et al., 2017; Yong et al., 2017). These observations are consistent with those of Nepal et al. (2010) who also recorded that "reaching out" to migrant populations in preparation activities is difficult because of cultural and linguistic complexities.

2.6 Addressing Knowledge Gaps Through an Auckland case-study

Auckland is exposed to a range of natural hazards, including severe storms and floods (Auckland Council, 2019). It is also dealing with different migrant groups since it is the largest and most multicultural city of New Zealand. Among Auckland's larger Asian migrant communities, Myanmar migrant group specifically constituted a small portion, falling within the 19% 'other Asian group' (Friesen, 2015). Fallen within the category of "invisible" migrants and given the limited profile of this tiny community, this study sought to explore whether the community can access the government's services related to flood and storm warning and preparedness.

This study was also framed by growing concerns for the resilience of CALD communities across the 4Rs, namely reduction, readiness, response, and recovery of disaster phases (National Emergency Management Agency, 2019, p. 24). In this context, the research addresses an important knowledge gap. It notes that while past studies have predominantly focused on the adverse impacts on migrant groups in post-disaster period, there has been less focus on migrant risk prior to an event. This underlines a knowledge gap related to levels of migrant familiarity with the disaster risk profile in a country of non-origin due to immigrants' limited hazard knowledge of storms and floods, inadequate self-protection, and lower risk perceptions than non-migrants (Bernales et al., 2019; Maldonado et al., 2016; Wang et al., 2012).

Another limitation in research on migrants' disaster experience, due to an imbalanced focus on specific ethnic groups, was also noted. For example, although the disaster experience of the Latino migrant population in the US have been studied substantially, there is limited access to similar studies for other migrant groups (Burke et al., 2012; Carter-Pokras et al., 2007; Cuervo et al., 2017; Eisenman, Glik, Gonzalez

et al., 2009; Eisenman, Glik, Maranon et al., 2009 ; Johnson, 2007; Mathew & Kelly, 2008). Meanwhile, specific studies on the disaster preparedness of Myanmar migrants remain limited either in New Zealand or globally. This study sought to strengthen understanding of the storm and flood risk communication needs of one of Auckland's migrant communities to inform more effective risk communication.

2.7 Chapter Summary

This literature review has scrutinised an array of literature related to the heightened vulnerability of migrants in disasters, key technical terms, and changing perspectives on disaster risk management. Risk communication, specifically, has emerged as a crucial dimension of different fields and is increasingly recognised as a key element for disaster risk reduction. A range of models related to risk communication has been discussed and social capital was found to be an effective mechanism in transferring risk messages for CALD communities. The review also describes the Myanmar migrant group in the multicultural city of Auckland, New Zealand, and knowledge gaps in previous work. The critical review in this chapter is connected to Chapter five, the discussion.

Chapter 3 Methodology

3.1 Introduction

The disaster field crosses many different disciplines. For this study on flood and storm risk communication and perceptions, the methodology applied a social science perspective. This chapter presents the rationale for a qualitative study and the paradigm used. It covers the study design and concludes by describing the ethics approval process.

3.2 The Rationale for Qualitative Descriptive Study

This study applied a qualitative descriptive (QD) approach. Lambert and Lambert (2012) argued that this design is appropriate for emerging researchers to defend their research. They also suggested that QD research is well-suited for examining experience-related issues and providing interpretive analysis, as well as having more adhesion to the data than other approaches. As Sandelowski (2000) noted, questions starting with 'wh' are well-suited for examining participants' experiences, opinions, worries and motives. The research question 'What are the flood and storm risk communication, perceptions, and interpretations of Myanmar migrants in the context of New Zealand, Auckland?' is appropriate for investigation with a QD approach. Lambert and Lambert (2012) also added that QD studies are useful for identifying the feelings, understandings, and knowledge of an individual or group of individuals. Similarly, Sandelowski (2000) and Neegaard, Olesen, Andersen, and Sondergaard (2009) noted that QD studies are a clearer approach to understanding participant experiences. Having a similar convenient language shared between the researcher and the interviewees is beneficial as it is an efficient medium for conducting a simple QD study (Sandelowski, 2000). The researcher is an international student from Myanmar and was working as a volunteer Burmese language teacher for the children of the Myanmar community in Auckland. The familiarity between Myanmar community and the researcher made it possible to conduct the interviews and was of great value for enriching the quality of the research because she shared the same language.

3.3 Research Paradigm

The researcher subscribes to the interpretive paradigm. According to Creswell (2014), a worldview or paradigm is a basic theme of beliefs in guidance of action and

has a non-specific philosophical purpose in seeing the world's nature. The interpretive paradigm allowed the researcher to understand the cultural and historical perspectives of the participants and different meanings (Grant & Giddings, 2002). Exploring the opinions and experiences of the interviewees required the researcher to embrace multiple realities as her ontological assumption (Flick, 2004), while constructionism was the epistemological stance of this study (Crotty, 1998). This was because the research objectives were informed by participants views via semi-structured interviews. To understand the flood and storm risk communication and perceptions of the participants, it is imperative to interpret their voices through this approach.

3.4 Research Design

3.4.1 Overview

As a QD approach informed this study, the approach focused attention on interpreting participants' responses and expressions. This is because it was viewed as "the least theoretical" approach of all qualitative research (Lambert & Lambert, 2012, p.2). The study was undertaken in Auckland, New Zealand, due to a higher number of Myanmar migrants residing in Auckland than other parts of the country. The COVID-19 pandemic represented an unprecedented as well as an unexpected event during the research time frame. This necessitated that data collection took place remotely via Skype and Facebook Messenger during Alert Levels 3 and 2 in Auckland in May, and June 2020, as face-to-face communication was not possible.

3.4.2 Sampling

This QD study applied purposive sampling after determining participant inclusion and exclusion criteria (Coyne, 1997; Suri, 2011). The researcher's role as a volunteer teacher for the children of Myanmar migrants enabled her to approach potential participants and the Myanmar community president to conduct this research.

Exclusion criteria covered children and adults older than 55 years. Children were excluded as possible interviewees for several reasons. Most children of Myanmar migrants have been born and raised in Auckland. They were already familiar with disaster preparedness actions and information, based on their school curricula. In addition, since they were often the third generation of the migrant community, most could only speak in English and were too young to have had past experiences related to any disasters. Young adults up to 24 years old were also excluded to ensure the sample contained working-age adults. Older adults above 55 years were initially excluded because there were very few in the Myanmar community and most of them were

dependents. While the original age limitation was 25-55 years, it became necessary to extend the participant sample up to 60 years of age. This was necessary to gain adequate participant numbers due to the COVID-19 crisis at the time of data collection.

The researcher selected the respondents who met the following *inclusion criteria* who were:

- Aged between 25 years and 60 years, and working
- Living in Auckland for at least five years
- Three to four male and female interviewees for gender balance

The inclusion criteria were informed by the profile of most Myanmar migrants who are of working age. The purpose of the sampling approach also aimed to have equal gender representation. Furthermore, Braun and Clarke (2013) advised that 6-15 interviewees would be adequate for a master's research project.

3.4.3 Recruitment procedure

During the recruiting process, participants were informed via the community Facebook page as well as by posting an advertisement at Glen Innes Buddhist monastery about the proposed research project and recruitment. The recruitment letters, in both English and Burmese, are attached in Appendix A and B, expressing the voluntary nature of the research. The anonymity of the project is explained in the Participant Information Sheet (PIS) in Appendix C and the consideration time for participation was two weeks.

In the recruiting stage, potential interviewees who expressed their interest could ask any question to the researcher via email or phone or in person as the researcher was a volunteer teacher at a Buddhist monastery in Auckland's Panmure suburb. After addressing questions, the PIS and written consent forms (Appendix D) were sent as hard copies and via email to all potential and involved participants. Before and after participants signed the written consent form, the researcher explicitly explained important matters involving confidentiality and privacy protection. These included the use of participant numbers instead of names and confidential arrangements for data storage and disposal.

Participants ranged in age from 25 to 60 years old, comprising five females and three males. Of the eight participants, half lived in Glen Innes and two each lived in the CBD and Panmure. Six out of eight (80%) had lived in Auckland for more than nine years while 20% had lived in Auckland for nearly seven years. The participant age and gender profile are presented in Table 1.

Table 1 *Age category of migrant participants (n=8)*

| Age Category | Male | Female | Total |
|--------------|------|--------|-------|
| 20-29 | 1 | - | 1 |
| 30-39 | 1 | 2 | 3 |
| 40-49 | 1 | 2 | 3 |
| >= 50 | - | 1 | 1 |
| Total | 3 | 5 | 8 |

3.4.4 Data collection

Data collection was conducted by audio interviews via Skype and Facebook messenger. Semi-structured interviews with closed and open-ended questions used as the application of “moderately structured open-ended interviews” align with a QD design (Lambert & Lambert, 2012; Sandelowski, 2000, p. 77). Semi-structured interviews also provide a flexible tool to capture people’s voices and the way they interpret their experiences (Rabionet, 2011). Similarly, individual interviews sought to capture different voices and the difficulties of different adult migrants. Since probing questions were essential, two pilot interviews were initially performed. This first step helped the researcher to refine and improve the indicative interview questionnaires which are attached in Appendix E.

Individual interviews were of 25-35 minutes’ duration. They included audio-recording with the permission of participants and the use of an interview guide in order to facilitate the process. Each participant responded to a question set involving around eight questions and these were done in the Burmese language. Throughout the interviewing process, the researcher engaged with participants in an informal, friendly way as this was vital for collecting historical information and enabled the researcher to control the ordering of questions (Creswell, 2014). Recorded verbatim data collected in Burmese were transcribed, followed by back-translation (Chen & Boore, 2010). The respondents were asked to approve certain steps of the research such as validating the accuracy of their interview transcripts prior to data analysis and the emerging themes before results were compiled.

3.4.5 Data analysis

Following transcription of the interviews, the researcher worked on back-translation, with assistance and verification by a neutral bilingual Burmese researcher. The confidentiality agreement for the ‘neutral bilingual researcher’ is attached in Appendix G. As thematic analysis is well-suited to the interpretive paradigm, the

researcher used this method in the data analysis stage (Braun & Clarke, 2006,2013). According to Braun and Clarke (2013), the thematic analysis comprises the following six phases:

- (1) Familiarising oneself with the data
- (2) Initial coding step
- (3) Aggregating initial codes into themes
- (4) Reviewing and defining of possible themes
- (5) Choosing names for categories and main themes, and
- (6) Planning for a report

The researcher was increasingly able to familiarise herself with the data while she was performing these phases, including transcribing and back-translating.

Following the completion of transcription and back-translation, theme identification was carried out by a clustering process that had two steps. The first step was initial coding in NVivo 12 software. “NVivo is designed to be used from the beginning of a qualitative research project” (Hoover & Koerber, 2009, p.76). It assists the researcher in every step of the process and provides the efficiency which comes from having a similar digital process as Microsoft Word. The NVivo process first identified “child codes” (the smallest unit informed by participants’ words in the interviews) that were then grouped together under “parent codes”. However, not every parent code had child codes, as shown in the researcher’s codebook (Appendix J).

The second step was manual clustering which was informed by the NVivo coding process. The researcher and her supervisor aggregated the initial codes into themes and reviewed these initial themes. Every parent code and some child codes were grouped into possible sub-themes. The sub-themes were clustered to evaluate main themes in an integrating mind-map (Figure 2 in section 4.3), with an explicit explanation. Then the researcher and her supervisor selected the names for sub-themes or categories and main themes. Hence, to facilitate the process of coding and theme-creation, the researcher applied a combination of NVivo software and manual clustering. Identification of certain codes and themes was done after second discussions with some interviewees.

3.5 Ensuring Academic Rigor

Rigorous research should be credible, transferable, dependable, and confirmable (Lincoln & Guba, 1986). Similarly, Merriam (1998) noted that research rigor is achieved

through six main tools: triangulation, member scrutinising, peer debriefing, external audits, describing of thick data, and explicit explanation of research bias.

This study's *credibility* was achieved by the reality of the study and it is achieved by well-developed research techniques, peer review, and long-term engagement (Lincoln & Guba, 1986; Shenton, 2004). Peer review involved meetings of researchers and supervisors to brainstorm about themes and sub-themes. The semi-structured questions of individual interviews also supported credibility since the interviews gave an actual response to the interviewer (Shenton, 2004).

Transferability means the demonstration of external validity and appropriateness of research findings in different locations (Shenton, 2004). The researcher ensured enriched writing for further information sharing because thick describing of data and purposive sampling were helpful tools for attaining transferability (Lincoln & Guba, 1986).

Concentration on a consistent and reliable study provides indicators of *dependability* (Lincoln & Guba, 1986). All research-related items such as recordings, field notes, audit trail, transcribed documents, and translated drafts were safely kept by the researcher to make sure of the study's reliability (Creswell, 2013). The researcher performed member checking that is reviewing of participants' views to validate dependability (Creswell, 2013; Lincoln & Guba, 1986).

Confirmability ensures the project is neutral (Krefting, 1991) and that the study conducted has objectivity (Lincoln & Guba, 1986). This study focused on a detailed description to attain confirmability.

3.6 Ethics Application and Amendment

3.6.1 Overview of the process

Ethics application was essential in this qualitative study due to the responsibility of the researcher to respect the participants' rights, privacy, and welfare (Berg, 2004). According to Snook (2003), key ethical issues include written or verbal consent, appropriate preparation for and management of a participant having an emotional crisis, and maintaining confidentiality, and privacy. In this context, the researcher avoided the likelihood of harm to respondents through the approaches described below.

The involvement of the participants was *voluntary* with the right to withdraw at any time prior to the data analysis stage. The interviewees were informed explicitly about the utilization of participant numbers instead of names. The researcher delivered the recruiting advertisements by posting them in a Burmese monastery in Glen Innes,

Auckland, and via the community Facebook page. The recruiting letter outlined the dissertation research and requested the voluntary participation of Myanmar migrants in the interviewing process. It also included the inclusion and exclusion criteria of the participants and was written in both English and Burmese.

After the recruiting stage, the participants who expressed their interest were contacted and sent the PIS and *written consent* form via emails. Before and after signing the written consent form, the confidentiality of the research-related data and the benefits to the participants, the wider community, and the researcher were explained in a friendly way via the PIS as well as discussed through phone calls. After obtained the interviewees' signatures, the researcher retained all the written consent forms.

According to *participant's rights*, they could withdraw, refuse any questions, and pause in the middle of answering to reduce the possible psychological harm. Furthermore, their wishes, opinions, interests, perspectives, and privacy were prioritized. Despite the plans for the use of counselling services at Auckland University of Technology (AUT), the participants did not experience any discomfort or risks throughout the interviewing process.

3.6.2 Compliance with ethics requirements and Treaty of Waitangi expectation

This research was approved by the Auckland University of Technology Ethics Committee (AUTEC) on 20 April 2020 (AUT Reference number 20/15) as shown in Appendix H. The researcher gained the support letter from the Myanmar Gonye association (Appendix F) before commencing the research.

In this context, the study sought to respect the *Treaty of Waitangi* and its principles of partnership, participation, and protection. With specific respect to a *partnership*, the research was undertaken collaboratively with migrants from the Myanmar community. It sought to develop actionable knowledge and insights which will guide the future improvement of flood and storm risk communication. The research was also designed to respect the rights of all participants, including their access to information on the outcomes of this project. Similarly, in terms of *participation*, study participants were involved voluntarily with the right to withdraw at any time before the data analysis stage. They could decline to answer to any question and to pause the response if they felt uncomfortable at any stage of the interviewing process. Moreover, every effort was made to *protect* the privacy of the participants. First, before obtaining written consent, potential participants were encouraged to ask questions and to raise any concerns so that the researcher could address them. Second, participant identities were protected by using numbers instead throughout the research process. Additionally, the researcher

and her supervisor kept all the data and research-related documents (both electronic records and hard copies) confidential. Data storage and disposal plan complied with AUTECH's protocols. Lastly, all the steps for confidentiality and privacy protection were explained to all involved participants before and after signing the written consent form.

3.7 Research Output

This research project was submitted for cross-checking by academic staff. The researcher intends to publish her research findings in a peer-reviewed international journal.

3.8 Chapter Summary

The chapter described the methodology used, specifically a QD approach, embedded within the interpretive paradigm. It outlined the sampling approach, recruitment procedures, and measures taken to ensure ethics compliance. The chapter also described the data collection process and the analytic methods used.

Chapter 4 Findings

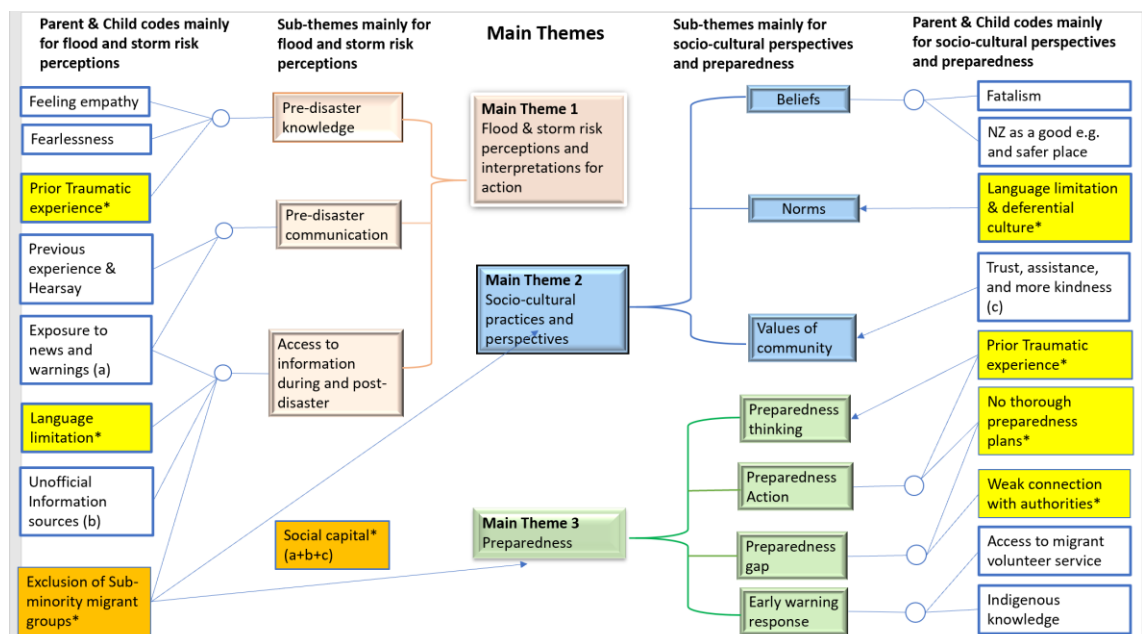
4.1 Introduction

This study sought to examine the flood and storm risk perceptions and awareness of Myanmar migrants living in Auckland. It was undertaken in 2020 during the COVID-19 pandemic. Despite difficulties in data collection due to COVID-19, the researcher was able to complete her interviews and subsequent analysis. Since the profile of the participants interviewed has been described in section 3.4.3, this chapter revisits the process involved in identifying themes and sub-themes related to flood and storm risk awareness by Myanmar migrants. It continues by presenting interview findings in relation to key preparedness and risk communication themes and concludes by applying these findings to the research questions.

4.2 Identification of Main Themes and Sub-themes

The NVivo coding process produced a rich collection of interview responses on Myanmar migrant flood and storm risk management that could be clustered into main (primary) themes and associated sub-themes. This process revealed three main and ten associated sub-themes as shown in the researcher's codebook (Appendix J). These were then clustered and organised by the researcher and her supervisor to create an integrating mind-map as shown in figure 2, below.

Figure 2 Mind-map of main themes and sub-themes related to migrant flood and storm risk communication



Note. *Knowledge gaps and cross-cutting issues

This depicts the three main themes, flood, and storm perceptions (Theme 1), socio-cultural perspectives and perspectives (Theme 2), & preparedness (Theme 3). Their associated sub-themes and nested dimensions are shown on the left of the figure (for flood and storm risk perceptions) and on the right (for preparedness and socio-cultural perspectives). In some cases, codes are shown on both sides, while others represented only on one side.

One exception in the mind-map was the exclusion of sub-minority migrant groups which was related to and led into all three main themes. The second exception was social capital, depicted as a separate theme that was informed by the combination of parent and child codes, namely exposure to news and warnings, unofficial information sources, and trust, assistance, and more kindness.

Figure 2 also highlights the ten sub-themes that emerged from participant interviews. These ranged from the role of pre-disaster knowledge, including previous traumatic experiences, to the effects of cultural beliefs, norms, and values on storm action and response. A summary of main themes and sub-themes is depicted in Table 2. This is followed by supporting evidence from participant interviews.

Table 2 *Main Themes and Sub-themes*

| Main Theme 1: Flood and storm risk perceptions and interpretations for action | |
|--|--|
| Risk perceptions, interpretations, and understanding based on previous experiences and familiarity of risk profile in the current place | |
| Sub-themes | Descriptions |
| A) Pre-disaster knowledge | Participants' knowledge related to flood and storm risk before and after arriving in New Zealand |
| B) Pre-disaster communication | How participants seek information, communicate, and face problems before a flood and storm-related event in Auckland |
| C) Access to information during and post-disaster | How participants will seek information during and after a disaster |
| Theme 2: Socio-cultural practices and perspectives | |
| Beliefs, norms, and values of community in flood and storm preparedness from a socio-cultural perspective | |
| A) Beliefs | Cultural beliefs of participants in understanding disaster risks |
| B) Norms | Cultural norms of the community in understanding disaster risks |

| | |
|------------------------|--|
| C) Values of community | Values of community or “community culture” to prepare themselves by improving risk communication |
|------------------------|--|

Theme 3: Preparedness

Any ideas, actions, gaps for preparation of coming flood and storm-related emergencies and different early warning responses in the current place

| | |
|---------------------------|--|
| A) Preparedness thinking | Thoughts of participants on how they would prepare in case of flood and storm |
| B) Preparedness action | Actual performance of participants in facing a flood and storm-related event |
| C) Preparedness gaps | Preparedness gaps of community in preparation of Auckland flood and storm risk |
| D) Early warning response | Different ways of participants’ response to Early warning messages |

4.3 Main theme 1: Flood and storm risk perceptions and interpretations for action

Participants described their risk perceptions, interpretations, and understanding based on previous experiences and familiarity with the risk profile of their current home, Auckland. This theme comprised the richest data, explaining the various and dissimilar experiences of migrant participants regarding floods and storms in the previous places where they had lived as well as more recent experience. For event-specific risk communication, this theme also captured the ways in which Myanmar migrants communicate and seek information before storms in Auckland as well as the barriers they face before flood and storm-related events. In addition, it answered questions about migrants’ access to information during and post-disaster.

4.3.1 Pre-disaster knowledge

Participants described their understanding and knowledge related to flood and storm risks. This applied to both learned/acquired knowledge before and after reaching New Zealand.

Before arriving in New Zealand, some personally experienced intense floods and storms while others described events based on hearsay. Since tropical Cyclone Nargis was the most devastating weather event in Myanmar, despite the lack of personal experience, most participants recognised it and discussed the lack of pre-disaster information and expressed their empathy. They also shared their own experiences about the lack of information dissemination in pre-disaster periods in Myanmar and refugee camps in Thailand.

As two participants could remember their previous experiences prior to arriving in New Zealand, these events shaped their current risk perceptions. One of these participants reported still feeling worried, with this feeling triggering action to take precautionary measures. Similarly, the other participant noted that this real-life experience made him realise and prioritise the severity of a risk. Such perceptions affected storm and flood risk awareness. As participant 7 noted, her previous traumatic experience represented a catalyst for realizing the importance of risk awareness and information.

I had this experience at my home village and still worried in my mind. I think we should be interested in news and listen to it so that we will know dos and don'ts in case of emergency. I always store dried food for emergencies. And I always keep drinking water in a big pot. (Participant 7)

Many people died and houses were destroyed under my nose. After experiencing these things because of the disasters, when I become an adult, I can categorize the severity of a risk. If one has no experience of disaster, they do not even know whether there is a risk or not. They tend to think it is a low priority. (Participant 5)

After arriving New Zealand, some participants faced small-scale flood and storm-related events and described as “*the biggest problem here in Auckland is overpassing of the water over the road in Mission Bay*” (participant 2). They discussed their lived experiences in Auckland and mentioned electricity shutdown as the second-largest difficulty in case of flood and storm here.

Compared to their previous own experiences and hearsay, they thought the disasters here are not as harsh as in their previous places where they have lived. Furthermore, some participants thought that they need not feel worried or care seriously about disasters. Alternatively, they expressed ‘no sense of threat’ or a sense of being ‘worry-free’ in their answers.

But for me, I had to struggle a lot in my past and now it is not challenging like before. So, maybe I do not feel worried that much. (participant 6)

Most participants believe the news and media are the sources for thinking there is a problem and for taking precautionary measures. Some participants commented that the

news is not in technical terms and includes instructions and which is why it is simple to follow. It was also found that some participants received exposure to environmental awareness-raising.

4.3.2 Pre-disaster communication: Auckland experience

Participants explained how they seek information, communicate, and face problems before a flood and storm-related event in Auckland. When discussing the ways of getting information, they described two sources, namely unofficial or informal information sources and access to official information and early warning. The majority of participants believed that they could look for reliable information from government media.

In addition, participants were also exposed to news and warnings from their friends, family members, co-workers, colleagues, and social media. They also found that having migrant support volunteers and having an association in the Myanmar migrant community supported them in searching for and knowing pre-disaster information. Some described the community organisation as a key source of unofficial information. While the organisation in the Myanmar migrant community in Auckland is officially known as the “Myanmar Gonye organisation”, sometimes participants called it the ‘Myanmar community’. The community leader told the researcher that this organisation was registered three years ago and now it is an official organisation in the Myanmar migrant community.

Sometimes my friends from Myanmar community tend to share the news and information as they are worried about each other.
(Participant 8)

In obtaining official information on storms and floods, most participants reported they could access information from official media such as TV news, websites, weather forecasts, and radio. Despite not mentioning a specific channel, participants tended to listen to the radio while they are driving. They were confident that all radio channels would announce emergency news or breaking news every three to four hours, if needed.

Furthermore, when seeking pre-disaster information, participants highlighted the difficulties they faced, such as language barriers, a gap in communication between the authorities and the Myanmar community association, and problems with technological access. In terms of language accessibility, most migrant participants expected to have a translation service provided due to the language difficulties faced by the majority of migrants. Some participants specifically struggled with English language proficiency on their own, while others noted the language barrier for older members of the migrant

community. Although some were fluent in English, they highlighted the presence of English language difficulty in the community as follows.

I think maybe much more language barrier in the Myanmar community. At home, my parents can use daily English but their listening and reading skills are not fluent. Most seniors and elders have that weakness. (Participant 5)

Some migrants described their weakness in communicating with English and their dependency on their children and others for getting proper and reliable information.

So, mainly my children and volunteers retell me about the bad weather like strong wind and storm as I cannot understand the news in English properly. (Participant 4)

Interview data also revealed unexpected challenges to pre-disaster communication targeted to minority groups due to the presence of migrant “sub-minorities” within the Myanmar migrant community. According to the community leader, Karen, Kachin, and Mon communities represent small ethnic sub-minorities within the broader Myanmar community. For example, as the Karen have their own spoken and written language, they do not understand Burmese, especially written Burmese. They also practise Christianity rather than Buddhism and although most Myanmar migrants reside in Glen Innes and Panmure, the small Karen sub-community lives on the North Shore. This situation induced the unintentional exclusion of the Karen migrant minority from information dissemination and risk communication provided in Burmese to the broader Myanmar migrant community.

We have different Ethnic groups in the Myanmar migrant community. So, it will have difficulty for other ethnics to receive the information. For instance, Kachin people do not know the information in Burmese if they do not understand it. (Participant 2)

I can speak Karen (ethnic language) and Burmese. English is not too ok for me and I cannot speak it properly. So, I need to much rely on my volunteer. I know many people (e.g. Karen) who have the same weakness. If they have a problem, I asked others for them because they cannot understand Burmese and translate and share it with them. (Participant 4)

4.3.3 Access to information during and post-disaster

With regard to accessing the information during and after floods or storms, participants shared a variety of ways of doing this with the researcher. Some searched for information from government media, particularly from the “*Auckland Civil Defence website, Auckland Council, NZ Herald and New Zealand Red Cross*” (participants 3 and 5). Some interviewees replied they relied on others such as volunteers and family members, while some participants reported that their information search would depend on previous announcements in the media.

I think I will ask my volunteer for the information and having a volunteer like that is beneficial. (Participant 4)

After experiencing the strong wind as they announced or warned, I think it is over and I try not to seek any additional information.
(Participant 8)

When asked what they would do in the event of an internet breakdown, the participants agreed that the mobile phone is the main method of communication and for accessing information. Some said they would communicate with the Myanmar community association and seek the information via this route. Although some participants had no idea about how to contact the government, participant 2, the community leader, expected an emergency line would be established and explained the usual emergency line he uses.

We tend to call 111 in case of emergencies including health emergencies. According to my research, there are also emergency lines just only for the information apart from 111. They are like autoreply for the information and we need not wait for a person to answer. If we faced the break-down of the internet because of the bad situation, I expect the government is going to create an emergency line. (Participant 2)

4.4 Main theme 2: Socio-cultural practices and perspectives

Participant interviews signalled the importance of socio-cultural factors in their understanding of and preparedness for storm and flood events. They also indicated the enduring quality of these cultural characteristics. As already described in section 2.5 on migrant vulnerability, culture plays a crucial role in disaster risk reduction (Kulatunga, 2010). In this research, three sub-themes emerged in relation to socio-cultural

perspectives and practices: the beliefs, norms, and values of the Myanmar community in flood and storm preparedness.

4.4.1 Beliefs

Participants shared their cultural *beliefs* in understanding flood and storm risks. Most participants reported a sense of security staying in New Zealand because they believed it to be a safer place. As described in session 4.4.1, they described fewer difficulties related to small-scale flood and storm events in Auckland and noted that New Zealand was a good example in warning the public and delivering information in pre-event phases of storm and floods, in comparison to previous countries they had lived in.

Some participants' beliefs were also informed by their Buddhist faith. For instance, participant 6 affirmed his belief as a sense of fatalism. He asserted his belief in fate and did not think preparedness measures were vital, stating,

So, prepared things are not important for me and I think I will be alright for one or two meals. Maybe this perception is good for me but not for others. In cases of floods and storms in the future, I do not think I have an answer already. I am facing if it would happen. As a Buddhist, I believe in Karma. Or maybe the government will rescue us by a chopper (laughing) so we cannot tell. (Participant 6)

4.4.2 Norms

As described in section 2.5, cultural *norms* are behaviours established in the state of rules of conduct (Kulatunga, 2010). Study findings highlighted how cultural norms about communication adversely affected Myanmar migrants' access to information and understanding of potential storm and flood risks, for instance, one participant commented that Myanmar culture is deferential, polite, and shy in communicating with people of different nationalities. He saw difficulties in speaking out due to this shyness and worries about pronunciation mistakes. In addition, for those among the community members who speak in English all the time, expressing the judgement as "*the one who impressed only spoken English (laughing)*" (participant 6) is also part of the culture.

4.4.3 Values of community (or) a communitarian culture

Consistent with findings from other ethnic groups that value collective engagement, all participants recognised and highlighted the importance of working together as a community. This sub-theme emerged in response to the question 'What are the existing strengths of the Myanmar migrant community?'. All respondents

expressed their feelings about responsibility for improving storm and flood risk communication in the future. Some participants commented on helping each other, showing more kindness, and familiarity after establishing the Myanmar Gonye organisation, and the association's assistance.

We are helping each other in the community now as we are Myanmar. (Participant 2)

In terms of strength for having this organization, we came to know and familiar with people that we did not know previously. (Participant 6)

Other participants who were executive committee members highlighted the responsibility of sharing information. In addition to practical assistance, the participants also felt emotional support from being the community members and having an organization. Some thought the association could provide at least psychological support. One felt *"secure for me and my family since I am sticking with the community together"* (participant 8).

Obviously, 'mutual trust' is a phrase that all participants mentioned equally. Migrant participants believed in the association because of perceived benefits and feeling spiritual support. In terms of sharing information, they thought the information obtained from the organisation would be reliable.

But I feel emotional security since I am familiar with some members of this community organization and I believe they will help me if something happens to me. (Participant 3)

4.5 Main Theme 3: Preparedness

4.5.1 Overview

The essence of this final main theme relates to any thoughts, practices, voids, and responses to an early warning in preparation to confront flood and storm-related disasters. It contains four sub-themes which are preparedness thinking, early warning response, preparedness actions, and preparedness gaps. In other words, participants explained their activities including their thoughts in terms of pre-disaster preparedness and missing links that needed to be reconnected.

4.5.2 Preparedness thinking

Participants thought differently in terms of personal and house-hold level protection against floods and storms. Some participants thought about storing food, taking their smartphones, and asking someone who can give the proper instructions for preparation.

If I know a bad storm or flooding is happen, I will buy food in advance and keep it in case of emergencies. I think food storage is the main thing if something happens. (Participant 3)

However, most participants had no thorough preparedness plan in case of adversities. Lacking a detailed plan or a meeting between roommates for this situation, participant 3 admitted, *“Honestly, I have no exact plan like that (laugh) and I think I will not be involved in the group who prepare well for emergencies in advance”* (participant 3).

Honestly, I do not prepare anything, and it is alright for me if I can get escape in person (laughing) (Participant 6)

However, based on their previous beliefs about the New Zealand Government, participants were ready to follow the authorities' instructions. Although they reported not having any idea of the location to go and things to prepare if there is a flood, some migrants also expressed the view that they would follow family members and other people's ideas. When her children told her what she should do and store, participant 7 was ready to *“follow their suggestions”* (Participant 7).

4.5.3 Preparedness action

The focus of this sub-theme is what the participants practically prepared during previous adversities in Auckland and for coming potential disasters related to floods and storms. It also reflects preparedness action at the household level. Some participants kept emergency kits whereas others stored food and water to be ready for emergencies as they thought food would be the main concern.

I always store dried food for emergencies. And I always keep drinking water in a big pot. (Participant 7)

We keep necessary things such as emergency kits at home.
(Participant 5)

In terms of other preparedness measures, the participants performed, a few kept important documents and other things to be ready. *“I think we will need drinking water, preserved food, dried food, and torch lights and so that I tried to be ready for that. For important documents, I will be always ready for it like citizenships”* (participant 4).

Although a few participants responded that they would stay indoors in case of a storm, they were not certain about where to go if flooding occurred. Only one participant, the community organization leader, carried out proper preparation for himself and his family members. He displayed an understanding of the uncertainty of natural events and the responsibility he felt for delivering effective warnings for the migrant community.

We prepare for this since we arrived here. For instance, our daughter is 6 years old now and we taught her about emergency exit among 4 exits at home and how to use it. We tend to have an emergency kit for all 4 family members because of the unpredicted nature of natural hazards. As an organization, we prepare to warn the community not only written warnings but also for voice message warnings because some migrants cannot read Burmese or some do not want to read if the written warnings are too long. (Participant 2)

4.5.4 Early warning response

While discussing the early warnings they received and how they responded, a majority of the respondents found that a weather application on their smartphones helped them to know about the daily weather changes and they tended to check it for various reasons. Regarding other technological-related warnings, one participant mentioned warning notifications via text messaging. *“If severe storm will attack, via mobile SMS, text warning will be sent”* (participant 5). Participant 6 had the same opinion on this system, stating its effectiveness in delivering early warning messages to everyone. For other modes of receiving an early warning, participant 4 said that she can receive the early warning messages from her volunteer, highlighting the importance of migrant group volunteers' help for other difficulties as well.

Interestingly though, participant 6 described how he used to check the weather in a traditional way and an early warning for the bad weather for him is relying on his traditional interpretation. He learned this from older family members while he was living in Myanmar. He reported that he hardly ever checked the weather forecast on TV nor his smartphone because his assessment tended to be correct up to 80% of the time.

For example, during the sunset, just check the environment, North, East, West, and South. If you see the trace of red colour in the sky, this is a sign of good weather for this place. My elders taught me like that. Previously, my job was painting, and I did not have a smartphone. I went to my work by speculating the same way and I can say it is true about 80%. Not 100% sure though. (Participant 6)

4.5.5 Preparedness gaps

This sub-theme was discussed under the heading, 'Requirements and recommendations to achieve better risk communication in the community'. The gaps identified and suggestions made among the Myanmar migrant people varied. They indicated financial provision, sharing information, weak connections, and other needs such as training programmes. Some participants stated financial support is essential for everything including risk communication with the migrant community.

In terms of receiving information from the government, participant 5 understood that the authorities of Auckland were dealing with many communities, as Auckland is a multicultural city. Despite understanding this, he stressed the difficulty faced by senior members of the community because *"announcements are mainly in the English language"*. In addition, some participants questioned the linkage between the authorities and the Myanmar community organization, emphasising the formal status of association which was established around 2016 and officially registered. Even though the organization is too young to be recognized by the Auckland Council, they expected to get direct contact and information from the government since *"two-way communication is essential"* (participant 5).

We, Myanmar Gonye organization in Myanmar community, is a registered organization now. But we have not received the information about the emergencies via our email from the New Zealand government. It would be better if the government deliver the information to the community executive committee and told to share the community. (Participant 2)

Regarding other gaps to fill, one participant said he joined a programme called *"Disaster Resilience Capacity Building"* (participant 5) in 2019 as a young member with a refugee background in the Myanmar migrant community. This programme was arranged by Auckland Council and participant 6 explained that the programme aimed to learn about the main requirements *"in Myanmar community such as weakness and*

to teach how community participates in disaster preparedness” (participant 5). He also expressed his favourite part in this programme and his belief about needing more training to have better risk information.

4.6 Findings in relation to research questions

This study sought to explore the perceptions of Myanmar migrants on storm and flood preparedness in Auckland.

With respect to the first research focus on migrants’ familiarity with Auckland’s disaster risk profile, the findings indicated uneven understandings. On one hand, migrants accessed the mainstream warnings and information and had confidence in the government, expressing the familiarity with the emergency procedures of their new home. On the other hand, the interviews suggested an incomplete understanding of Auckland’s overall storm/flood risk profile. Due to previous perceptions from their experiences in Myanmar and Thailand, they expressed a sense of being ‘worry-free’ that prompted them to barely prepare themselves and other household members.

In terms of social and cultural barriers and enablers, there were positive and negative aspects. Cultural norms and values such as assistance, kindness, and mutual trust illustrated positive benefits for sharing warning information. While this value in the form of community support has remained strong across older migrants from Myanmar, it may also be diminishing for the younger generation raised in New Zealand. In addition, language limitations due to deferential cultural behaviour and fatalistic beliefs were also constraining factors. This was due to participant shyness in communicating in English, (their second or third language). It was also due to beliefs in accepting fate without one’s own efforts, and that may hinder initiative in receiving emergency warnings or taking preparedness measures.

The third research focus centred on the barriers and opportunities to storm/flood preparedness. Once again, research findings indicated the benefit of using indigenous knowledge in early warning, and willingness to follow the authorities’ instructions in case of storm/flood as opportunities. Nonetheless, it also highlighted the limited preparedness of participants and a weak connection in their engagement with government authorities. In this context, three main themes that addressed the research objectives were identified. Three main themes and their associated sub-themes are shown in Table 3.

Table 3 *Main themes identified in relation to research objectives*

| Research Focus | Main Themes identified | Sub-Themes |
|--|---|--|
| Research Focus 1 Exploring the familiarity of Myanmar migrants with Auckland's disaster risk profile | Main Theme -1 Flood and storm risk perceptions and interpretations for action | 1 Pre-disaster knowledge |
| | | 2 Pre-disaster communication |
| | | 3 Access to during and post-disaster information |
| Research Focus 2 Understanding the social and cultural barriers and enablers of Myanmar migrant community in flood and storm preparedness | Main Theme -2 Socio-cultural practices and perspectives | 1 Beliefs |
| | | 2 Norms |
| | | 3 Value of community (or) Communitarian culture |
| Research Focus 3 Providing insights on the barriers and opportunities for Myanmar migrants to prepare themselves by improving risk communication | Main Theme -3 Preparedness | 1 Preparedness thinking |
| | | 2 Preparedness action |
| | | 3 Preparedness gaps |
| | | 4 Early Warning response |

In addition, there were two unexpected cross-cutting dimensions, emerged from the interviews, as shown in Figure 2. These were exclusion of sub-minority migrant groups and the role of social capital. They were not expressed in the form of codes nor sub-themes but exhibited as separate dimensions that crosscut the three main themes. The exclusion of sub-minority migrant groups is a separate dimension informed by a child code, language difficulty in ethnic minority whereas social capital is a combination of three different parent and child codes which were exposure to news and warnings, unofficial information sources, and trust, assistance, and more kindness. However, these are important issues that crosscut all main themes as well as related to the research question.

4.7 Chapter Summary

Findings from participant interviews discovered three main themes, ten sub-themes, and additional cross-cutting dimensions that are vitally important in flood and storm risk communication, perceptions, and interpretations of Myanmar migrants in Auckland. The themes recognised in this study addressed the three objectives of the research question, particularly highlighting the role of culture in enabling on limiting the effectiveness of storm and flood risk communication, as well as the connection between authorities and the Myanmar migrant community. The findings also revealed two unexpected issues which were not under sub-themes or codes but were crucial in

answering the research question, cross-cutting three main themes. The next chapter discusses these issues more in-depth, relating to relevant literature.

Chapter 5 Discussion and Conclusion

5.1 Introduction

This chapter discusses the study findings on storm and flood perceptions, as viewed by Myanmar migrants in Auckland. It begins by highlighting the role of a prior experience in shaping migrants' current risk perception. This especially applies to the role of prior traumatic storm or flood experience as this can be both a barrier and an enabler towards taking protective measures. The chapter continues by examining the socio-cultural dimensions that hinder preparedness and accessing warning, information, and response, including fatalistic cultural beliefs and language limitations related to deferential cultural behaviour. However, these also include the importance of strong networks of migrant community members and families in the form of bonding social capital. This is, despite, evidence of weak linking capital with local authorities. The chapter concludes by describing implications for further research, as well as improved policy and practice.

5.2 Insights on Myanmar migrant flood and storm perception

5.2.1 Influence of prior traumatic experiences

Findings indicate that the migrants' flood and storm perceptions were influenced by many factors. These data illustrate the role of pre-disaster knowledge and communication. Pre-disaster knowledge was informed by hearsay, prior traumatic experiences, feelings of empathy, and a sense of being "worry-free". On the other hand, pre-disaster communication was informed by what they had learned from the past, combined with the exposure to news and warning.

Study findings indicated that what they remembered including Cyclone Nargis in 2008 shaped the way they viewed pre-disaster communication and current risk interpretation in their new home. The influence of prior traumatic storm and flood experience was not reflected consistently across participants. For instance, in the context of risk communication, as some participants who had a previous traumatic experience were more alert and frightened, this led to preparedness behaviour, higher risk perception, and categorization. By contrast, other migrants compared the prior experience with their lives in New Zealand, and they said New Zealand is very safe, expressing a sense of being "worry-free".

Participants shared their prior traumatic experiences which showed that as they had not forgotten what had happened, this made them more frightened and alert. They

explained that these were *terrible experiences* that now benefitted them *as a catalyst* or stimulus for taking precautionary measures or prioritising the severity of a risk. These findings aligned with the view of Christoplos (2006) who noted that previous events can be a ‘window of opportunity’ in managing disaster risk. His argument was that post-disaster experience can facilitate the promotion of DRR measures because of new risk awareness (Christoplos, 2006). This notion was further supported by the work of other scholars who suggested that, in preparing for future potential disasters, individuals’ experience can be a powerful motivator (Sheppard, Janoske, and Liu, 2012). As one example, after the 1931 Napier earthquake, the residents of Napier and the Hawke’s Bay region showed higher earthquake risk perception and preparedness than other areas in New Zealand (Hill and Gaillard, 2013).

However, this study also shows that traumatic experience may also hinder preparedness behaviour. A participant reported that his current life was more favourable than his prior difficult stay in refugee camps in Thailand. Consequently, his worry-free view of New Zealand being risk-free discouraged him from preparing for himself and his household members. In the disaster arena, such risk perceptions that limit proper protection action are often attributes of vulnerable populations (Kammerbauer & Minnery, 2019; Lippmann, 2011).

This study illustrated how risk perceptions and interpretations can vary widely, even among migrants from the same country of origin. They resonate with recent research on protection motivation theory (Babcicky & Seebauer, 2019) that “unpacked” the influence of risk perception and coping perception in private flood mitigation efforts. While they showed that “the most relevant driver of non-protective response is risk perception” (p. 1514), they also underlined the importance of participant coping perceptions. As shown by example of migrants who have high confidence in New Zealand’s government capabilities, the authors argue that such dependency and expectations on others such as public protection can lead to “a false sense of security” and be problematic (p. 1515). This was a knowledge gap in previous researches. Heijmans (2001) exhibited the individual’s perception of risk in the way that people’s experience and circumstances shaped their thoughts of taking or avoiding risks.

5.3 Socio-cultural dimensions for disaster preparedness

5.3.1 Overview

Study results underline the crucial role of socio-cultural factors in shaping preparedness actions in relation to floods and storms. These were expressed both as

enablers and constraints to action and substantially informed by existing cultural beliefs, norms, and values placed on community. For instance, some participants are less likely to prepare due to strong fatalistic beliefs. Similarly, due to the presence of strong community values, migrant trusted in one another but unintentionally excluded other migrant sub-minorities from the Myanmar migrant community. Language limitations due to the migrants' deferential cultural behaviour was also a socio-cultural constraint towards accessing risk messages and hindering of protective actions.

5.3.2 Socio-cultural enablers to disaster preparedness

Flood and storm risk information was also derived from other sources such as family members, friends, and the Myanmar Gonye association. Additionally, participants expressed feelings of more trust, assistance, and kindness by being a community member. This highlight the role of vigorous *bonding social capital*. Participants stated their feelings of being strongly connected within the community and this benefitted them in accepting emergency-related news. They reported that they could feel at least emotional support by being a community member and having an association within the community. This positive social network resonates with the concept of social capital already described in other literature (Aldrich & Mayer, 2015; Elliott, Haney, & Sams-Abiodun, 2010; Hanson-Easey et al., 2018). Of the three social capitals (bonding, bridging, and linking), the results in this study showed Myanmar migrants possessing strong bonding social capital.

Cultural enablers for disaster preparedness action also included the unexcepted applications of indigenous knowledge on weather prediction. For instance, in response to questions related to early warning response, one migrant reported applying a traditional method, taught by his elders, to check for bad weather. This observation is consistent with findings by Kenny, Phibbs, Reid, & Johnston (2015) and Phibbs, Kenny, & Solomon (2015) who described how, Māori have adopted indigenous coping techniques for their family (whānau), tribe (iwi), and society (hapū) in facing current hardships and disasters. It speaks to an important aspect of a culture where “knowledge is transferred from one generation to another” (Kulatanga, 2010, p. 307).

5.3.3 Socio-cultural constraints to preparedness

Research results indicated that limited English proficiency among Myanmar migrants posed a significant challenge in accessing mainstream messages from government channels. Many participants indicated that the language barrier was more prominent in older adults or first-generation migrants with this increasing their reliance on others such as children. The work of Hanson-Easey and colleagues (2018) had similar findings highlighting the language dependency of older migrants and women on

younger CALD members. They stated that the younger generation was positioned to acquire crucial preparatory news and warnings in terms of translating and interpreting information for older community members (Hanson-Easey et al., 2018). This connection is also found in research undertaken in these emergencies, where many adolescents and children from refugee backgrounds were seen as 'conduits for disaster preparedness' and 'translators and communicators' for their communities and households following Hurricane Katrina in New Orleans and the 2010-2011 Canterbury earthquake in New Zealand (Marlowe & Bogen, 2015; Mitchell, Haynes, Hall, Choong, & Oven, 2008, p. 269; Wachterndorf, Brown, & Nickle, 2008, p. 457).

While some participants found it easy to communicate and access information, others expressed their weakness in English proficiency since major warnings and information are in English. In addition, the deferential culture and shy behaviour of Myanmar migrants in New Zealand compound language limitations. This was particularly pronounced for mid-life immigrants. Other cultural behaviours such as worrying about pronunciation mistakes and other people's judgement are also factors that limit communication in English.

Another key driver to cultural constraints in emergency risk communication and protective action is *fatalism*. According to Rui (2012), fatalism is a cultural belief based on religious faith where people tend to presume that their future is shaped by Fate, not by their perseverance. Such thinking and associated behaviour were illustrated in this study, with some participants viewing their risk and safety during storms and floods as being shaped by fate, rather than their own effort. Their disinterest in taking preparedness measures is partly explained by Rogers' (1975, 1983) Protection Motivation Theory (PMT). The PMT (in original and expanded models) argues that "individuals" coping appraisal of or threat such as a flood or storm informs his/her response actions (Bubeck et al., 2018; Chen, 2020; Rogers, 1975). In this study, those with fatalistic beliefs were also less likely to take proactive storm/flood measures, given their view that fate, rather than their own actions would determine the outcome for their safety.

Behavioural models such as the PMT and Protective Action Decision Model (PADM) (Lindell & Perry, 2012) underline the importance of risk perception for decision-making in the face of impending threats. However, they do not profile the influence of socio-cultural forces, including the crucial role of social capital illustrated in this research. For instance, Kulatanga's (2010) examination of culture on disaster risk reduction and Hanson-Easey et al.'s focus on social capital (2018), both help situate participant responses from this study in the socio-cultural context of an ethnic migrant minority in Auckland.

One unexpected finding that cut-across the three main themes in the study was that there are migrant sub-minorities in this marginalised Burmese migrant group. Some participants noted that there are minority groups within the broader Burmese community with the dominant group being Karen. While the Karen originate in Burma, they have their own spoken and written language, practise Christianity, and mainly live on Auckland's North Shore. This is some distance from the main Burmese community in Auckland. Most Karen has a limited understanding of the Burmese language, including any written emergency warnings and announcements disseminated in Burmese. Thus, they are different from the majority of Burmese migrants linguistically, spatially, and in terms of faith. Consequently, this situation has resulted in their being overlooked or unintentionally excluded by authorities in dissemination of risk information intended for the Burmese community. This finding of a migrant sub-minority underlines a gap in existing literature despite the awareness of the impact of marginalisation on minority ethnic groups (Gaillard, 2010; Phibbs et al., 2015; Wisner et al., 2012). It also highlights the drawback of viewing migrants from the same country as homogenous.

5.4 Barriers and Opportunities for Preparedness

5.4.1 Introduction

Previous research has documented that migrants are less likely to perform protection practices in the readiness phase of a disaster (Carter-Pokras et al., 2007; Eisenman, Glik, Maranon et al., 2009; Fothergill et al., 1999; Schaur et al., 2017). In this study with Myanmar migrant interviewees, participants described factors influencing their protective activities were linked to an 'overly-optimistic view' and confidence in a trustworthy government. This section describes the barriers and opportunities related to Myanmar migrants' preparedness for floods and storms in Auckland, including implications for risk communication.

5.4.2 Barriers to preparedness

In this study, only one participant described taking preparedness measures for storms and floods. Apart from socio-cultural constraints, findings indicated that a *sense of being 'worry-free'* as well as an *overly-optimistic view* were contributing factors to hindering preparedness practices. The overly-optimistic view is based on the optimistic ideas of a person who presumes the likelihood of harm will be less serious for him or her in their present situation (Helweg-Larsen, 1999; Paton, Smith, Daly, & Johnston, 2008). In this investigation, some participants assumed there would be a small chance of being affected by an intense storm or flooding. This sense of being worry-free inhibited them

from taking precautionary measures, resonating with Spittal et al. (2005) who argued that an overly-optimistic view may pose a barrier to preparedness measures.

Participants' feeling of overconfidence also depended on their current status of living in New Zealand which they perceived as a safer place than where they had lived previously, aligning with the perception of international students in Thorup-Binger and Charania's (2019) work. The confidence that the migrants felt seemed to be mirrored by a comparison between their current and previous places of residence, which they experienced or heard about lacking effective risk information in the pre-disaster phases. However, such confidence and the over-optimistic view are also problematic, as it may interfere with protection action.

5.4.3 Opportunities for preparedness

In addition to bonding social capital, this study identified other available resources that represent opportunities to enhance storm and flood preparedness action and advance relevant knowledge of Myanmar migrants. In seeking information, most participants found that they could access information from official media such as TV news, websites, weather forecasts, and radio. This indicates that migrants are familiar with accessing information and understand the normal emergency procedures of their current home, Auckland in the face of non-intense storms and floods. However, as described in section 4.7, participants might not be entirely familiar with the risk profile of their new home or their understanding was incomplete because their perception was affected by their experience in previous countries.

This research also highlights how participants have confidence in the government. Their belief in a *trustworthy government* enabled them to be ready to follow the authorities' instructions in times of stress. This emotional state resonates with the observation of Khan et al. (2017) who noted that trust-building is a necessity as it is crucial in both interpreting risk and in the decision-making process. Additional opportunities were also revealed, including the access to migrant volunteer services and a disaster preparedness training programme for migrants, described in sections 5.5.2 and 5.5.3.

5.5 Research implications and recommendations for Policy and Practices

5.5.1 Cross-cutting dimensions

While this research has explored a wide range of flood and storm preparedness themes, if it were viewed critically, the study's findings highlight four dimensions. These are four cross-cutting concerns that relate to all questions or themes - the role of prior

experience, the pervasive role of culture including that of migrant sub-minorities, the enablers or barriers around language, and the importance of social capital. Among four dimensions, the issue of excluding migrant sub-minorities from the same country of origin and the importance of social capital were not specific codes nor sub-themes but separate dimensions, as mentioned previously in section 4.7.

The influence of prior experience was reflected in several interviews. Although migrants may have experienced a previous flood or storm ten or twenty years ago, these events still shaped their current risk perceptions and preparedness behaviours, involving risk interpretation.

Similarly, while cultural factors are recognised as being beneficial in accessing risk information, study findings also showed that these can be an impediment to disaster preparedness. One key cultural issue referred to migrant sub-minority that crossed all themes. This proved to be an unexpected finding.

This research also revealed the role of language that crossed every theme and was crucial since it both triggers limited access to risk messages and hinders protective actions.

Consistent with the qualitative research of Hanson-Easey et al. (2018), the findings demonstrated the importance of social capital in which vigorous bonding capital can function as a socio-structural tool in sharing risk information. However, the study also highlighted the weakness in terms of bridging and importantly, linking capital between the relevant authorities and the Myanmar community.

5.5.2 Recommendations

Recommendations for strengthening storm and flood preparedness capabilities of migrant groups are based on the research's findings and relevant academic literature. In addition to resources already described, the study identified the areas that could be further expanded. These include disaster preparedness and English training programmes and a more purposive effort in linking social capital between the authorities and the Myanmar community. More important, the research findings could also add value to New Zealand's National Disaster Resilience Policy.

First, more *training programmes* regarding flood and storm preparedness could be arranged by relevant institutions to reach-out to migrant groups like the Myanmar community. As discussed in section 4.6.5, although the 'Disaster Resilience Capacity Building training programme 2019' was viewed by interviewees as a marvellous opportunity, however, there was only this one opening available for the Myanmar community. This suggestion of on-going training programmes resonates with existing

literature. However, not only people's knowledge about disaster risks is increased because of "education provided by emergency planners", this interaction also helps develop trust through empowerment (Eisenman et al., 2007, p.113; Khan et al., 2017).

The second priority is for *English language programmes* since lack of English proficiency was identified as an inevitable barrier for older migrants to actively engage in risk communication. The researcher explored this further with a senior advisor of Myanmar origin, responsible for refugee and migrant support group from Ministry of Education (personal communication, August 10, 2020). The senior advisor described how, despite the English programmes being freely available in Auckland as part of New Zealand's resettlement strategy (specifically at the Mangere Refugee Centre and AUT Centre for Refugee Education), migrants opted for work which did not need English language skills. This could explain persisting difficulties with communication in English (Ministry of Business, Innovation & Employment, 2012). To address this, the research findings suggest that Myanmar migrants are provided with on-going English programmes.

A third and extremely important issue is closing the gap between the authorities and the Myanmar community – by strengthening linking social capital. For instance, some participants discussed a lack of direct contact from the authorities to the Myanmar community organisation, despite its registered association several years earlier. It is necessary to establish a connection between the migrant community and the government body since the findings demonstrated the weak connection with government authorities. In this context, the study recommends that promoting two-way communication can help to tackle this gap since it enhances public participation and builds reciprocal understanding between two parties (Benadusi, 2014; Westcott et al., 2017).

Practically, research findings indicated that migrant participants accessed risk messages and warnings partly through the Myanmar Gonye *association*. Despite being a small association, which might not be visible to relevant authorities, numerous statements demonstrated how the association served as an intermediary in sharing emergency news and information, as well as helping community members in times of need. According to Hanson-Easey et al. (2018), engaging such community resources is key to efficiently transferring risk information and enhancing community resilience. This study suggests the association could act as a bridge between community and government to raise risk awareness and to strengthen risk reduction measures in the future.

This study also profiled the vital role of migrant *volunteers* in informing Myanmar migrants of early warning news and warnings as well as in taking preparedness practices. While the disaster field has a long history of volunteerism (Fernandez, Barbera, and Van Dorp, 2006), New Zealand's migrant support volunteer programme is a service aimed at fostering a more inclusive atmosphere and alleviating the unique barriers faced by migrants (Volunteering New Zealand, 2019). However, as such volunteers do not yet have specific training in disaster risk management, it is recommended that migrant support volunteers could be a second bridge to help in reinforcing linking capital.

Last, the results could contribute to the better implementation of New Zealand's National Disaster Resilience Strategy. Since CALD communities are growing in New Zealand, being a multicultural society brings both benefits such as knowledge and innovation as well as insights on how to respond to cross-cultural challenges. By considering of vulnerability and local capability across the 4Rs for the Myanmar migrant community, this study adds detail on one of the many migrant groups living in New Zealand (National Emergency Management Agency, 2019).

The findings specifically highlight the importance of local and other authorities working closely with and consulting the leadership of the Myanmar community and to be mindful that even within migrant groups, there may be further linguistic and cultural diversity. In this instance, results indicate that migrants from Myanmar are not homogenous – in language, faith, or residential location – and that careful consultation with community leadership is needed to tailor disaster risk-related support from government.

5.6 Conclusion

5.6.1 Revisiting findings and their interpretation

Disaster research indicates that migrants are particularly vulnerable in times of adversity, especially during floods and storms. Such vulnerability is further exacerbated for small, marginalised groups including the Myanmar community in Auckland. In this context, the study has contributed to the advancement of knowledge about how “invisible” migrant groups like Auckland's Myanmar community perceive and prepare for floods and storms. It was carried out in 2020 by applying a qualitative descriptive research design framed within an interpretive worldview, and implemented, using semi-structured interviews. Due to constraints resulting from COVID-19, interviews were conducted remotely, by internet technology or mobile phone. To examine the familiarity

of Myanmar migrants with Auckland's disaster risk profile, the study specifically explored how migrants sought flood and storm risk information in their new home. Study results highlighted the crucial roles of culture, language, social capital, and prior flood- and storm-related traumatic experience in shaping their risk perceptions and preparedness actions.

Cultural factors were influential across warning and preparedness phases. These were reflected in the use of indigenous knowledge from Myanmar to “predict” incoming weather. They were also expressed in *beliefs* that discouraged preparedness, including fatalistic views towards possible danger attributed to their Buddhist faith, and behavioural *norms* of politeness and deference to government authorities. Similarly, results underlined the widely shared *value* of collective support and communication across the Myanmar community, expressed through sharing news and warnings. However, the study also revealed two unexpected cultural disconnects. These were due to the presence of several Myanmar ethnic sub-minorities, that while sharing the same country of origin, had their own distinctive languages, cultures, and faiths. These groups were unintentionally excluded from community-delivered flood and storm risk communication messaging.

The research findings highlighted the importance of *language* for accessing official and real-time weather and flood warning information. While almost all those interviewed checked weather applications on their smartphones, older Myanmar migrants' access to information was constrained due to their limited English-speaking capability.

The role of *social capital*, both as enabler and barrier to flood and storm risk communication, was also evident, underlined by the strength of bonding capital within the Myanmar community. However, it also indicated shortcomings in bridging, and especially linking social capital between the community and local authorities. This role of social capital not only applies to disaster risk management for hydrometeorological hazards, but also to other threats. For instance, effective communication and mobilisation of social capital have been acknowledged as forming the core of New Zealand's successful COVID-19 response (Cameron, 2020; Williams, 2020).

Last, this research has highlighted the enduring effects of *previous traumatic experiences* in storms and floods on migrant perception risk in their resettlement home. This was reflected in enhanced awareness to take protective action. However, in some instances, the prior experience served as a barrier to precautionary measures due to perceptions of New Zealand being comparatively safe and secure.

5.6.2 Study strengths and limitations

As there is limited existing research on flood and storm preparedness of Myanmar migrants, this study represents a new contribution to an understanding the unique risk communication, perceptions, and interpretations of this “invisible” migrant group in Auckland. This research provides valuable insights not only for researchers in the disaster field but also for CALD communities of New Zealand who seek to strengthen their policies and practices in disaster risk reduction. Such insights were enabled due to both participants and researcher speaking the same language – Burmese. This created a positive relationship helped with theme identification.

However, the researcher faced limitations. For instance, as the participant pool and data collection were based in Auckland only, this represented a geographical limitation to this present study. As a result, the findings cannot be generalised to the Myanmar migrant population in New Zealand. The lack of literature related to disaster preparedness of migrant minorities represented a second constraint. This was challenging for the researcher in searching for specific literature to explain her findings, particularly on migrant sub-minority challenges in the disaster risk field.

The last limitation was the unexpected event, the COVID-19 outbreak, which occurred before data collection. This resulted in delays to the research ethics approval process. New Zealand’s Alert-level requirements also shifted plans from face-to-face interviewing to online interviews, limiting the quality and depth of the interviews, including body language. The lockdown alert level announcements in New Zealand due to the COVID-19 crisis also increased participants’ concern, hampering the start of the data collection.

5.6.3 Areas for future research

At the beginning of this dissertation, the researcher described two forces that are impacting the world. These are rising risk of climate extremes and accelerating population mobility. Furthermore, urban areas are increasingly culturally diverse. To address these problems, approaches to both climate change adaptation and disaster risk reduction need to be more inclusive.

In the context of such growing cultural diversity, urbanisation, and climate change, this study provides valuable insights on storm and flood awareness and protective actions for less visible migrant groups like the Myanmar community in Auckland. It has highlighted gaps in understanding about migrant sub-minorities within the Myanmar migrant community and cautions against generic approaches that view ethnic migrant minorities as homogeneous. This research has also underlined shortcomings as

limitations in existing models. These knowledge gaps underscore the need for further research.

This study is also a unique addition to social science research in the risk communication domain for migrant minorities. This includes greater attention to integrating issues of social capital with prevailing risk communication theories and approaches. It also highlights the value of further studies to address gaps in community storm and flood awareness-preparedness actions, and particularly the crucial relationships between socio-cultural perspectives and disaster risk reduction in the case of less visible ethnic migrant communities.

6 References

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7 Appendices

Appendix A: Recruiting letter (English version)



An Advertisement/Invitation for Taking Part in A Research Project

Mingalarpar!

My name is Su Myat Kyaw and currently completing a master's degree in emergency management program at Auckland University of Technology. I'm also teaching migrant Myanmar children as a volunteer teacher at Glen Innes Buddhist monastery every Sunday.

I'm interested in conducting a research project in Myanmar community, thinking about migrant emergency management.

Would you be willing to help me?

To take part in this study,

- 1- You need to be between 25 and 55 years
- 2- You need to live in Auckland at least 5 years and
- 3- You need to be an adult Myanmar migrant

However, 1-children and 2-people over 55 years will not be able to take part in this research project.

✓ If you want to take part in my research project, please contact me to make an appointment for an interview which will be via Skype or Microsoft Team video calls

- ✓ You will be asked to sign a consent form before we begin the interview. I'm sending consent form via email.
- ✓ It is unlikely that there will be any significant risk if you do feel uncomfortable with the particular questions you don't want to answer
- ✓ I'm going to contact the first 6-8 people who express their interests and arrange the convenient time for an interview

Looking forward to seeing your response soon!

Su Myat Kyaw (Postgraduate student)

Master of Emergency Management, Auckland University of Technology

Email – qdf8124@autuni.ac.nz, Ph- 022 588 3418

Appendix B: Recruiting letter (Burmese version)

Auckland University of Technology
Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999
www.aut.ac.nz



🌸 သုတေသန အင်တာဗျူးအတွက် ပါဝင် ကူညီပေးရန် ဖိတ်ကြားလွှာ 🌸

မင်္ဂလာပါရှင်။

ကျမနာမည် မဆုမြတ်ကျော်ပါ။

လောလောဆယ် Emergency Management program နဲ့ Auckland University of Technology

မှာ မာစတာတန်း တက်ရောက်နေပြီး သုတေသန စတင်ရတော့မှာ ဖြစ်ပါတယ်။

Glen Innes ဘုန်းကြီးကျောင်း - Sunday school မှာ ကလေးတွေကို volunteer teacher အနေနဲ့ မြန်မာစာ သင်ပေးနေပါတယ်

ကျမက Myanmar community ကို migrant emergency management နဲ့ပတ်သက်ပြီး သုတေသန ပြုလုပ်ဖို့ စိတ်ဝင်စားသူ တယောက်ပါ။

ကျမရဲ့ သုတေသန ဆိုင်ရာ interview လေးတွေမှာ တတ်နိုင်သမျှ ကူညီပါဝင် ဖြေဆိုပေးကြဖို့ ဖိတ်ကြားပါရစေ ရှင်။

သုတေသနမှာ ပါဝင်ဖြေဆိုချင်တဲ့ သူများ ဟာ

၁- အသက် ၂၅ မှ ၅၅ နှစ်အတွင်း ဖြစ်ရပါမယ်

၂- အနဲဆုံး Auckland မှာ နေထိုင်တဲ့ သက်တမ်း ၅ နှစ် ရှိရပါမယ်

၃- အသက်ပြည့်ပီး - adult Myanmar migrant ဖြစ်ရပါမယ်

> ကလေးသူငယ်များနှင့် အသက် ၅၅ နှစ်ကျော် လူကြီးများကို ဤသုတေသနမှာ ပါဝင်ဖြေဆိုရန် ရွေးချယ်မည် မဟုတ်ပါ

> သုတေသန interview မှာ ပါဝင်ချင်တယ် ဆိုရင် အောက်မှာ ဖော်ပြထားတဲ့ ဖုန်း (သို့) email က တဆင့် ကျမကို ဆက်သွယ်နိုင်ပါတယ်

> Interview မေးခွန်းများကို Skype (သို့မဟုတ်) Microsoft Team Video calls ပုံစံဖြင့် ဖြေဆိုပေးရမှာ ဖြစ်ပါတယ်

> လူကြီးမင်းတို့က interview process မစခင်မှာ ကျမပေးပို့မယ့် consent form မှာ လက်မှတ်ရေးထိုး ပေးရပါမယ်

> interview ချိန်အတွင်းမှာ မဖြေကြားလို/နိုင်တဲ့ မေးခွန်းများကို မဖြေကြားခြင်းအတွက် ဘယ်လို အကျိုးသက်ရောက်မှုမှ ရှိမှာ မဟုတ်ပါဘူး။

> သုတေသနမှာ ပါဝင်ဖို့ ပထမဆုံး ဆက်သွယ်လာသူ - ၆-၈ ယောက်ကို ရွေးချယ်ပြီး interview
အတွက် အဆင်ပြေမယ့် အချိန် ဆက်လက်စီစဉ်သွားမှာ ဖြစ်ပါတယ်။

ပါဝင်ကူညီပေးနိုင်ကြမယ်လို့ မျှော်လင့်ပါတယ်

မဆုမြတ်ကျော်

Postgraduate student

Master of Emergency Management

Auckland University of Technology

Email- gdf8124@autuni.ac.nz

Contact number- 022 588 3418

Appendix C: Participant Information Sheet (PIS)



Participant Information Sheet (PIS)

Date Information Sheet Produced:

April 2020

Project Title

A qualitative descriptive study in Auckland, New Zealand: Understanding flood and storm risk communication, perceptions and interpretations of Myanmar migrants.

An Invitation

Mingalabar!

My name is Su Myat Kyaw. I am currently completing a master's degree in emergency management at the Auckland University of Technology (AUT) and volunteering as a teacher for migrant children at Glen Innes Buddhist monastery. I am interested in conducting a research in Myanmar community, thinking about emergency management for migrant community.

Would you be willing to help me?

The aims of the research project are:

- 1- To explore the familiarity of Myanmar migrants with Auckland's disaster risk profile
- 2- To understand the cultural and social barriers and enablers of Myanmar migrant community in flood and storm preparedness
- 3- To provide insights on the barriers and the opportunities for Myanmar migrants to prepare themselves by improving risk communication.

What is the purpose of this research?

The research aims to explore the familiarity of Myanmar migrants with Auckland's disaster risk profile, to understand the cultural and social barriers and enablers of Myanmar migrant community in flood and storm preparedness and to provide insights on the barriers and the opportunities for Myanmar migrants to prepare themselves by improving risk communication. This research will benefit you to share your experiences, opinions and perceptions of current flood and storm risk profile of Auckland.

The wider community will benefit from this research by having better and improving risk communication and self-preparedness in the future.

The findings from this research will be used for various outputs such as a dissertation, research reports, journal articles and better flood and storm risk communication in the future.

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

You have been invited to participate in this study because you are an adult migrant from Myanmar community.

Hence, participants who meet the following inclusion criteria (n=6-8) are:

- Working age groups between 25-55 years
- 3-4 male and female participants to have equal gender representations
- Who have been residing in Auckland for at least 5 years

For exclusion criteria, the children and the elderly people over 55 years will not be selected as participants due to a number of reasons. First, the children who are third generation of the immigrant community, will be excluded since they were born and raised in Auckland and have already familiar with the preparedness practices of disasters in the school curriculum. Second, the elderly people over 55 years will not be chosen as their number is relatively small in the Myanmar community.

The potential participants who express their interests to the primary researcher, Su Myat Kyaw, will be contacted via email or phone for making an interview appointment on Skype or Microsoft Team video call for the research.

How do I agree to participate in this research?

To participate and be included in this research project, you must sign the Consent form which was sent along with this document. You can send the Consent form back to the researcher after placing your signature electronically or after scanning the form together with your signature in printed document.

It is unlikely that there will be any significant risk if you do feel uncomfortable with the particular questions you don't need to answer. Anyone who choose not to sign the consent form will not be included in this research.

Your participation in this research is voluntary (it is your choice) and whether or not you choose to participate will neither advantage nor disadvantage you. You are able to withdraw from the study at any time. If you choose to withdraw from the study, then you will be offered the choice between having any data that is identifiable as belonging to you removed or allowing it to continue to be used. However, once the findings have been produced, removal of your data may not be possible.

What will happen in this research?

This research involves Skype or Microsoft Team interviews in the form of video calls that will be held at a convenient time for you. In this interview, you have to answer a range of questions related to flood and storm risk communication in Auckland. It is not likely that there will be any significant risk if you do feel uncomfortable with the particular questions you don't want to answer. The interview will be recorded electronically with your permission and the interview notes will be taken.

What are the discomforts and risks?

It is not anticipated that you will experience any notable risks or discomfort during your participation in this study.

How will these discomforts and risks be alleviated?

In the very unlikely chance that you experience any discomforts or risks, you will have access to counselling services at AUT.

The researcher is able to refer adult participants who needs counselling to the AUT Health Counselling and Wellbeing because it offers three free sessions of confidential counselling for an AUT research project.

AUT offer free counselling services and mental health support. You can have free counselling services via Microsoft Team video calls as well. Sessions are confidential and are delivered by professional counsellors. All AUT counsellors are professionally trained and are members of their relevant professional body. You can bring a support person with you.

Counsellors and mental health advisors have supervision with another professional as a requirement of their practice. Supervisors provide feedback on the counsellor or mental health advisor's work and support their professional development. They are helping you in stuff like anxiety, stress and concerns about personal safety.

All you have to do is to call AUT counselling service – 09 921 9292 or email – { HYPERLINK "mailto:counselling@aut.ac.nz" }, telling my student's ID, name, and requesting an appointment. You can also choose a male or female counsellor while you are requesting for counselling service. I'm letting you know my student's ID if you need in the process of interviewing.

The following are some of the counsellors of AUT, to name but a few.

- 1- Tajana Karaman _ Manager Student Counselling and Mental Health (PGDip CBT, Grad Dip Psychotherapy, BHSc ApMH, MNZAC)
- 2- Jess Stevens _ Senior Mental Health Advisor, City Campus (BA Psych, PGDip (Couns.), MNZAC)
- 3- Amanda Lees _ Counsellor, North Campus (MA (Hons), Med (Couns) (Hons), MNZAC)

What are the benefits?

It is anticipated that your answers and comments will provide important insights to realize the familiarity of Myanmar migrant community to the disaster risk profile of Auckland, New Zealand and to have better risk communication for migrant community. The research findings will also be shared nationally and internationally by producing journal articles and presentations. A \$20.00 NZD shopping voucher or gift voucher card will be offered in recognition of the participants time.

How will my privacy be protected?

If you agree to participate in this research, all the information you provide during the interview will be held in confidence. You will be informed prior to commencing the interviews that the information you provide including your answers will be kept in total confidentiality. Your name and any personal identifiable information will not appear in any publication or report of the research as all your inputs will be coded and safely stored with the use of password protection and this information will be accessed only by the researcher. Following the completion of the study, all the electronic records and hard copies of your information will be securely stored and archived for six years at AUT. After six-year retention period, all related information will be permanently deleted from research computers and any hard copies will be destroyed as well. We will fully ensure the confidentiality to the most possible extent.

What are the costs of participating in this research?

There will be no cost for you to participate in this study. We kindly invite you to participate in an interview which will be conducted via Skype or Microsoft Team video calls and will take 30-45 minutes of your time.

What opportunity do I have to consider this invitation?

I kindly ask you to consider my invitation to participate in this study and provide a response within two weeks please to the researcher, Su Myat Kyaw, { [HYPERLINK "mailto:qdf8124@autuni.ac.nz"](mailto:qdf8124@autuni.ac.nz) }, 022 588 3418.

Will I receive feedback on the results of this research?

After completion of this research project, you will be sent a summary report of the findings if you indicate in the Consent form that you would like to have a copy.

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

Any concerns regarding the nature of this project should be notified in the first instance to the Researcher, Su Myat Kyaw, { [HYPERLINK "mailto:qdf8124@autuni.ac.nz"](mailto:qdf8124@autuni.ac.nz) }, 022 588 3418

Any concerns regarding the nature of this project should be notified in the first instance to the supervisor of the researcher, Dr Ailsa Holloway, Faculty of Health and Environmental Sciences, { [HYPERLINK "mailto:ailsa.holloway@aut.ac.nz"](mailto:ailsa.holloway@aut.ac.nz) }, (09) 9219999 Ext 6796

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTECH, Dr Carina Meares, { [HYPERLINK "mailto:ethics@aut.ac.nz"](mailto:ethics@aut.ac.nz) }, 09 921 9999 Ext 6038

Whom do I contact for further information about this research?

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

Researcher Contact Details:

Su Myat Kyaw, { [HYPERLINK "mailto:qdf8124@autuni.ac.nz"](mailto:qdf8124@autuni.ac.nz) }, +64 22 588 3418

Project Supervisor Contact Details:

Dr Ailsa Holloway, { [HYPERLINK "mailto:ailsa.holloway@aut.ac.nz"](mailto:ailsa.holloway@aut.ac.nz) }, (09) 921999 Ext 6796

Approved by the Auckland University of Technology Ethics Committee on *type the date final ethics approval was granted*, AUTECH
Reference number *type the reference number*.

Appendix D: Consent Form



Consent Form

Project title: *A qualitative descriptive study in Auckland, New Zealand: Understanding flood and storm risk communication, perceptions and interpretations of Myanmar migrants*

Project Supervisor: **Dr Ailsa Holloway**

Researcher: **Su Myat Kyaw**

- ☐ I have read and understood the information provided about this research project in the Information Sheet dated April 2020.
- ☐ I have had an opportunity to ask questions and to have them answered.
- ☐ I understand that the interview will be conducted by Skype or Microsoft Teams and that the interview will be audio-recorded and then transcribed.
- ☐ I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without being disadvantaged in any way.
- ☐ I understand that if I withdraw from the study then I will be offered the choice between having any data that is identifiable as belonging to me removed or allowing it to continue to be used. However, once the findings have been produced, removal of my data may not be possible.
- ☐ I agree to take part in this research.
- ☐ I wish to receive a summary of the research findings (please tick one): Yes ☐ No ☐

Participant's signature :

Participant's Name :

Participant's Contact Details (if appropriate) :

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

Date :

Approved by the Auckland University of Technology Ethics Committee on type the date on which the final approval was granted AUTEC Reference number type the AUTEC reference number

Note: The Participant should retain a copy of this form.

Appendix E: Introductory and Interview Questions

Auckland University of Technology
Private Bag 92006, Auckland 1142, NZ
T: +64 9 521 9999
www.aut.ac.nz



Introductory questions

For use by research member only

Study Participant Number: _____

Date: _____

1) Age at last birthday: (circle one please)

- a. 25-35 years
- b. 35-40 years
- c. 40-45 years
- d. 45-50 years
- e. 50-55 years

2) Sex: (circle one please)

- a. Female
- b. Male
- c. Other (please state): _____

3) Which part of Myanmar you used to stay?

Ans: _____

4) What language(s) do you currently speak and understand:

- a. Burmese
- b. English
- c. Thai
- d. Others (please state): _____

5) Are you comfortable using English as a medium?

- a. Yes
- b. No

6) How long have you been staying in New Zealand?

Ans: _____

7) Which part of Auckland are you staying?

Interview questions

Question -1: Previous experience before arriving New Zealand

Which countries have you stayed before you arrived here in Auckland, New Zealand?

Have you ever affected by a bad storm or flood in those previous countries? _ Yes or No!

If 'yes', please share with me about it!

After experiencing this, is there any changes in your perception?

If 'no', what about hearsay from the others who had affected?

After hearing about that, what changes occurred in your mind?

Question -2: Previous experience in Auckland

In your time in Auckland, have you ever experienced a bad storm or flood until now? _ Yes or No!

If yes, how did you find out about it and manage it?

Did this storm or flooding change how you think about your safety during storm or flood in Auckland?

If no, in Myanmar community, have you heard anything from other people who had experienced? And are there any perception changes in your mind after hearing from other people?

Question -3: Getting Information

Question -3.1: Unofficial information

How could you know if Auckland is going to have a bad storm apart from government news?

How would you know if your area is going to be affected by flooding excluding government news?

Do you get a message from your friends? What kind of friends? From work, Myanmar community, your neighbours, or old friends?

Do you get information from your 'family'/ someone or somewhere else?

Do you check weather app on your phone?

Question -3.2: Official information and Early Warning

Do you watch the weather forecast on TV? Or do you listen it on Radio?

Any specific channel which you think it is reliable?

Where do you get your early warning to prepare for a flood or storm?

Question -3.3: Language Unproficiency

Do you think how difficulty in understanding official language for yourself and/or others in community?

How do you think severity of language barrier in Myanmar community?

What language(s) do you currently speak and understand? Are you comfortable using English as a medium?

Question – 4: Emergency Alarm in your mind

Do you think when you need to face that kind of disaster or be alert?

Question -5: Preparedness Plan

Do you stay alone or with your family or flatmates?

Do you have any specific plans for your household family members in case of flood or storms?

If no, why?

If yes, where would you go and what would you do?

Question -6: Communication during and after

Who would you ask/connect for reliable information during and after flood or storm?

How would you seek this information?

How can you get the information if there was no internet connection?

Question -7: Requirements and Benefits of having an organization in Myanmar community

Do you think there are requirements in Myanmar community, particularly Myanmar Gonye organization, for flood and storm risk communication? What are they?

Are there any benefits of having Myanmar Gonye organization in Myanmar migrant community?

Question -8: Suggestions or Recommendations for Myanmar community

Do you have any recommendations for Myanmar migrant community in improving better storm and flood communication in Auckland?

Any suggestion for community to be better?

Appendix F: Support letter from Myanmar Gonye organization



MYANMAR GON YE ORGANIZATION

myanmargonyenz@gmail.com

17th Feb 2020

To whom it may concern,

I am writing this letter in support of Su Myat Kyaw who is undertaking the MSc Emergency Management at AUT. Myanmar Gon Ye organization of Myanmar community Auckland, New Zealand is supportive of the research project proposed by Su and will facilitate access to adult migrants for her interviewing process of the study.

We will ensure that all data collected as part of Su's study will be de-identified to protect the identified to protect the identities of participants. We note that ethics approval process is a requirement for the research project.

Yours faithfully,

Mr. Linn Linn Htay

President of Myanmar Gon Ye organization

Myanmar Community

Auckland, New Zealand



Appendix G: Confidential agreement with a neutral bilingual researcher

Confidentiality Agreement

For an interpreter.

Project title: *A Qualitative Descriptive Study: Understanding Flood and Storm risk communication, perceptions and interpretations of Myanmar migrants in the context of New Zealand, Auckland*

Project Supervisor: **Dr Ailsa Holloway**

Researcher: **Su Myat Kyaw**



I understand that the interviews meetings or material I will be asked to translate is confidential.



I understand that the content of the interviews meetings or material can only be discussed with the researchers.



I will not keep any copies of the translations nor allow third parties access to them.

Translator's signature:

Translator's name:Dr Thet Nway Ei

Translator's Contact Details (if appropriate):

..... Medical Coordinator

..... Indonesian International School

..... 100, Lower Kyimyindine Road, Alone Township

..... Yangon, Myanmar

..... Email: missthatnwaye@gmail.com

..... Phone: (+95) 9972531676

Date: 25.February.2020

Appendix H: Ethics approval from AUTECH



Auckland University of Technology Ethics Committee (AUTECH)

Auckland University of Technology
D-88, Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999 ext. 8316
E: ethics@aut.ac.nz
www.aut.ac.nz/researchethics

20 April 2020

Ailsa Holloway
Faculty of Health and Environmental Sciences

Dear Ailsa

Re: Ethics Application: **20/15 A qualitative descriptive study in Auckland, New Zealand: Understanding flood and storm risk communication, perceptions and interpretations of Myanmar migrants**

Thank you for your responses to the conditions for the amendment to your ethics application.

The amendment to the data collection protocols individual interviews conducted by via Skype or Microsoft Team video calls is approved.

I remind you of the **Standard Conditions of Approval**.

1. The research is to be undertaken in accordance with the [Auckland University of Technology Code of Conduct for Research](#) and as approved by AUTECH in this application.
2. A progress report is due annually on the anniversary of the approval date, using the EA2 form.
3. A final report is due at the expiration of the approval period, or, upon completion of project, using the EA3 form.
4. Any amendments to the project must be approved by AUTECH prior to being implemented. Amendments can be requested using the EA2 form.
5. Any serious or unexpected adverse events must be reported to AUTECH Secretariat as a matter of priority.
6. Any unforeseen events that might affect continued ethical acceptability of the project should also be reported to the AUTECH Secretariat as a matter of priority.
7. It is your responsibility to ensure that the spelling and grammar of documents being provided to participants or external organisations is of a high standard.

AUTECH grants ethical approval only. You are responsible for obtaining management approval for access for your research from any institution or organisation at which your research is being conducted. When the research is undertaken outside New Zealand, you need to meet all ethical, legal, and locality obligations or requirements for those jurisdictions.

Please quote the application number and title on all future correspondence related to this project.

For any enquiries please contact ethics@aut.ac.nz. The forms mentioned above are available online through <http://www.aut.ac.nz/research/researchethics>

(This is a computer-generated letter for which no signature is required)

The AUTECH Secretariat

Auckland University of Technology Ethics Committee

Cc: qdf8124@aut.ac.nz

Appendix I: PGR1 approval



Auckland University of Technology
Private Bag 92006, Auckland 1142, NZ
T: +64 9 921 9999
www.aut.ac.nz

29 November 2019

Su Myat Kyaw
Unit 141, 26 Te Taou Crescent
Auckland CBD 1010

Dear Su Myat

Thank you for submitting your PGR1 Research Proposal application for the Master of Emergency Management.

Your proposal has been reviewed and approved by the Faculty of Health and Environmental Sciences, which will be noted at the Postgraduate Research Committee February 2020 meeting.

Your enrolment details are:

| | |
|---------------------------|---|
| Current programme: | Master of Emergency Management |
| Enrolment: | Dissertation (60pt) - Full-time |
| Student ID | 18031064 |
| Topic: | A qualitative descriptive study in Auckland, New Zealand: Understanding flood and storm risk communication, perceptions and interpretations of Myanmar migrants |
| Primary supervisor: | Dr Ailsa Holloway |
| Start date: | 27 January 2020 |
| Expected completion date: | 17 July 2020 |

For more information about the programme of study, please refer to the *Postgraduate Handbook*.

The AUT website for forms and handbooks is:

<https://autuni.sharepoint.com/sites/sdw/research/prores/Pages/default.aspx>

Yours sincerely

Assoc Prof Nigel Harris
Associate Dean (Postgraduate Research)
Postgraduate and Research Office
Faculty of Health and Environmental Sciences

Cc Primary supervisor Dr Ailsa Holloway

Appendix J: Researcher's codebook

Researcher's Codebook

Nodes

1 = Main themes, Bold 1.A = Sub-themes, Bold 1.A.1 = Parent Codes 1.A.1.1 = Child Codes

Under main theme 3 preparedness - most of Parent nodes do not have child nodes

| Name | Description | Files | References |
|--|--|-------|------------|
| Main theme 1: Flood and storm risk Perceptions and interpretations for action | Risk interpretations and understanding based on previous experiences and familiarity of risk profile in current place | 0 | 0 |
| 1-C) Access to information During and Post-disaster | How participant will seek information during and after a disaster | 7 | 9 |
| 1-B) Pre-disaster Communication (event-specific) | How participants seek information, communicate, and facing problems before an event in Auckland | 0 | 0 |
| 1.B.1-Access to Official Information and Early warning | | 0 | 0 |
| 1.B.1.1 -Gap in Communication | | 4 | 6 |
| 1.B.1.2-Official Information/Early warning | Accessing and sharing of official information and Early warning | 8 | 13 |
| 1.B.1.3 -Reliable Information | Care about reliable information for both seeking and sharing | 5 | 10 |
| 1.B.2-Language | | 0 | 0 |
| 1.B.2.1-Expectation of Translation Service | Land line phone service and Service for translating English to Burmese | 2 | 3 |
| 1.B.2.2-Language Difficulty for minority Ethnic | Unable to understand Burmese language properly for those who are minority ethnic group of Myanmar migrant community | 2 | 3 |
| 1.B.2.3-Language Difficulty in English | Limited use of English language in communication | 8 | 14 |
| 1.B.3-Problem with Technological access | Ability to use technology for the purpose of seeking information related to flood and storm | 1 | 2 |
| 1.B.4-Unofficial or Informal information sources | | 8 | 12 |
| 1-A) Pre-disaster Knowledge | Participants' knowledge related to flood and storm risk before and after arriving NZ | 0 | 0 |
| 1.A.1-Learned or Acquired Knowledge after arriving NZ | | 0 | 0 |

| Name | Description | Files | References |
|--|--|-------|------------|
| 1.A.1.1-Exposure to environmental awareness raising | Aware of environmental conservation | 2 | 3 |
| 1.A.1.2-Exposure to News and other warnings | | 8 | 9 |
| 1.A.1.3-Hearsay | Hearing from others about flood and storm related experience | 4 | 9 |
| 1.A.1.4-Lived experience in Auckland | Previous experience related to flood and storm in Auckland | 5 | 6 |
| 1.A.1.5-No sense of threat (Fearlessness and Carefree or Overconfidence) | | 3 | 7 |
| 1.A.2-Learned or Acquired Knowledge before arriving NZ | How participants perceived risk before they arrived NZ | 0 | 0 |
| 1.A.2.1-Feeling Empathy | Feeling sad and kind to the disaster victims | 4 | 5 |
| 1.A.2.2-Lack of Effective pre-disaster information | Lack of disseminating effective information for the community before flood and storm in previous places | 6 | 9 |
| 1.A.2.3-Past experience in Home country | Past experience of flood and storm while participant were staying in Myanmar | 4 | 4 |
| 1.A.2.4-Previous experience as a catalyst | Participants who had traumatic experience tend to have more risk awareness | 2 | 6 |
| 1.A.2.5-Previous Transboundary Situation | Traumatic condition related to flood and storm at refugee camps | 4 | 11 |
| Main theme 3: Preparedness | Any idea, actions, gaps for preparation of coming flood and storm related emergency situations and different early warning responses in current place | 0 | 0 |
| 3.A-Early Warning Response | Different ways of participants' response to Early Warning messages | 0 | 0 |
| 3.A.1-Indigenous Knowledge | Knowledge taught by elders for weather forecast apart from Technological and Scientific investigation | 1 | 1 |
| 3.A.2-Text messaging | | 2 | 2 |
| 3.A.3-Volunteerism | | 2 | 6 |
| 3.A.4-Weather App | | 7 | 7 |
| 3.B-Preparedness Action (Household level) | Actual action of participant in facing an event related flood and storm | 0 | 0 |
| 3.B.1-Emergency Kit | Preparation of First Aid kit in case of emergency | 2 | 2 |

| Name | Description | Files | References |
|---|--|-------|------------|
| 3.B.2-Food storage action | | 2 | 2 |
| 3.B.3-Prepared something | | 4 | 4 |
| 3.C- Preparedness Gaps | Preparedness Gaps of community in preparation of Auckland flood/storm risk | 0 | 0 |
| 3.C.1-Financial resources | Finance related recommendation of participants | 0 | 0 |
| 3.C.1.1-Financial Aids and Manpower | Setting up financial provision and manpower in rehabilitation phase of a disaster | 4 | 4 |
| 3.C.1.2-Financial Support | Funding for preparation/rehabilitation process of flood/storm related emergency | 3 | 3 |
| 3.C.2-Information cannot be shared to senior members | | 1 | 1 |
| 3.C.3-Preparedness programs | Programs for migrants regarding English language and knowledge providing for risk information | 0 | 0 |
| 3.C.3.1-English Language program | Long-term English language classes for migrants for free of charge | 1 | 1 |
| 3.C.3.2-Preparedness program and More training | Authorities planned a disaster preparedness training program for migrant community in 2019 and a community member wants more | 1 | 5 |
| 3.D.3-Weak connection or linkage | Connection between NZ government and organization in Myanmar migrant community is not too strong | 3 | 9 |
| 3.D-Preparedness Thinking (Household level) | Thoughts of participants on how they would prepare in case of flood and storm | 0 | 0 |
| 3.D.1-Food storage | | 3 | 3 |
| 3.D.2-No thorough preparedness plan | No plan for preparation in case of emergency | 5 | 10 |
| 3.D.3-Ready to follow | Not sure what to do but ready to follow other people's if it's good | 3 | 3 |
| 3.D.4-We will follow authorities' instructions | | 3 | 3 |
| Main theme 2: Socio-cultural practices and perspective | Beliefs, Norms and Values of community in flood and storm preparedness from socio-cultural perspective | 0 | 0 |
| 2.A-Beliefs | Cultural beliefs of participants in understanding disaster risks | 0 | 0 |
| 2.A.1-New Zealand | | 0 | 0 |

| Name | Description | Files | References |
|---|--|-------|------------|
| 2.A.1.1-New Zealand as a good example | Emergency management plan of New Zealand is regarded as a good example among participants | 4 | 9 |
| 2.A.1.2-New Zealand as a safer place | | 2 | 2 |
| 2.A.1.3-Sense of safety here! | | 4 | 5 |
| 2.A.2-Sense of fatalism | Believing everything depends on fate | 1 | 4 |
| 2.B-Norms | Cultural norms of community in understanding disaster risks | 0 | 0 |
| 2.B.1-Deferential or polite or shy behaviour | | 1 | 2 |
| 2.B.2-Language Barriers | Recommendation related to language unproficiency | 0 | 0 |
| 2.B.2.1-Directly proportionate between English and Employment | When the migrants are unemployed, their English language proficiency is low | 1 | 4 |
| 2.B.2.2-English Language Improvement | | 2 | 2 |
| 2.C-Values of community | Values of community or "Community culture" to prepare themselves by improving risk communication | 0 | 0 |
| 2.C.1-Association's duties | Responsibilities of EC members in Myanmar Gonve organization | 1 | 1 |
| 2.C.1.1-Executive Committee members' duties | Executive committee members of Myanmar Gonve organization are responsible for delivering reliable information & connection with government | 2 | 4 |
| 2.C.1.2-Information dissemination | | 3 | 5 |
| 2.C.2-More Help and Kind | | 0 | 0 |
| 2.C.2.1-More familiarity & Help | Participants feel migrants are more familiar each other and help after establishing association Thinking about helping each other after own or hearsay experiences | 6 | 8 |
| 2.C.2.2-More help, build and training | more help and kind each other in the community and build a stronger organization Also, need more training related to emergency management | 2 | 3 |
| 2.C.3-Mutual trust and assistance (Practical and Emotional) | | 0 | 0 |
| 2.C.3.1-Spiritual support | Feeling emotional support by community members | 4 | 4 |

| Name | Description | Files | References |
|---------------|---|-------|------------|
| 2.C.3.2-Trust | Trust between members of community and organization | 6 | 6 |