

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**Mobilizing citizens for reducing disaster risks: A study
of communication practices aimed at encouraging
civic participation and collective action in disaster
preparedness in Aotearoa New Zealand**

A thesis presented in partial fulfilment of the requirements for the
degree of Doctor of Philosophy in Emergency Management at
Massey University, Wellington, New Zealand

Manomita Das

2024

Note for Examiners of Doctoral Theses
Explanation of Impacts on Research

Thank you for taking the time to examine this thesis, which has been impacted by the pandemic, extreme weather-related events, such as Cyclone Gabrielle, and/or changes in the university, including relocation, staffing and resources.

This information has been provided to allow you as an examiner, to take into account how certain factors such as delays and disruptions experienced by the PhD student will have impacted their research outcomes. This form has been completed by the supervisor and student, and outlines the extent that the student’s research has been affected.

Please consider the factors listed below in your assessment of the work.

This statement has been prepared by the candidate’s supervisor in consultation with the student and has been endorsed by the relevant Head of Academic Unit.

Student Name:	Manomita Das	ID Number:	██████████
Supervisor Name:	Julia Becker, Emma Hudson-Doyle, Sara McBride	Date:	17-Dec-2024
<p>Thesis title: Mobilizing citizens for reducing disaster risks: A study of communication practices aimed at encouraging civic participation and collective action in disaster preparedness in Aotearoa New Zealand</p>			

Considerations to be taken into account. Note: This statement will remain in the final copy of the thesis which will be available from the Massey University Library following the examination process.

[Enter key considerations here for the examiners. This can include but is not limited to change of scope, scale, topic, focus; limitations in relation to data collection, access to necessary literature or archival materials, laboratories, field sites; disruptions as a result of lockdown and various alert levels, medical or health considerations etc]

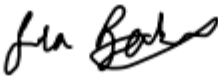

1. Initial interactions with communities had to be conducted online due to public health considerations. This significantly slowed the relationship-building process, which is typically more effective in person. As a result, participant recruitment, the quality of information gathered, and the overall pace of the research were impacted.
2. Limitations to in-person engagement particularly affected the relationship-building process with hard-to-reach communities, who were initially expected to be a key group of participants in the study. This impacted the scope of the study.
3. It was difficult to recruit critical participants, such as emergency management officials and community leaders, as they were occupied with COVID-19-related responsibilities during the initial stages of the research.
4. During the early months of the study, public meetings, events, and other social activities were not being held. These events were initially intended as key data collection opportunities, and their absence reduced the quantity of data that could be gathered.
5. Field visits were postponed till late 2022 due to public health concerns, delaying the data collection and analysis processes.

Note: The student started the course for the first three months (June 2021-Sep 2021) overseas during the COVID pandemic. She availed suspension of 2 months (Oct 2021 - Nov 2021) for travel and managed isolation procedures (i.e., isolation in a hotel on arrival) before resuming studies in Wellington.

Approved by DRC February 2021
Updated November 2023

Confidential for Examiners Only: *[Please enter any other considerations which are confidential for examiners only and should not be placed in the final thesis version submitted to Library following the examination process]*

Signed, confirming this is a fair reflection of the impact of the pandemic, extreme weather events and/or university change processes on this research.

Student	Supervisor	Head of Academic Unit (or nominee)
<p>Manomita Das</p> <p><small>Digitally signed by Manomita Das DN: cn=Manomita Das, email=mdas@uwaterloo.ca Reason: I am the accuracy and integrity of this document Location: Wellington Date: 2024.11.18 22:02:03 +0930 Full PDF Reader Version 12.1.2</small></p>		

Approved by DRC February 2021
Updated November 2023

Abstract

Community-based disaster risk reduction (DRR) approaches provide an effective means of reducing the impacts of extreme events caused by natural hazards. Such approaches involve engaging with 'at-risk' communities in the pre-disaster stage and supporting them to reduce their risks through preparedness actions. These preparedness actions operate both at an individual level such as having emergency kits and personal preparedness items and at a community level such as developing community response plans and establishing community response groups through collective community actions.

While individual preparedness actions are well-documented in New Zealand (NZ), there is limited research examining collective actions in DRR and their facilitators. This is a critical gap as many disaster risks cannot be substantially reduced by individual efforts alone and require collective community wide efforts. Moreover, central to involving community in DRR is communication. While a strong knowledge base on communication for individual preparedness actions exist, there is a lack of clarity on how communication can promote people's participation and collective actions in DRR. This research, therefore, aims to achieve two key objectives: first, to understand collective actions in DRR in NZ, exploring their forms, enablers, barriers, and outcomes; and second, to examine how communication can be leveraged to support and enhance these collective actions.

An exploratory sequential mixed methods approach was adopted. For qualitative data, a multi-case study was conducted. The findings were derived through thematic and cross-case analysis of 35 interviews with emergency management officials and community members, observation notes of community events and field visits and review of communication materials and documents. Quantitative data included 80 survey responses from volunteers and community members participating in collective actions for DRR.

The findings provide important insights on collective community actions in DRR and the role of communication in supporting them. Firstly, the study outlines three forms of people's participation in DRR: volunteering with New Zealand Response Teams, participation in local community emergency response teams, and involvement through existing community groups like resident associations or sports clubs. Key factors triggering participation include heightened hazard awareness and initiation by emergency management agencies. Trusted local facilitators, community dialogue, and institutional support sustain collective actions, while challenges like low community interest and bureaucratic barriers hinder them. The findings highlight that civic participation in DRR in New Zealand is response-centric and lacks a proactive approach towards preventing risk creation and mitigating local hazards.

Secondly, using a communication ecology perspective and drawing on the Communication Infrastructure Theory, the research explores the communication processes, actors, and resources that foster or hinder collective participation in DRR. The data reveals that civil defence emergency management agencies, different government organizations, non-governmental and community-based agencies, and local people serve as key communicating actors. Community centres, schools, and public libraries are critical resources within the community communication network serving as hubs for community involvement where residents participate in emergency management activities, engage in dialogue, and collaborate to address disaster risks. Relationship building activities, awareness events, advertisements and community conversations play an important role in the communication

process. Contextual factors such as safety and accessibility of the social infrastructure, presence of skilled facilitators, existing community organizations with networks and relationships and supporting institutional and resourcing mechanisms also influence civic participation and collective action in DRR.

Thirdly, the research finds that communication approaches to promote civic participation in DRR heavily rely on two-way conversations between emergency managers, community members and other stakeholders. These conversations flow through narratives conveying disaster risks and preparedness messages, rather than factual argumentation. Four key themes were identified in the narratives - connection and care (encouraging people to care for their communities and build support networks), everyday heroes (highlighting the value of simple actions in emergencies), collective efficacy (emphasizing the ability of community members to work together toward DRR goals), and collective responsibility (underscoring the shared duty to address local risks). While the narratives are generally helpful in promoting community agency and fostering social capital, some narratives, particularly the collective responsibility narrative, was found to be problematic which creates confusion and frustration.

Lastly, the findings highlight the growing role of social media in supporting collective DRR actions at the community level. They demonstrate how social media helps in maintaining conversations on preparedness in regular discourse and serves as a communication platform for communities of practice in preparedness. Neighbourhood based social media pages are valuable to promote civic participation in DRR and are most widely used compared to other Web 2.0 based applications.

The thesis makes an important contribution to the academic and practical understanding of collective actions in DRR and the role of communication in facilitating them. It provides an overview of forms and facilitators of collective actions in NZ, addressing a gap in existing literature. Additionally, the findings advance communication research on disaster and community resilience by adopting the relational network perspective which is an emerging area of research. The findings offer an evidence base for policy and programme development, particularly for advancing NZ's National Disaster Resilience Strategy (2019). By advancing the existing knowledge base, this thesis is expected to support meaningful civic participation and collective action, empowering communities to reduce disaster risks and improve their resilience.

Preface

“Never doubt that a small group of thoughtful, committed citizens can change the world: indeed, it’s the only thing that ever has.” – Margaret Mead

In February 2014 I went on a visit to Sundarbans, in east India. It is an active delta in the Bay of Bengal which witnesses tidal action. The inhabited islands are secured with earthen embankments, many of which prevent the tidal water from entering the villages. At around 11 pm, our friend, who is a local took us on a night walk around the village. I remember the starry sky and the ripples on the river. As we were close to the embankment, we found a few local people digging around the embankment. Our friend stopped and asked, “Does it look weak?”. One of the people replied, “Seems so, we will keep a watch, I have already instructed the others”. Our friend nodded and we walked forward. As we left, I figured the 20 odd people were digging soil and reinforcing the embankment, so that it did not give way to the tide. Next morning, we left for Kolkata, we do not know what happened to the embankment, we do not know how many times they have to do this in a year, I just knew that there are people, in many risk prone areas, who work together or have to work proactively to keep their homes and families safe.

The above is one of the many examples that I observed first hand in my experience of working in the disaster risk reduction (DRR) field. Many people are doing fascinating work to improve preparedness in their communities by running area vigils during hazard seasons, implementing hazard prevention measures for their villages, making sure things are in place and mobilizing collectively to raise demands to the government when there are gaps. This is despite the challenges of volunteering – difficulties to engage new people and maintain enthusiasm in the initiatives, the frustration when things take way too long to move, the issues around bureaucracy, initiatives falling apart because there was not minimal support and the humungous effort it takes to mobilize things again. As hazards get prevented, nothing newsworthy happens, the magnanimity of these efforts go unrecognized as they are not tangible and measurable.

Moreover, emergency management practitioners are increasingly highlighting the value of community led response and “spontaneous volunteering” in post disaster situations. DRR projects and initiatives are also being increasingly structured keeping “spontaneous” volunteering in mind. However, what remains less recognized is that the conducive conditions for mobilizing post disaster community efforts do not emerge from a vacuum - it is built on the connections, relationships, and the social environment that is nurtured by local people through their everyday activities and interactions, where sense of community is fostered, community values and ideals are imparted, local voices are raised, and governance mechanisms are held accountable and responsible. Such an environment that nurtures social capital and bottom-up civic engagement is central for post event volunteering to function smoothly. After disasters, when bigger organizations march in and take over, the ensuing media narratives focus on the disaster as a totalizing event, severing its connection to the societal conditions preceding the disaster. Even when the post-disaster operations run smoothly due to the conducive environment fostered by people through their daily interactions and the pre-existing community spirit, these aspects seldom receive attention in the mainstream narrative.

Through this doctoral study, I wanted to recognize these groups and the community dynamics that enable people to collectively prepare for hazards and improve their collective capacity to respond to hazards. I wanted to understand these people, groups and communities, their interactions, local dynamics, and the contested community terrain, that support pre-disaster preparedness in the communities and create an environment that improves functioning of post disaster efforts – what is happening, why people do this, what helps in the process and what needs to change. I hope that this research will bring more visibility to the amazing and sometimes exhausting work that some people and community groups are doing, and make sure they are not overlooked, their needs and aspirations are not deprioritized, and that proper supporting mechanisms are in place when we plan for building “resilience” in our communities.

Acknowledgements

My PhD journey is not mine alone - it belongs as much to everyone who supported me along the way.

First and foremost, I am deeply indebted to my research participants, who generously shared their time and trusted me with their knowledge and experiences. I am grateful to the government officials who, despite their demanding schedules, patiently answered my questions as I navigated my research as a beginner. I am also profoundly thankful to the community members who welcomed me in their communities, shared their stories, and made me feel at home. These conversations not only laid the foundation of my research but also inspired me to continue this work.

To my incredible supervisory team: thank you for your trust and unwavering support throughout this journey. Your vision, guidance, and support have been instrumental in shaping the research in its current form. Thanks for providing me with incredible opportunities and looking out for me. Julia, your encouragement to explore independently has been invaluable. I have learned so much from you, most importantly how to stay calm and persevere, even when things didn't go as planned. Emma, I deeply appreciate of your thoughtful feedback and your ability to spark refreshing discussions that kept my research engaging. Sara, your practical advice made my life so much easier. Most importantly, thank you all for your kindness, empathy, and patience with me - it has not been an easy journey, and I owe you immensely for the emotional support that helped me navigate this.

I am grateful to the Resilience to Nature's Challenges programme for funding my research and providing consistent support throughout my PhD. A sincere thanks to the Graduate Research School (GRS) team for creating a nurturing environment for the students. To the "Shut Up and Write" group, thank you for keeping me motivated on the toughest days. And to the health and counselling services at Massey, particularly Mark Pope, for keeping me happy and healthy.

I also wish to acknowledge my colleagues at the Joint Centre for Disaster Research for creating a collaborative and stimulating environment that nurtured both my academic and personal growth. Additionally, I am thankful to my Red Cross colleagues for creating many opportunities to give back to the society.

My sincere appreciation goes to Prof. Janki Andharia, who first ignited my passion for research, and greatly contributed to who I am today; and to G.K. Bhat, whose mentorship gave me the confidence to pursue my dreams.

I am incredibly fortunate to have amazing friends in both Wellington and India. Priya, thank you for being there – from the impromptu drives and silly movies to our banter on geopolitics and pigeons. Thanks for being a partner in doing the most ridiculous things, for disrupting my schedule (“despite you!”) and for filling my life with colour and joy. Sree, you have been such an inspiration! I greatly admire your work ethics and focus. You motivate me to stay grounded, let go of self-doubt and give my best without fear of failure. I would not have finished this without our study sessions together. Tria and Yuriko, I deeply appreciate your support when I was adjusting to life in a new country. And, definitely, a huge thanks to my support network back home - Annwasha, Sreemoyee and Koli for being my pillars from childhood, Negi, Praveen and Larina for having my back and Kp, Jeet and Anyatama for the random things we do (and the memes) that keeps me going! I'm grateful to have you all by my

side! Also, a massive thanks to my in-laws for their unwavering support throughout this journey - I miss our dinners together watching dance shows.

To my husband, Parijat, words cannot fully express my gratitude. Your patience, understanding, and support have been invaluable. Thank you for your calming presence, for motivating me to keep going, for asking me to take a break when I was on the verge of a break down, listening to my presentations, giving inputs to my papers, for prioritizing my academic pursuits, which at times paused our life together, the list goes on. Your belief in me has been a cornerstone of my progress and I am deeply grateful for having you in my life!

To my parents, thank you for everything! You encouraged me to pursue higher education, made sure I was supported, and never let anything get in the way of my studies. Your faith in me, guidance and love have been my pillars of success. I am in awe of all you two have achieved, and I wish I can achieve the same in my lifetime.

Last, but not the least, I am grateful for this opportunity and recognize my privileges and blessings. My heartfelt thanks go to everyone who has touched my life and contributed, directly or indirectly, to this journey.

Table of contents

Abstract	iv
Preface	vi
Acknowledgements	viii
Table of contents	x
List of tables	xv
List of figures	xvi
Chapter 1 Introduction	1
1.1 Existing knowledge and research needs	2
1.1.1 Civic participation and collective action in disaster risk reduction	2
1.1.2 Communication, collective action, and civic participation	2
1.2 Objectives of the research	3
1.3 Research Scope	4
1.4 Thesis outline	5
1.5 Chapter summary	7
Chapter 2 Literature review	9
2.1 Introduction	9
2.2 Civic participation and collective action in disaster risk reduction	9
2.2.1 Defining key terms - Disaster risk reduction, civic participation and collective action	9
2.2.2 Participation and disaster risk reduction	11
2.3 Communication and civic participation in disaster risk reduction	19
2.3.1 Communication and participation	19
2.3.2 Four traditions in disaster and risk communication literature	23
2.3.3 Communication landscape in New Zealand	30
2.4 Theoretical perspectives guiding the study	36
2.5 Chapter summary	38
Chapter 3 Research Design	40
3.1 Introduction	40
3.2 Research paradigm	40
3.2.1 Realist and relativist ontology	40

3.2.2	Epistemology and research paradigm.....	41
3.2.3	Axiological considerations.....	40
3.3	Research Methodology.....	40
3.3.1	Exploratory sequential mixed methods design.....	40
3.3.2	Qualitative case study.....	42
3.3.3	Quantitative survey design.....	63
3.3.4	Integrating the data sets and drawing inferences.....	65
3.3.5	Quality and rigour in mixed methods research design.....	66
3.3.6	Summarizing research methodology.....	69
3.3.7	Ethical considerations.....	71
3.3.8	Researcher Positionality.....	71
3.4	Chapter Summary.....	71
Chapter 4 Civic participation and collective actions for reducing disaster risks at the community level: Insights from Aotearoa New Zealand case studies.....		
4.1	Introduction.....	75
4.2	Literature Review.....	76
4.2.1	Conceptualizing collective action and defining key terms.....	76
4.2.2	Forms of civic participation and collective action.....	77
4.2.3	Factors fostering civic participation and collective actions.....	78
4.2.4	Activities and outcomes of civic participation and collective action.....	79
4.3	Methods.....	81
4.4	Study Groups.....	84
4.4.1	Edgecumbe Community Emergency and Response Team.....	84
4.4.2	Residents' group in Mount Cook, Wellington.....	85
4.4.3	Arthur's Pass Community Response Team.....	86
4.4.4	Gore Community Response Group.....	87
4.5	Findings.....	88
4.5.1	Nature and form of civic participation and collective action in DRR.....	88
4.5.2	Facilitators of civic participation and collective action in DRR.....	90
4.5.3	Activities and Outcomes.....	93
4.6	Discussion.....	96
4.7	Conclusion.....	99

Chapter 5	Exploring communication practices that promote community participation and collective action for reducing disaster risks in New Zealand	102
5.1	Introduction	102
5.2	Literature review	104
5.2.1	Collective action and civic participation in disaster preparedness:	104
5.2.2	Communication and collective action	104
5.3	Methodology	107
5.3.1	Qualitative themes	108
5.3.2	Survey results	109
5.4	Understanding the communication practices	111
5.4.1	Community communication network (NSN)	111
5.4.2	Resources and community contexts (CAC)	116
5.4.3	Integrating new members	118
5.5	Discussion	119
5.6	Conclusion	121
Chapter 6	Examining the narratives shared to encourage civic participation and collective action in disaster preparedness	124
6.1	Introduction	125
6.2	Literature Review	126
6.2.1	Narratives and civic participation	126
6.2.2	Communication, civic participation and collective action for reducing disaster risks	128
6.2.3	Narratives on disasters and their limitations	129
6.3	Methods	132
6.4	Results	135
6.4.1	Preparedness narratives to encourage collective action	136
6.4.2	Navigating tensions and conflicts arising from re-framed narratives	141
6.5	Discussion	142
6.6	Conclusion	145
Chapter 7	Exploring social media functions in the pre-disaster stage: Enhancing preparedness, supporting community actions, and addressing key challenges	147
7.1	Introduction	148
7.2	Social media in pre-disaster stage	148

7.2.1	Social media and pre-disaster communication	148
7.2.2	Social media functions in the pre disaster stage.....	149
7.2.3	Challenges of social media.....	151
7.3	Methods	152
7.4	Findings	154
7.4.1	Social media in the pre-disaster stage	154
7.4.2	Functions of social media in the pre-disaster stage.....	155
7.4.3	Challenges and considerations in utilizing social media	158
7.5	Discussion.....	160
7.6	Conclusion	162
Chapter 8	Discussion and conclusion	164
8.1	Research overview	164
8.2	Integrating the findings: Insights, interpretations, implications and future directions ..	166
8.2.1	Civic participation and collective action for disaster risk reduction in New Zealand.....	172
8.2.2	Communication for encouraging civic participation and collective action	177
8.3	Contributions of the study	187
8.4	Limitations of the study	188
8.5	Future research directions	190
8.5.1	Civic participation and collective action for DRR	190
8.5.2	Communication for encouraging civic participation and collective actions in DRR	192
8.6	Conclusion	194
Appendix 1	Glossary and key terms	196
Appendix 2	Human ethics notification	198
Appendix 3	Interview guide.....	199
Appendix 4	Observation Guide.....	201
Appendix 5	Survey questionnaire	203
Appendix 6	Information Sheets	209
Appendix 7	Consent Form for interviews	216
Appendix 8	List of Codes	217
Appendix 9	Statement of contributions	226

Appendix 10	Factors influencing people’s participation in collective disaster preparedness in New Zealand - Preliminary data	230
References		237

List of tables

<i>Table 1.1 – Mapping of research questions, objectives, and chapters</i>	4
<i>Table 1.2 – Chapter guide</i>	6
<i>Table 2.1 - Summary table on areas of people’s participation in the pre-disaster stage</i>	15
<i>Table 3.1 - Summary of research paradigm</i>	39
<i>Table 3.2 – Qualitative research designs, their characteristics, and a brief description of my evaluation of their suitability.</i>	43
<i>Table 3.3 - Participant profiles for each area, number of participants for that profile, and assigned code identifiers.</i>	48
<i>Table 3.4 – Snippet of the theme chart, showing theme label and description of that theme.</i>	57
<i>Table 3.5 – Case summaries of two cases</i>	58
<i>Table 3.6 – Quality criteria for case study research, and the strategies I adopted.</i>	62
<i>Table 3.7 – Demographic profile of survey participants</i>	65
<i>Table 3.8 – Quality criteria adopted in this research</i>	68
<i>Table 3.9 – Summary of research methods</i>	70
<i>Table 4.1 – Participant profiles, and the identify codes used herein.</i>	84
<i>Table 5.1 – Participant profiles, and identity codes used herein.</i>	109
<i>Table 5.2 – Demographic profile of survey participants</i>	110
<i>Table 5.3 – Survey findings on communicating actors</i>	118
<i>Table 5.4 – Survey findings on communicative actions</i>	119
<i>Table 6.1 – Participant profiles and identity codes used herein.</i>	134
<i>Table 7.1 – Participant profiles, and identity codes used herein.</i>	153
<i>Table 7.2 – Social media functions in the pre-disaster stage</i>	158
<i>Table 8.1 – Research questions and key findings</i>	167

List of figures

<i>Figure 2.1 - Diagram showing four traditions in disaster and risk communication literature</i>	30
<i>Figure 3.1 – Diagram of the exploratory sequential mixed methods design followed in this research.</i>	42
<i>Figure 3.2 – Map showing the study locations</i>	45
<i>Figure 3.3 – Photos taken at study locations</i>	46
<i>Figure 3.4 – Community meeting at Mt Cook (left) and field notes (right)</i>	49
<i>Figure 3.5 – Photos showing communication materials and related documents.</i>	50
<i>Figure 3.6 – Snippet showing how the transcript was coded</i>	53
<i>Figure 3.7 – The figure shows a snippet of codes for observation notes and documents</i>	54
<i>Figure 3.8 – Network model of communication practice for collective preparedness in Wellington</i>	55
<i>Figure 3.9 – Initial theme diagram</i>	56
<i>Figure 3.10 – Example theme map</i>	56
<i>Figure 3.11 – Case process comparison of communication systems, resources, and processes</i>	59
<i>Figure 3.12 – Comparison of factors influencing collective preparedness</i>	60
<i>Figure 3.13 - Snippet of the joint display used to develop the survey questionnaire on motivations</i>	64
<i>Figure 3.14 - Joint display for exploratory sequential mixed methods design.</i>	66
<i>Figure 4.1 – Map of four study sites with demographic and hazard profile.</i>	83
<i>Figure 4.2 – Snapshots from Edgecumbe</i>	85
<i>Figure 4.3 – Snapshots from Mt Cook neighbourhood, Wellington.</i>	86
<i>Figure 4.4 – Snapshots from Arthur’s Pass Village</i>	87
<i>Figure 4.5 - Snapshots from Gore.</i>	88
<i>Figure 4.6 – Forms of civic participation in DRR actions at the community level in New Zealand</i>	89
<i>Figure 4.7 – Visualizing the outcomes of collective action in preparedness as an iceberg</i>	96
<i>Figure 5.1 – Map of study areas.</i>	108
<i>Figure 5.2 – Representative diagram of the community communication network</i>	116
<i>Figure 6.1 – Map of study areas (Edgecumbe, Wellington, Arthur’s Pass and Gore in New Zealand)</i>	133
<i>Figure 6.2 – Community emergency response team meeting and training night (in Selwyn)</i>	135
<i>Figure 6.3 - Communication material shared at a meeting (in Selwyn) and found at a café (in Wellington)</i>	135
<i>Figure 7.1 – Map of the study areas in New Zealand.</i>	154
<i>Figure 8.1 – Map of study locations</i>	166
<i>Figure 8.2 – Areas of civic participation for implementing disaster risk reduction actions</i>	173

Figure 8.3 – Graphical overview of civic participation and collective action in DRR, including the influencing factors, its forms and the outcomes. 175

Figure 8.4 – Diagram showing the four traditions in disaster and risk communication research (taken from the literature review chapter). 179

Figure 8.5 – Schematic interpretation comparing current communication practices & existing literature base on disaster and risk communication in New Zealand. 179

Figure 8.6 – Communication supporting civic participation & collective action in DRR: Graphical overview 183

Chapter 1 Introduction

This chapter introduces the thesis to the readers and presents a snapshot of the contents in this document. First it situates the research within the New Zealand policy and practice context. Then it summarizes the existing knowledge on civic participation and disaster and risk communication, delineates the knowledge gap and establishes the research questions. Finally it outlines the scope of the research and provides an overview of the thesis structure with a summary of each chapter.

New Zealand faces various natural hazards due to its distinctive geographical location and geomorphic features (Doyle et al., 2023; King, 2015; Leonard et al., 2008, p. 14; Paulik et al., 2021; Roy et al., 2022; Vinnell et al., 2022). Situated on the Pacific Ring of Fire, New Zealand is prone to earthquakes (Kaiser et al., 2017). Additionally, the presence of active volcanoes, and exposure to tsunamis, poses a constant threat to the country (Dhellemmes et al., 2021; Potter, Scott, et al., 2015). New Zealand also faces the challenges of coastal erosion (Rouse et al., 2013), landslides (Benn, 2005), and intense weather events, including cyclones and heavy rainfall (Fitzharris, 2007) due to its rugged terrain and maritime climate. Historical records indicate the occurrence of multiple devastating disasters affecting the country in the past (Kerr et al., 2023; Potter, Becker, et al., 2015; Smart & Mc Kerchar, 2010). Given this history and the New Zealand's hazardscape, enhancing disaster management has been a priority for the national government.

Current disaster management legislation and policies in New Zealand strongly emphasize the role of people and communities in the pre-disaster stage to reduce disaster risks. People's engagement in the pre-disaster stage occurs at two levels – individual (National Emergency Management Agency) and collective (National Emergency Management Agency, 2023b). At the individual level, people take actions that enhance their ability to face adverse events with minimal disruption to daily life. For example, staying updated on potential hazards, familiarizing oneself with evacuation routes, understanding recommended protective behaviours, maintaining an emergency kit (Sutton & Tierney, 2006). At the collective level, people come together and collaboratively take actions for reducing risks facing their communities. For example, creating community emergency plans, identifying collective resources, volunteering in organizations that work on preparedness, helping friends and neighbours to prepare for emergencies (National Emergency Management Agency, 2023). The expectation is that a combination of such individual and collective actions will ensure that community members are best prepared to withstand the effects of an adverse event.

However, the understanding and implementation of collective actions is less standardized in New Zealand compared to individual actions. Collective action is operationalized differently across different regions of the country. For example, in Canterbury, collective actions for preparedness are framed as part of broader community development while in Wellington, such actions focus on making provisions that enable community leadership and actions post-disasters (Emergency Management Canterbury, 2023; WREMO, 2023). While locally informed approaches are valuable, we still lack a comprehensive understanding of what is happening across the different regions of the country, what is successful and what their impacts are. This knowledge is crucial to support and promote collective actions for DRR. Another challenge is that collective actions are heavily dependent on community members' willingness to participate in such efforts. But we are still unaware of the best ways to communicate about it, to raise awareness and encourage participation. Understanding these are important,

particularly because the 2019 National Disaster Resilience Strategy of New Zealand explicitly states that “collective action” by and with community members is essential “to protect and sustain society” in face of extreme events (Ministry of Civil Defence & Emergency Management, 2019, p. 31).

In this backdrop, this doctoral research aimed to contribute to our understanding of collective actions for reducing disaster risks in New Zealand and identify the effective communication strategies that can foster it.

1.1 Existing knowledge and research needs

1.1.1 Civic participation and collective action in disaster risk reduction

Academic literature acknowledges the need for civic participation and collective action in disaster risk reduction (DRR) (Bera, 2019; Ireland & Thomalla, 2011; Sapkota et al., 2015). In face of major events, individual and family-level preparedness efforts are often inadequate to substantially reduce disaster risks (Yuanjaya & Fajri, 2020) and community members might need to co-ordinate with each other and collectively share skills and resources to ensure their safety (Uscher-Pines et al., 2013). In some situations, addressing disaster risks is not possible without organizing collectively. For example, in wildfire prone areas, landowners sharing property boundaries need to collaborate with each other to implement measures like prescribed burns, and strategically placing fire resistant plants to prevent wildfires (Charnley et al., 2020; Sapkota et al., 2015). Civic participation and collective action also contribute to social capital by improving social connections and trust (Ireland & Thomalla, 2011), and help in addressing government resource deficits (Garvey & Paavola, 2022). Collective action is effective in building disaster resilience even amongst vulnerable groups (Rivera et al., 2015) and allows people to hold authorities accountable and demand better support (Bera, 2019). Thus, the academic literature provides abundant evidence of the advantages of engaging in collective action and civic participation in the pre-disaster stage.

However, literature on collective actions for DRR is still evolving. We still lack common terms, accepted practices, and principles related to collective actions in DRR. While some studies exist, they are dispersed across various disciplines and analysed through diverse disciplinary perspectives (for example, Charnley et al., 2020; and Story et al., 2020 study using different disciplinary lens). It is essential to synthesize the insights from these diverse studies to develop the concept of collective action in DRR theoretically and generate a more comprehensive and nuanced understanding using an interdisciplinary lens. Also, to encourage collective actions, we need a clearer understanding of the contexts and the community dynamics in which such actions emerge and are sustained (Schneider et al., 2020). This awareness is crucial as some studies have demonstrated that motivating communities to participate in collective actions is difficult and often unsuccessful (Godschalk et al., 2003; MacAskill, 2019). Thus, the first aim of this research is to develop an understanding of what collective actions in DRR mean.

1.1.2 Communication, collective action, and civic participation

Recognizing that collective action is important, how do we communicate about it to people and how do we encourage people to participate in the same? Previous studies have noted that communicating the broader goals of collective action in DRR initiatives and building trust among different stakeholders is important (Eiser et al., 2012; Yuanjaya & Fajri, 2020). As collective actions rely heavily on co-operation and collaboration, communication among networks of communities and different

stakeholders is essential (Dharmasena et al., 2020) for organizing people, initiating collective initiatives, sharing actionable information, mobilizing resources (Ireland & Thomalla, 2011), coordinating efforts, resolving coordination problems, and addressing challenges in a collective manner (Damtew et al., 2021; Garvey & Paavola, 2022). Activities like regular meetings and other structured opportunities allow people to meet, share experiences, and learn from each other (Greenaway & Witten, 2006), and facilitate connections among residents (McGee & Langer, 2019). However, the findings are scattered and there is still a lack of systematic understanding regarding the impact of different communication approaches on people's participation in collective actions for DRR. Our knowledge on effective communication strategies in specific contexts, the degree to which communication motivates people to participate, and the potential need for supplementary support beyond communication is limited (Ryan et al., 2020). We are still unaware of the best ways to communicate about collective actions to community members and motivate their participation (Uscher-Pines et al., 2013).

It is surprising that these questions remain unanswered considering that communication is a major component of DRR initiatives (Abunyewah et al., 2020). In the pre-disaster context, communication plays a crucial role in disseminating information about risks, shaping risk perceptions, influencing behavioural responses, and providing guidance on desired actions (Reynolds & Seeger, 2005). Researchers have extensively investigated the application of communication to encourage individual and family level actions for preparedness (Bradley et al., 2016; Glik, 2007). Still, our understanding of how communication influences collective actions for DRR is in its early stages. Recognizing this gap, Burnside-Lawry et al. (2013, p. 32) explicitly state the necessity to identify "key communication strategies ... that assist constructive collective action ... among all stakeholders" involved in reducing disaster risks. Thus, the second area I am interested in exploring is how communication can be effectively used to encourage collective action and civic participation in DRR, and what are the key considerations to improve current practice.

1.2 Objectives of the research

Considering the policy priority in New Zealand and the gap in the existing literature, the overarching objective of this research is to understand,

"How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?"

The three research questions explored are:

RQ1. What is civic participation and collective action in disaster preparedness¹ in New Zealand?

The findings are presented in Chapter 4 (Manuscript 1 and 2)

RQ2. What communication practices are used to encourage civic participation and collective actions in disaster preparedness?

¹ To narrow the scope of the study we focus on disaster preparedness within the broader area of DRR. Refer section 2.2.1 and 2.2.3 for details.

The findings are presented in Chapter 5 to 7 (Manuscripts 3 to 5)

RQ3. What are the effective approaches and considerations when encouraging civic participation and collective actions in disaster preparedness using communication?

The findings are presented in Chapter 5 to 7 (Manuscripts 3 to 5)

Table 1.1 below provides a map of the research objectives, outputs, and corresponding chapters. The thesis is structured as a *PhD thesis with publication* as per the Massey University Guidelines (Massey University). As such, the chapters are structured as publishable manuscripts.

<i>Overarching research objective: How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?</i>		
Research questions	Research objectives	Chapter
RQ1. What is civic participation and collective action in disaster preparedness in New Zealand?	<ul style="list-style-type: none"> i. To explore what is civic participation and collective action in the pre-disaster stage ii. To understand their nature and forms iii. To document the activities happening through collective actions at the community level and their outcomes iv. To identify how they emerge v. To assess what factors influence people to participate and volunteer in collective action in disaster preparedness 	4
RQ2. What communication practices are used to encourage civic participation and collective actions in disaster preparedness?	<ul style="list-style-type: none"> i. To identify what is communicated to encourage civic participation and collective action in disaster preparedness ii. To understand how it is communicated iii. To identify the emerging practices 	5,6 and 7
RQ3. What are the effective approaches and considerations when encouraging civic participation and collective actions in disaster preparedness using communication?	<ul style="list-style-type: none"> i. To identify civil defence officials', stakeholders' and community members' perspectives on effective approaches to communicate about civic participation and collective action ii. To identify main considerations when using communication to encourage civic participation and collective action 	5, 6, 7

Table 1.1 – Mapping of research questions, objectives, and chapters

1.3 Research Scope

Location - The study is conducted in New Zealand and will be positioned in the hazardscape, socio-economic, and political context of the country, as it is designed on the research needs of New Zealand and funded by the New Zealand government. Conducting the study in New Zealand helps ground the

study within the country's setting and generates knowledge which is contextually relevant and easier to operationalize.

Disaster phase - The study focuses on communication practices used to encourage volunteering, civic participation, and collective actions in the pre-disaster phases particularly for disaster preparedness.

Type of hazard – It explores communication related to natural hazards, like earthquakes, volcanoes, floods, storms, wildfires etc.

Scale of the study - The emphasis is on understanding communication practices at the grassroots levels between government authorities, civil society organization and members of the public.

1.4 Thesis outline

The thesis consists of eight chapters. The first three chapters encompass the introductory chapter, the literature review chapter, and the research design chapter. The next four chapters consist of manuscripts documenting the findings which have been submitted as journal articles²³. The last is the discussion and conclusion chapter.

Chapter 1 sets the context for this doctoral thesis. It introduces key concepts such as communication, civic participation and collective action, and disaster preparedness. It connects these concepts by examining relevant literature and practical applications, identifies a knowledge gap, and outlines the research questions that will guide this study.

Chapter 2 presents the literature review on civic participation and collective action in disaster preparedness and the communication techniques, methods, and processes that foster it.

Chapter 3 outlines the research design of this study, including the overarching philosophy guiding the research and the selected methods for primary data collection and analysis.

Chapter 4 establishes the study context in New Zealand by reflecting on what civic participation and collective action in disaster preparedness mean, how they emerge and their facilitators, barriers, and outcomes.

Chapter 5 focuses on communication practices and identifies how communication around civic participation and collective action in disaster preparedness happens within communities. It highlights the key communicators, communication networks, infrastructure and effective communication practices.

Chapter 6 examines another element of communication, the disaster preparedness narratives shared amongst community members on civic participation and collective action and discusses how they encourage or challenge such participation.

² The rationale behind the organization of chapters is explained in section 2.4 after the literature is discussed.

³ As Chapters 4-7 are standalone manuscripts, there is some repetition in content, particularly around the methods.

Chapter 7 explores emerging communication practices in supporting civic participation and collective action in disaster preparedness, particularly the use of social media and identifies the opportunities and concerns.

Chapter 8 revisits the research questions in light of the findings and offers a comprehensive discussion integrating the findings of the individual chapters. It covers the theoretical and practical implications of the thesis, its limitations, and potential avenues for future research.

Table 1.2 below provides a snapshot of the chapters and how they contribute to the thesis. This chapter guide is presented before every chapter to position the reader in the thesis.

Chapter guide			
Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.		What are we studying?
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study		How are we studying it?
Chapter 4 Manuscript 1	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Manuscript 2	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Manuscript 3	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Manuscript 4	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Table 1.2 – Chapter guide

1.5 Chapter summary

This chapter introduced the thesis and offered a brief overview of its contents. The next chapter presents the literature review and the theoretical perspective guiding the study.

Chapter guide

Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.		What are we studying?
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study		How are we studying it?
Chapter 4 Civic participation & collective action	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Existing communication practices	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Communication content	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Emerging areas of communication	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Chapter 2 Literature review

At the outset of any research, clarifying key concepts driving the study and providing an overview of existing literature is important as it shapes the direction of research and informs the researcher's decisions about the research questions and analytical approaches. So, the aim of this chapter is to synthesize the current body of literature, outline the key concepts, identify the literature gap and formulate the research questions. This chapter is structured as follows: first, I explore civic participation and collective action in disaster risk reduction (DRR); next, I discuss the communication practices employed to promote these efforts; and lastly, I present the literature gaps, research questions, and the theoretical frameworks guiding the study.

2.1 Introduction

The importance of community engagement, civic participation and collective action in reducing disaster risks is well established in both academic literature (Bera, 2019; Ireland & Thomalla, 2011; Sapkota et al., 2015) and practice (UNDRR, 2015; UNISDR, 2005). The 2019 National Disaster Resilience Strategy, which sets New Zealand's emergency management goals for the next 10 years, explicitly argues for reducing disaster risks through "collective actions" by, and with, individuals, groups, and organizations that make up the community (Ministry of Civil Defence & Emergency Management, 2019, p. 31). It aims to promote community engagement during pre-disaster times to enhance community capacities and capabilities and support collaborative community level actions that reduce disaster risks and enable effective emergency response. The overarching aspiration is to forge partnerships, networks, and alliances to cultivate a culture of connectedness, mutual support, and collective actions.

To attain this priority, the first step is to understand what such collaboration and "collective action" within communities for disaster risk reduction (DRR) implies in New Zealand and how communication can be designed to support people's participation. So, this chapter synthesizes literature at the intersection of communication, civic participation and collective action, reviewing what civic participation and collective action in DRR mean, how these concepts apply in the New Zealand context and the communication practices used to promote them both globally and in New Zealand. Informed by the review, I outline the literature gaps, research questions, and theoretical frameworks that will be guiding the study.

2.2 Civic participation and collective action in disaster risk reduction

2.2.1 Defining key terms - Disaster risk reduction, civic participation and collective action

Disaster management, also known as civil defence emergency management, refers to organized efforts to minimize the impacts of extreme events on life and well-being of people through appropriate strategies, policies, and activities (UNDRR, 2017; Ministry of Civil Defence and Emergency Management, 2002). In its early days, disaster management adopted a short-term, response centric approach aimed at addressing immediate post-disaster needs (Quarantelli, 1982). However, the shortcomings of this approach prompted a shift over the decades towards a long-term disaster risk reduction (DRR) approach which placed importance on identifying and proactively reducing disaster risks. DRR seeks to minimize disaster risks by systematically acting on the elements that cause disasters, including reducing vulnerabilities and exposure of people, improving preparedness to

adverse events, and undertaking activities that fit within the broader context of sustainable development (UNDRR, 2017). Compared to the earlier approach, where attention was given only to disaster response, the new approach adopted a holistic view and focused on four areas of disaster management known as 4 Rs – reduction (or mitigation), readiness (or preparedness), response, and recovery (Ministry of Civil Defence and Emergency Management, 2002). Disaster preparedness (reduction) falls within this 4R framework with preparedness referring to the planning and pre-emptive actions taken to ensure individuals, communities, organizations, and governments are ready to respond effectively to disasters (UNDRR, 2017). It includes activities such as building hazard awareness of people, improving their knowledge and skills on disaster preparedness, and resourcing people to reduce hazard risks.

Participation literature in disaster management and DRR draws from three related but distinct fields of study, political participation (actions for influencing governance and public policy), environmental action (relating to the improvement of environmental conditions through individual or collective actions, which can include political action), and volunteering literature (relating to people participating in addressing social, environmental, and humanitarian issues, often working with non-governmental agencies) (McLennan et al., 2016a). Broadly, civic participation can be defined as activities by people, that are undertaken outside of their immediate duties to promote the well-being of others, and contribute towards improving community life (Cnaan & Park, 2016). These activities require an investment of individual resources like time, money, knowledge or experience (Kim & Ball-Rokeach, 2006a). At an individual level, it implies a range of actions like “association participation, giving, volunteering, environment-friendly behaviours, political and social behaviours, and supporting-helping individuals” (Cnaan & Park, 2016, p. 2). While some scholars distinguish between political and civic participation (Barrett & Brunton-Smith, 2017), I use it as an umbrella term to refer to both as it is more suitable for understanding participation in DRR. In the context of DRR, civic participation can be characterized as the efforts by community members to improve community well-being by reducing disaster risks. In the pre-disaster context, it refers to a range of activities from participating in self-organized collective action for mitigating hazard risks (Charnley et al., 2020; Sapkota et al., 2015) to volunteering in community response teams (McLennan, 2022; McLennan et al., 2016b).

Collective action in the pre-disaster stage is variously conceptualized without a consistent definition. It typically refers to actions undertaken by groups of people engaging voluntarily in a common activity to pursue a mutual interest that improves the condition and well-being of the community by reducing disaster risks (Ireland & Thomalla, 2011; Story et al., 2020). For example, collaborative efforts by landowners to mitigate wildfire risks (Charnley et al., 2020; Sapkota et al., 2015), community consultations and collaborative development of response plans (Antoinette Mitchell et al., 2010), and rallies and protests advocating for mitigation of hazards facing a community (Bera, 2019). Both civic participation and collective action emphasize engaging and collaborating with various stakeholders, empowering people to take actions that improve the conditions of the community.

Integral to civic participation and collective action is the idea of community. Early studies conceptualized community as a group of people in geographical proximity and/or kinship who are bonded by stable connections and associations, who share a sense of identity and belonging and are willing to support one another (Tonnie & Loomis, 2017). However, with the rise of complex urban societies, new forms of social associations emerged, and the concept of community expanded (Wolfe, 2013). Communities now form connections and interactions based on geographical location, shared

demographic features (language, ethnicity, gender) or interests (political views, leisure activity), where individuals find a sense of belonging (McMillan & Chavis, 1986; Odella, 2012). The degree of integration of a person in various communities varies, including both weak ties and strong ties. While people are still more likely to connect and share material and immaterial resources (help, support, financial assistance etc.) with others that are similar in terms of income, social, and lifestyle preferences, connecting and sharing resources across circles of different social compositions are becoming increasingly common (Odella, 2012). Thus, in the new social environment, communities can be considered as a network of meaningful social, political, cultural, and economic relations (Piselli, 2007) in which social and spatial factors influence the formation of the connections shaping the network (DeFilippis, 2001). It is important to note that community is not a holistic unit and it does not hold resources on its own; rather it is composed of people and institutions within the network who hold these resources (Odella, 2012). However, typically, in DRR, communities are still viewed as stable cohesive groups who can be encouraged to work together to attain a common purpose of risk reduction (Curato & Calamba, 2020).

Given community is not holistic, different people have different, sometimes conflicting perspectives, interests, and priorities that they aim to advance by participating in political and public activities. Also, it is common to witness existing power structures, dominant voices, and majoritarian opinions influencing the outcomes of the participatory processes. While individual forms of apolitical volunteering generate less conflicts, civic participation associated with political processes that aim to change the status quo are bound to generate conflicts (Evers & von Essen, 2019). Thus, participation, in any form, is a contested idea with debates on who gets to participate, what is the value of their participation, and how true participation can be achieved to ensure everyone's voice is heard and respected (Bessette, 2004; Huesca, 2008; Servaes & Malikhao, 2008). It is within this contested terrain that participation in DRR is understood and implemented.

2.2.2 Participation and disaster risk reduction

It is well recognized that the active community participation across all stages of disaster management is essential (Cavallo, 2014). This recognition comes from the inadequacy of early disaster management approaches, which followed a militaristic command and control structure in which authorities and experts delivered services to the disaster affected recipient communities. Such approaches often failed to meet the needs of people after significant disasters during the 1950s and 60s prompting criticism on its efficacy in reducing disaster impacts (Quarantelli, 1982). By 1970s, a series of sociological research on disasters illustrated the importance of community involvement in disaster risk reduction efforts (Dynes, 1993; Quarantelli, 2003; Stallings & Quarantelli, 1985). Studies showed that community members often are the first responder after a crisis, and it is crucial to engage with them and prepare them. Scholars advocated a shift away from solely command-and-control approaches towards community-centred approaches (Delica-Willison & Gaillard, 2012). This shift reflects not only a commitment towards deliberative democracy, but also the practical benefits of enabling communities to identify contextually relevant sustainable solutions (Dodson & Palliser, 2019).

The call for people's participation grew over the decades. Community-based disaster risk reduction (CBDRR) approaches, which involve active participation of local communities in reducing disaster risks by leveraging local knowledge and resources, gained considerable attention (Blaikie et al., 2014; Gaillard & Mercer, 2013; Pelling, 2007; Shaw, 2012). In parallel, community resilience based

approaches grew, which aimed to leverage people's networked adaptive capacities in improving their response to disasters (Cutter, 2016; Norris et al., 2008). This interest in people's participation is reflected in the policy arena as well, with international guidelines like the Hyogo Framework for Action, 2005 and the subsequent Sendai Framework for Disaster Risk Reduction, 2015, advocating for a whole of society approach that value community participation (UNDRR, 2015; UNISDR, 2005). In New Zealand, the 2002 Civil Defence Emergency Management Act, the core legislation of disaster management, acknowledged this and stressed "the responsibility of people and communities" to be self-reliant and capable of preparing for and responding to disasters (Ministry of Civil Defence and Emergency Management, 2002, p. 32). Owing to these shifts, people's participation in DRR during the pre-disaster stages has become more common as an accepted norm.

Currently, people's participation in DRR during the pre-disaster stages takes various forms. The section below categorizes these forms into two broad areas - generating knowledge and awareness (section 2.2.2.1) and implementing of risk reduction activities (section 2.2.2.2) and reflects on people's participation in DRR in New Zealand (2.2.2.3) highlighting the literature gap and establishing the first research question.

2.2.2.1 Generating knowledge and awareness

Conventional top-down approaches to build awareness and encourage preparedness often fail to generate community interest and uptake due to their passive unidirectional nature, lacking dialogue and engagement (Sagala et al., 2009). To address this gap, interactive and engaging approaches to public education are being developed and experimented with, which feature engaging visualizations (e.g. through 3d modelling, augmented reality), storytelling, serious games, workshops, interactive sessions with experts etc. (De et al., 2020; Kankanamge et al., 2022). People's participation, in this context, happens when they engage with these communication approaches and tools and partake in discussions about hazards and preparedness (Asharose et al., 2015; Hawthorn et al., 2021). The expectation is that generating interest and awareness through engaged forms of public education and communication will prompt conversations on hazards among people, encourage them to prepare and inspire others to adopt such behaviour.

Another area of people's participation is knowledge generation through participation. The existing knowledge base was insufficient to guide the development of contextually relevant and effective interventions for reducing disaster risks. Translating DRR policies into concrete implementable actions that are both acceptable and adaptable at the local level requires an in-depth understanding of the local context (Huntington et al., 2006; Lo & Chan, 2017; Perera et al., 2020). Lack of tailoring of initiatives considering the context (Ryan et al., 2020) and imposing cut and paste models from elsewhere (Grybovych & Hafermann, 2013) often lie behind the failure of well-intended initiatives.

Here, people's participation is essential for knowledge co-creation and co-designing of solutions that are effective in reducing hazard risks. Engaging with locals through participatory processes, provides a clearer understanding of the context, including that of the lived experiences, people's understanding of hazards, locally available resources, vulnerabilities, and broader socio-cultural values, to inform policy decisions and practices. An increasing recognition of the value of indigenous local knowledge has contributed to a rise in research aiming to understand indigenous wisdom, consolidate the knowledge base and understand how practices rooted in indigenous knowledge can be synergized with practices based on scientific knowledge (Bronen et al., 2020; Saunders et al., 2024). With the rise of

digital technologies and web 2.0, communities are increasingly consulted with for the design, development, deployment, and maintenance of scientific and technological products like hazard and resource maps (Haworth et al., 2016), monitoring systems (Hicks et al., 2019), and early warning systems (Kenens et al., 2020; Macherera & Chimbari, 2016; Paul et al., 2018). Citizen science approaches are also on the rise, in which members of the public collectively participate in data collection, analysis, and problem-solving, working alongside or in partnership with professional scientists and researchers (Conrad & Hilchey, 2011). While the goal of citizen science initiatives is not specifically preparedness, citizen scientists often assist in disaster preparedness by monitoring hazards, reporting the data, mapping resources, reporting emergencies, and providing early warning, and supporting community education (Chari et al., 2019; Stone et al., 2014; Tan et al., 2022; Vinnell et al., 2021).

However, the degree of participation in these processes varies. It can range from empowering forms of participation where community members decide on the goals, objectives, and methods of the study – giving them a stronger voice in the process - to tokenistic involvement, where community members merely collect or provide data (Curato & Calamba, 2020). The tokenistic forms of engagement have been critiqued time and again for their lack of power in improving practice (Baudoin et al., 2016; Gladfelter, 2018).

2.2.2.2 Implementing risk reduction activities

People's participation in implementing risk reduction activities refers to various types of actions, ranging from volunteering in community-based disaster management groups, collective actions for resource management, engaging in community consultations to protests. The forms of participation can be categorized by looking at two parameters – i) whether participation is in the political realm or in the public sphere, and ii) whether the actions align with institutional arrangements and accepted norms or they conflict them (Evers & von Essen, 2019).

In the political realm, actions aligning with accepted norms include people's participation in governance, policy formulation, or in activities that decide how the state should operate. Early research in land use planning forms the basis of contemporary understanding of participation in public policy, much of which explores the intensity of engagement and decision-making control afforded to the public in legislative processes and governance (Arnstein, 1969). Many countries have institutional provisions for co-administration of natural resources where special interest groups like forest user groups, catchment groups formed of community members and specialists, are granted decision making authority and some degree of autonomy to determine resource management strategies and governing policies (Charnley et al., 2020; Sapkota et al., 2015). This includes establishing provisions for hazard mitigation through policy development and implementing protective measures. While rare, there are also participatory governance mechanisms, where citizens control their budget and decision-making, which enables them to make plans to reduce vulnerability and exposure, address developmental concerns, and implementing disaster preparedness programs that fit their specific needs and geographical context (Curato & Calamba, 2020). As these forms of participation are integrated in the governance systems, they align more with institutional expectations and norms.

The contested variation of participation in the political realm involves consultations and regular meetings on policies, resource governance, citizen's rights, and participatory development of risk reduction plans with interest groups and community members (Chung, 2016; Jones et al., 2014). Here,

participation is mainly in the form of communicative actions ranging from deliberation, debates, protests, and lobbying against government policies. Conflicts and contestations against the institutionally promoted agenda is common, often arising from different perspectives, interests, and stakeholders' varying degrees of power to influence the process.

People's participation is most common in the public sphere aligning with institutional arrangement. For example, local groups formed of community members variously known as the community emergency response team, village disaster management committees, community-based disaster management team, etc. (Flint & Stevenson, 2010; Ito-Morales, 2024; Ossey et al., 2017). These formal or informal groups are typically organized by governmental or non-governmental agencies. Volunteers in these groups undergo training and capacity building to undertake DRR activities like conducting multi hazard risk assessments, developing community plans, organizing drills and training, monitoring hazards, disseminating early warning information, etc., as well as to provide immediate assistance in emergencies by mobilizing resources during emergencies, and liaising with local stakeholders until professional responders arrive (Bogdan et al., 2021; Nakamura et al., 2017; Ossey et al., 2017).

Groups emerging through self-organized collective action are also observed (Garvey & Paavola, 2022; McEwen et al., 2018). For example, in regions prone to wildfires, landowners collaborate to strategize and execute measures such as prescribed burns, fuel treatments, and strategically planting fire-resistant vegetation to mitigate the risks of wildfires (Charnley et al., 2020; Sapkota et al., 2015). Groups not directly working on preparedness but involved in building social networks, working on community development, and addressing underlying vulnerabilities that cause disaster, are also of relevance and efforts underway to integrate them as local partners in disaster preparedness initiatives (Ozanne & Ozanne, 2013).

These groups operate in the institutionally accepted areas of participation, engaging in volunteering, community building, forming relations of support and solidarity, thus engaging in solidaristic and prescribed forms of participation (Curato & Calamba, 2020). The groups are dependent on government assistance (Chou & Wu, 2014) and support in forms of financial resources and knowledge transfer (Ossey et al., 2017). The government also needs to be responsive in meeting demands of the groups, to demonstrate their commitment to the cause (Walwema, 2021). However, these groups are mostly apolitical being largely removed from questioning prevailing power structures, policies, and practices. This "trend towards community-based action on ..risk" is also favourable to governments in "recourse deficits", as they support risk reduction without the government having to spend substantial resources or address structural issues (Garvey & Paavola, 2022, p. 4). Contested forms of participation in the public sphere are less documented, and involve collective action in the forms of rallies and protests to demand for better preparedness and mitigation actions for hazards facing a community (Bera, 2019).

The above review presents an overview of international literature, outlining how people participate in DRR, and the nature of their participation, which ranges from engaging in awareness and knowledge building activities, through to participation in the implementation of DRR projects. The next section focuses on New Zealand literature to understand the conceptualization and implementation of civic participation and collective action within the country, and how the above concepts apply to the country's specific context.

<i>Objective</i>	<i>Areas of participation</i>	<i>Examples</i>
Generating knowledge & awareness	Public education & awareness activities	People's engagement with the awareness activities & related conversations
	Co-production of disaster knowledge	Co-designing DRR projects, providing inputs on proposed solutions, data collection for scientific projects
Implementing disaster risk reduction actions	Governance, planning & policy formulation on disasters (Political actions)	<i>Accepted forms:</i> Co-administration of natural resources by user groups, citizen led budgeting and decision-making <i>Contested forms:</i> Engaging in debates, and lobbying against policies, organizing protests to influence government policy
	Operational activities for risk reduction (Public actions)	<i>Accepted forms:</i> Volunteering in community-based disaster management groups, collectively implementing hazard mitigation actions <i>Contested forms:</i> Organizing protests and rallies demanding hazard mitigation actions

Table 2.1 - Summary table on areas of people's participation in the pre-disaster stage

2.2.2.3 New Zealand context

Literature on people's participation in emergency management in New Zealand can be roughly segregated into three eras – the era pre Civil Defence reform (till 2000s), the post reform and pre-Christchurch earthquake (2002 - 2010) stage, and the post-Christchurch earthquake stage (post 22 February 2011).

2.2.2.3.1 Pre reform era

Disaster management in New Zealand originated in the early 1930s; however, it was in 1959 that the Ministry of Civil Defence was officially established (New Zealand Ministry of Civil Defence). The early emphasis of civil defence was on emergency response, and the post disaster studies during this period investigated the psychological and physical effects of disasters on people, and the evaluation of services and experiences of the affected people and responders (Berah et al., 1984). While there were some early studies advocating for a focus on the pre-disaster phase (Erickson, 1986), they were relatively scarce.

The Ruapehu eruptions, however, shifted the view from disasters as isolated events to recognizing them as part of a continuum where pre-disaster conditions influence post-disaster response. This generated an interest in understanding people's knowledge and perception of hazards, what influences their perceptions, and how their perceptions influence preparedness and response (Johnston et al., 1999; Miller et al., 1999). It also encouraged researchers to study the best ways to communicate about hazards and develop public education programmes aimed at improving hazard awareness and promoting protective actions (Miller et al., 1999). Much of this research, however, drew from psychological studies on preparedness and concentrated on individual level behavioural changes. It is also during this time that the idea of resilient communities started gaining traction as researchers

observed that the psychological impact was significantly influenced by community members' capacity to address the challenges they faced (Ronan et al., 2000).

2.2.2.3.2 Post reform and pre-Christchurch earthquake

The 2000s witnessed policy reforms, and the new Civil Defence Emergency Management Act 2002 (CDEM Act) came into legislation (Ministry of Civil Defence and Emergency Management, 2002). Two notable changes were introduced through the Act. Firstly, disasters were no longer viewed as isolated events. Drawing on the emergency management cycle (Petak, 1985), the concept of 4Rs was introduced - Reduction, Readiness, Response, and Recovery; and undertaking emergency management activities across the 4Rs was promoted.

The other change advocated individual and community responsibility to prepare (Ministry of Civil Defence and Emergency Management, 2002) and aimed to reduce people's reliance on the government for ensuring their safety (Britton & Clark, 2000). This aligned with the broader neoliberal political climate in New Zealand where central and regional government were shifting away from strong regulations to govern the environment and social sector towards allocating more responsibility to people and emphasizing individual action (Blackett & Hume, 2007). The Resource Management Act 1991 (Ministry for the Environment, 1991) and Local Government Act 2002 (Department of Internal Affairs, 2002) made provisions that allowed community groups to engage with regional and local authorities in planning and environment related decision-making and setting long term community outcomes many of which contribute to reducing disaster risks; thus, providing a favourable legislative climate that supported people's involvement in governance, delivering solutions, and sharing responsibilities. There were also suggestions for greater alignment between research and practice, with a focus on making research more applicable (Britton & Clark, 2000).

Following these changes, research on the pre-disaster stage surged. Aligning with the policy imperative, researchers focused on the ways people's understanding of risks can be improved and how people can be influenced to be better prepared. Substantial high-quality literature on psychological and social factors shaping individuals' preparedness (Dhellemmes et al., 2021; McIvor & Paton, 2007; Vinnell, 2020; Vinnell et al., 2019), and on public education for preparedness (Finnis et al., 2010; Ronan & Johnston, 2001; Ronan et al., 2000) has been produced since then. From occasional emergency incidents, people's role in warning provision and early response to emergencies was also recognized and the idea of community resilience gained momentum. Studies explored the concept of community resilience – what it is, and how it can be bolstered and acknowledged that people's participation and greater dialogue in emergency management processes are necessary to bolster community resilience (Becker, Paton, & McBride, 2013; Paton et al., 2010).

However, the conceptualization of people's participation was limited in scope. The focus was on involving people in emergency preparedness processes to improve their own preparedness levels; the idea was that widespread adoption of preparedness measures at an individual level would lead to an improvement in the overall preparedness level of the community and foster resilience (Dharmasena et al., 2020). This perspective, however, overlooked the fact that certain hazard related problems cannot be addressed through individual preparedness alone and will require people to act collectively to address them. For example, individual preparedness will not be sufficient to ensure community well-being in the event of a high impact earthquake and tsunami event on the East Coast of New Zealand,

where multiple communities may become isolated and will need to self-organize and lead the initial response to a potential humanitarian crisis (Crimp, 2024; Power et al., 2016).

To minimize the potential impacts, it is important that communities participate in conversations around preparedness in peace time, organize themselves, mobilize community resources and take collective community actions to improve the preparedness of their communities and mitigate issues and concerns. For example, developing community emergency response plans through dialogue amongst community members to identify the pool of resources shared within the community and how they can be accessed in times of emergency. Unlike the global literature, where community-based disaster risk reduction received considerable attention (Delica-Willison & Gaillard, 2012; Habiba et al., 2013; Shaw, 2012), literature on this topic did not gain much traction in New Zealand.

2.2.2.3.3 Post-Christchurch earthquake

The devastation caused by the Christchurch earthquakes of 2010-11 and the Kaikōura earthquake of 2016 and the ensuing response and recovery processes brought to question many of the underlying assumptions that underpinned emergency management praxis in the country, including what participation in emergency management processes really meant. This introspection was driven by different cases of community led responses, of which two cases draw attention: the response of informal volunteers associated with community-based groups like the Student Volunteer Army (SVA) (Nissen et al., 2021), Lyttleton Time Bank (Ozanne & Ozanne, 2013) and many others (Carlton & Vallance, 2013; Rudkevitch, 2022); and, the response of the local Māori (Phibbs, Kenney, et al., 2015)⁴.

It was evident that groups that responded better to the event did not rely solely on maintaining individual safety, but they were also able to organize themselves and quickly mobilize communal resources to respond to the event. Scrutinizing how they were able to attain this, scholars found that the SVA or the Lyttleton Time Bank were successful because they were able to quickly activate networks of support through their preexisting social and institutional connections (Nissen et al., 2021); for SVA, it was their network of friends, colleagues, and connections with the university clubs (Nissen et al., 2021), while for timebanks it was the existing network of consumers (Ozanne & Ozanne, 2013). The prior experience of these groups in working together for addressing practical problems (Ozanne & Ozanne, 2016) helped them work together to address needs emerging post disaster. Additionally, the presence of people with local knowledge in the networks enabled them to quickly identify the emerging needs, direct attention to people most affected or vulnerable and connect them to support providers. Thus, the “established connections and embedded knowledge and experience – and the

⁴ It is noteworthy that these occurrences are not isolated incidents. Community groups taking the lead in response efforts have been documented as far back as the 1931 Hastings earthquake (Scott, E. F., & Dowrick, D. (1999). A report on the Relief Organisation in Hastings Arising out of the [magnitude 7.8] Earthquake in Hawke's Bay [New Zealand] on February 3, 1931. *Bulletin of the New Zealand Society for Earthquake Engineering*, 32(4), 246-256. and as recently as the Maitua floods in 2020 (Blake, D., Hodgetts, D., Thompson, J., & Johnston, D. (2022). Maitua flood 2020, Aotearoa New Zealand: A case study highlighting resilience through community spirit [Article]. *International Journal of Disaster Risk Reduction*, 82, Article 103347. <https://doi.org/10.1016/j.ijdrr.2022.103347> while effective response by Māori is documented in multiple other extreme events (McLachlan, A. D., & Waitoki, W. (2022). Collective action by Māori in response to flooding in the southern Rangitikei region. *International Journal of Health Promotion and Education*, 60(1), 15-24.

interconnections between them” helped these groups rise to the occasion and quickly respond (Nissen et al., 2021, p. 8).

On the other hand, the Māori response drew on traditional institutions of iwi, hapū, and marae, and leveraged long standing relationships and existing knowledge (Lambert et al., 2012; Phibbs, Kenney, et al., 2015). They were guided by cultural values of “kaitiakitanga (guardianship and responsibility to the people)” and “manaakitanga (hospitality)” “practiced through the mobilization of resources, opening of marae, hosting and feeding the displaced” and “offer(ing) help to others as well as we can” (Carter & Kenney, 2018, p. 735). The Māori response underscored the importance of pre-existing institutions, collective processes, and knowledge and cultural values in effective response to emergencies.

Post-earthquake responses by community groups and Māori both clearly highlight that community preparedness can be enhanced significantly by fostering community connectedness, integrating local knowledge in emergency management practices, and strengthening social and institutional structures that encourage and support people to collectively address emergent needs during a crisis. This renewed an interest in understanding participation beyond individual preparedness by delving into questions such as how community networks can be strengthened, what forms of engagement and community-centred approaches will foster social support networks, and what institutional provisions made in the pre-disaster stage will enable communities to mobilize resources through existing networks and collectively respond to events.

This interest is reflected in the National Disaster Resilience Strategy, which encourages collective action with community members in a pre-disaster stage to improve resilience of communities (Ministry of Civil Defence & Emergency Management, 2019).

The academic literature in New Zealand, however, covers only certain forms of participation in the pre-disaster stage, particularly aimed at improving hazard awareness and generating knowledge for informing practice (Finnis et al., 2010; Tan et al., 2022; Vinnell et al., 2022). There is a lack of research on participation in implementing risk reduction actions in the pre-disaster stage, such as through planning and implementation of risk management activities in collaboration with emergency management agencies, joint decision making and actions for mitigating natural hazard risks and collective political action against lapses in emergency management processes in the pre disaster stage.

In practice, however, emergency management agencies are exploring different ways through which people can engage in preparedness to improve response capability of their communities. This includes volunteering with civil defence groups (National Emergency Management Agency, 2024) and New Zealand Response Teams (National Emergency Management Agency, 2024j), supporting as community champions (Hawke's Bay Emergency Management Group, 2024), being members of community response groups (Environment Southland Regional Council, 2023), working collaboratively with emergency management agencies to develop response plans (Orchiston, 2013) or identifying innovative solutions (Rnz, 2013). Improving the collective capacity of communities to respond to extreme events is a particular focus in rural communities which may face isolation during extreme events and must rely on their own resources until external support becomes available (Southland Civil Defence Emergency Management Group, 2017). Emergency management agencies are also increasingly working with other government organizations (Fire and Emergency New Zealand, New Zealand Police etc.), non-governmental organizations (Neighbourhood Support, The International Federation of Red Cross and Red Crescent Societies etc.), and pre-existing community groups (local

resident's association, sports clubs, church groups etc.) to leverage their existing social networks and institutional structures (Ministry of Civil Defence Emergency Management, 2016; Neighbourhood Support New Zealand, 2024; Wellington Region Emergency Management Office, 2013). The core belief behind promoting such engagement is that involving community members in preparedness processes prior to an event will help in forging relationships, promoting community conversations around preparedness, identifying the capacities and resources of local people and organizations, forming a shared understanding of the needs that might arise during an emergency, and the provisions that can be made to address those (Wellington Region Emergency Management Office, 2024c; West Coast Civil Defence Emergency Management Group, 2024). However, surprisingly scant literature from New Zealand documents these initiatives and their outcomes.

Literature gap and research question

Understanding the different forms of people's participation - including their outcomes, the factors influencing engagement, facilitators, and challenges - is necessary to craft strategies and policies that promote active participation, identify successful approaches, and address issues that hinder participation. Moreover, to generate a comprehensive understanding, a cross-comparative study of at least a few forms of civic participation is important. So, the first aim of this research is to systematically study the various ways in which community members participate in disaster preparedness in the pre-disaster stage in New Zealand to attain collective risk reduction outcomes. Thus, the first research question is:

RQ1: What is civic participation and collective action for disaster preparedness in New Zealand?

2.3 Communication and civic participation in disaster risk reduction

"Participation... cannot occur without communication", as participation is communication (Dagron, 2009, p. 460). Information sharing, training, engagement, dialogue, managing change that are central to civic participation – all rely on communication (Colle, 2008). In the DRR context, studies show that communication helps not only in raising hazard awareness, and sharing actionable information, but also in fostering trust and credibility, creating a conducive environment for dialogue, consensus building, collaboration, and mobilization of resources – all crucial to support collective actions (Damtew et al., 2021; McCarthy & Zald, 1977; Obregón & Tufte, 2017; Stieglitz et al., 2018; Van Zomeren et al., 2008). As such, communication forms the backbone of civic participation and collective action (Bamberg et al., 2015; Eiser et al., 2012; Smith, 2010; Yuanjaya & Fajri, 2020). Given the interdependence of participation and communication, it is important to understand how communication can be best utilized to facilitate civic participation and collective action in DRR?

2.3.1 Communication and participation

Communication refers to the social interaction of actors through symbols and message systems (Gerbner, 1966), and includes all formal and informal processes through which information is shared, interests are negotiated, behaviours are shaped, and actions are influenced (Mansell & Raboy, 2014).

Conventionally, disaster and risk communication approaches aim at knowledge transfer (informing people about hazards, warnings, educating on recommended actions etc.), and behaviour change (altering people's habits and responses to hazards, promoting adoption of recommended protective

actions etc). (Covello et al., 1986; Servaes, 2022). They rely on transmission (Sender, Message, Channel, and Receiver or SMCR model) (Berlo, 1960; David, 1960) and diffusion models of communication (Rogers, 2004) where risk information (messages) is transferred from authorities (source) to the intended audience (receiver) through one or more channels, and new ideas and behaviours are adopted as individuals process, interpret, and integrate the information into their existing knowledge and practices. For example, communication of messages from government agencies, technical advisory groups, non-governmental bodies, civil society organizations to the public, community, organizations, decision makers and other stakeholders (Hilhorst & Heijmans, 2012) - either through direct broadcast channels, or through intermediate sources who relay the message (Rogers & Sorensen, 1988). The messages contain information on risk (hazard, vulnerability, exposure, expected impact and risk information) and recommended actions (where the receiver is informed of what they should do to avoid the risk) and are framed⁵ in ways to make the issue appear more relevant and personal (Kim & Choi, 2017). While this approach remains dominant (Lejano et al., 2023), over the years, the disaster and risk communication field have expanded in other areas, of which two important areas relating to community involvement are to are public relation and participatory communication.

Public relations

Public relations (PR) refer to strategic communication processes aimed at improving the relation dynamics and forming mutually beneficial relationships between organizations and the publics (Grunig, 2013; Hutton, 1999). In the context of disasters, public relations scholarship has primarily focused on crisis management, particularly reputation management and image restoration (Coombs & Holladay, 2002; Sellnow & Seeger, 2021). However, an under-explored area is the application of PR strategies to engage with community and foster participation in DRR (Dharmasena et al., 2020).

Community relations, a subdiscipline of public relation, aim at improving organization's relationship with the public utilizing well-crafted messages, relationship development techniques, dialogic communication, and aligning organizational goals with community aspirations (Heath & Palenchar, 2000). This approach helps in improving community interactions, rapport building, constructing a shared understanding, establishing trusted relationships, gaining social support, legitimacy and co-operation, and fostering a sense of community between organizations and the publics (Heath, 2013). The rationale is that when agencies demonstrate interest in the public's needs and aspirations and allocate resources to assist them, the public is more likely to reciprocate with support and cooperation, aiding in the achievement of the mutual goals (Spialek et al., 2016).

In practice, such communication utilizes traditional media outreach, community-oriented campaigns, public events, formal and informal interactions and feedback gathering (Johnston & Zawawi, 2020). The messages and narratives aim at fostering goodwill about the organization positioning them as responsive and responsible entity and forming linkages and collaborative relationships across the community (Taylor, 2018).

While beneficial to advance common goals, PR can focus more on managing the organization's image and advancing organizational interests, than fostering genuine two-way communication (Holladay &

⁵ Framing refers to the presentation of information by setting the context in a way that leads to a particular line of thought.

Tachkova, 2021). Such approaches lead to scepticism and distrust from the community, particularly when the engagement feels insincere, manipulative and public input is not meaningfully integrated into decision-making processes. Moreover, PR communication can be hindered by power imbalances, where organizations control the narrative, marginalizing voices from vulnerable or underrepresented groups (Dutta, 2015). As a result, while PR can be a powerful tool for community engagement, its effectiveness relies heavily on its transparency, authenticity, and the organization's commitment to truly listening and responding to community concerns (Littlefield et al., 2012).

Participatory communication

Participatory communication re-conceptualizes the top-down flow of communication to a horizontal flow of communication between agencies and the community. It originated from a combination of the northern⁶ tradition of social action research and the southern tradition rooted in emancipatory philosophy (Macaulay, 2017)⁷. Central to participatory approaches is dialogue, interaction, and formation of relationships at the grassroots level (Michalis et al., 2022; Servaes, 2022). Participatory communication processes flow through a reflection and action cycle (Chou & Wu, 2014; Takeuchi et al., 2012) which typically involves activities such as identifying target groups and associated stakeholders, engaging in dialogue with them, thinking about a local problem and exchanging ideas on how to address it, collaboratively establishing shared goals and desired outcomes, identifying set of actions and suitable tools to attain them, informing stakeholders about it, seeking their inputs, creating platforms for dialogue and feedback, listening to what the stakeholders say, incorporating feedback in the initiative, planning and linking to other programmes and monitoring and evaluation (Colle, 2008). A sound understanding of the local setting and respecting the diversity in stakeholder views and actions is crucial in the process (Servaes & Malikhao, 2008).

Often a trained communication person is appointed by agencies to continually engage with and organize community members (Colle, 2008; Twigger-Ross et al., 2016). They play a crucial role in building awareness, fostering trusted relationships, encouraging thinking, facilitating local collaborations and partnerships, moderating discussions to arrive at a consensus and ensuring everyone can participate and act, particularly by helping marginalized groups develop skills, competencies, and confidence to access information sources, participate in dialogue and take actions (e.g. through training in the use of new technology) (Eisenman et al., 2014; Quinn, 2008). Use of communication techniques based on participatory rural appraisal (PRA) is common which involves collaboratively developing maps of the local area capturing people's spatial perception of their locality, resources, hazards etc., developing seasonality diagrams, matrices, timelines etc. (Bessette, 2004). Different communication channels are used, which includes mass media (like newspapers, radio,

⁶ North and south refers to global north and south which is a differentiation between developed and developing countries (based on their levels of economic development, income disparity, quality of life and political history).

⁷ The northern tradition suggests cyclical process of inquiry, action and evaluation conducted with, instead of on or for, marginalized people to attain social equity and empowerment. The southern tradition advocates for people's agency by positing that people should not be treated as passive objects of inquiry; rather, valued as active participants capable of determining their own needs and improving their lives Payne, Y. A. (2017). Participatory action research. *The Wiley-Blackwell encyclopedia of social theory*, 1-15. , Streck, D. R. (2014). Knowledge and transformative social action: the encounter of selected traditions of participatory (action) research. *Globalisation, Societies and Education*, 12(4), 457-473.

television), group media (like video, audio, photographs, posters, and banners), traditional media (like storytelling, drama, theatres, dance, songs), community media (like short-range rural radio, community newsletters), digital tools (like websites and social media) and interpersonal communication (like conversations, debates, and focused group discussions) (Bessette, 2004; Boaf, 2006; Cronin, Gaylord, et al., 2004). Interactive and creative techniques are adopted like workshops (Michalis et al., 2022), brainstorming, visualizing, visioning sessions (e.g. an audio or video is shown, the resource-persons delivers a talks and a discussion is organized), and prototyping, role playing (e.g. people are assigned specific roles and based on a hypothetical scenario, they interact to solve a community issue), question prompts, map making, etc. (Grindell et al., 2022) to prompt informal conversations about the neighbourhood, hazard knowledge, local resources etc. (Akama & Ivanka, 2010; Jamshidi et al., 2016; Kheerajit & Flor, 2013). With the rise in Web 2.0, and improvements in technology, many different ways of community involvement in research and process improvement are also being explored (Haworth, 2016; Marchezini et al., 2018; Reichel & Frömming, 2014; Strasser et al., 2019). As prioritizing contextuality and plurality is at the core of this approach, there is a lack of universally recommended techniques or concrete practice examples of how such communication should unfold, rather there are general principles on what such communication should embody and achieve.

However, over the decades the application of participatory communication has expanded leading to obscurity in the concept of participation. While participation should start from initial identification of needs and continue till the attainment of the shared goals, in reality, participation is often adopted in specific stage(es) as determined by the initiating agency guided by the agencies' interests (institutional mandates, funding etc.) or qualities of the participants themselves (interest in the problem, ownership, self-management etc.) (Huesca, 2008). For example, people's involvement may only be sought in the solution development stage to address knowledge gaps (e.g. inputs on hazard maps), gain feedback to prespecified questions (e.g. improving a warning product, evaluating response plans and infrastructure services) (Whybark, 2015). Moreover, even in most homogenous groups there are competing interests and voices - who within the community is involved in the participatory process, whose voices are prioritized, how attempts by individuals or interest groups to manipulate decisions are managed, how power relations that influence community processes are addressed and other considerations of power differentials determine whether the participatory processes were able to attain their emancipatory goals of promoting equity and social justice (Servaes & Malikhao, 2008).

Additionally, the level and intensity of participation varies, from full authority in project governance to merely a consulting role with no decision-making power (Bessette, 2004; Jull et al., 2017). Examples of the latter are when "participation is incorporated into applications clearly based on linear models of communication such as 'message development'"; when research teams gather information for their own purposes using techniques like PRA (Huesca, 2008, p. 193). Such instrumental adoption of participation does not enable communities to exercise self-determination by engaging in planning, decision-making, self-management and policymaking, collective ownership and institution-building; and cloaks top-down approaches as participatory communication, without any re-configuration of the power relations. Thus, "much of the conceptual fuzziness in this field" arises because the term is applied to signify both "participation-as-means" and "participation-as-end" (Huesca, 2008, pp. 188, 193). This severely restricts the transformative potential of participatory processes (Cornwall & Jewkes, 1995; Wallerstein & Duran, 2006).

In summary, communication practices to foster community involvement and participation are increasingly relying on public relations and participatory communication approaches alongside the dominant linear communication model. The key difference between the two approaches lie in their purpose, process and power dynamics – while public relations focus more on managing reputation and maintaining positive relationships to achieve organizational goals typically through top-down communication, showing an asymmetrical power relation with the organization controlling the narrative and flow of messages; participatory communication focuses on empowering stakeholders particularly the marginalized and under-represented groups through two way dialogue and communication, aiming to equalize power relations through shared ownership of communication processes and outcomes.

In the next section, I present four theoretical traditions in communication, participation and DRR research, and discuss how the communication approaches presented above are implemented in practice across each tradition.

2.3.2 Four traditions in disaster and risk communication literature

Communication research on civic participation in DRR draws from four broad theoretical areas – i) the cognitive-behavioural-psychological tradition of influencing preparedness factors, ii) communication studies, organizational management, education and community development research on relational communication approaches utilizing networks and relationships, iii) cultural anthropology, indigenous studies, development studies' tradition of indigenizing initiatives, and iv) the critical studies approach of addressing structural barriers and power differentials. These areas are not strict categories as many overlaps exist, rather, they help in organizing the literature by delineating the conceptual divides based upon differing guiding philosophies, areas of theoretical attention, perspectives on human behaviour, the social world, and power structures. The traditions are discussed below.

2.3.2.1 *Influencing preparedness factors*

Guided by the information deficit model, early communication approaches considered the lack of knowledge and incorrect risk perceptions about natural hazards as the reason for people not preparing adequately. So, with this knowledge deficit model in mind (Doyle & Becker, 2022), the aim of emergency managers was to provide the best possible information about the hazards and the recommended protective actions to improve preparedness.

However, providing risk information did not necessarily translate into people adopting preparedness actions. So, one group of researchers focused on understanding the cognitive framework that people use to make decisions (Covello et al., 1986; Doyle et al., 2022; Morgan, 2002; Tversky & Kahneman, 1974). The aim was that the findings would help identify the best ways to communicate 'experts risk judgements' to 'laypeople' to help them understand hazard risks, correct their risk perceptions, and prompt them to adopt 'rational' actions to protect themselves (Fischhoff, 1995). The other group of researchers modelled the psychological processes that individuals undergo before taking preparedness actions – including receipt of hazard related messages, interpretation of the messages, formation of intentions to act and taking action - and explored what factors influencing this whole process like risk perception, efficacy beliefs, outcome expectancy, social norms, sense of community, etc. (Ajzen et al., 1985; Lindell & Perry, 2012; Rogers, 1975).

Drawing on this combined knowledge base, communication researchers examined the effect of modifying different parameters within the communication process, such as the message content (actionable information model) (Wood et al., 2012), framing (normative theories etc., positive, and negative frames) (Solberg et al., 2010; Stephens et al., 2022; Vinnell et al., 2019), format (game, augmented reality, virtual reality)(Bonaiuto et al., 2016; Kundu & Nawaz, 2017; Solinska-Nowak et al., 2018), channel attributes, sender characteristics (research on trust, credible communicators) (Lejano et al., 2018; Sharpe, 2021a), etc., on preparedness actions. With the advancement in technology and Web 2.0, there is a proliferation of studies examining the potential of non-conventional channels like online portals, social media, mobile apps, and others in preparedness communication (Wukich, 2020) (Hughes & Palen, 2009; Sutton & Veil, 2017; Tan et al., 2017). Use of audience segmentation principles in tailoring communication based on the awareness and interests of recipients is also explored (McBride, 2017; Rimal & Real, 2003). Others investigated the effect of different communication techniques like information and advice dissemination, public education programmes, meetings, workshops, seminars and trainings, exercises, drills, games, memorials, storytelling, and others in generating engagement (Ryan et al., 2020).

To date, most awareness campaigns, public education initiatives and social marketing strategies⁸ for communicating about preparedness draw on the SMCR model. This approach to communication is favoured as they are suited to mass communication techniques and it is easy to evaluate the effectiveness of such communication (responses) using empirical methodology, by varying messages and sources (Servaes, 2022). This has contributed to the development of a strong literature base under this tradition.

While research in this tradition provides a robust starting point, it focuses on targeting community members' social psychological factors that promote preparedness. Contemporary research indicates that there is value in exploring the social (e.g. social networks, relationships etc.), cultural (worldviews, knowledge systems etc.), and structural (power, equity etc.) factors that enhance preparedness, and understanding how communication can influence them. This has led to the advancement of research under these traditions which is described next.

2.3.2.2 Leveraging relational networks

People are socially situated in networks of relationships. They rely on these relational networks to access information and mobilize resources to attain personal objectives - including to maintain safety and security before, during, and post emergencies (Aldrich & Meyer, 2015; Imperiale & Vanclay, 2016). These relationships, governed by norms of reciprocity and trust, function as a collective resource within a community known as social capital and facilitates cooperation, self-organization collective actions for mutual benefits within a community (Lin, 2001; Putnam, 2000a). Studies have consistently shown that communities with higher social capital respond better to emergencies and are more resilient (Aldrich, 2017; Kwok et al., 2019; Vallance & Rudkevitch, 2021). Therefore, currently there is

⁸Strategic communication approach aimed at influencing behaviours and attitudes for beneficial social outcomes through suitable communication techniques and targeted interventions Finnis, K. (2004). Creating a resilient New Zealand: Can public education and community development campaigns create prepared communities? An examination of preparedness motivation strategies. Ministry of Civil Defence & Emergency Management.

an increasing emphasis on enhancing social capital within communities by promoting social interactions, connectedness, and trust (Uekusa et al., 2022).

Research also shows that as people engage in social interactions, they learn from the experiences, actions, and feedback of others within their social networks (Bandura, 1969). This social learning process influences people's knowledge, skills, behaviours and attitudes on preparedness (Lejano et al., 2023; Samaddar et al., 2015). Continued interactions between community members also shape their perception and aspirations about their neighbourhoods, encourage greater civic engagement and prompt mobilization against collective concerns (Broad et al., 2013).

Based on the above, it can be argued that people's social networks not only enable them to access information and resources, but also significantly influence how they perceive and respond to hazards - including their willingness to engage in collective actions to reduce disaster risks. Building on this understanding, the relational network approach to disaster and risk communication seeks to enhance preparedness and resilience by leveraging the connections and social networks within communities.

Guiding the relational network approaches is a communication ecology perspective that investigates the communicative networks that people are connected to, and rely upon, for attaining everyday tasks (Broad et al., 2013; Houston, Spialek, et al., 2015). At the community level, these networks comprise of different communicating actors who serve as sources of information and meaning-making (such as mass media, official agencies, community newsletters, community leaders, friends and neighbours), and communication resources that facilitate community interactions, connections, exchange of information, and meaning-making (such as community noticeboards, public libraries, community spaces) (Kim & Ball-Rokeach, 2006a). It is this communication ecology or network that define people's access and understanding of information, the meaning-making processes, as well as their ability to mobilize and secure resources required for addressing their needs, including for achieving preparedness tasks.

An important element of the communicative networks is the quality of these connections and relationships, particularly trust (Sharpe, 2021a). Studies show that communication from trusted peers or credible communicators are more likely to be accepted and acted upon than messages from official sources, especially concerning natural hazards and disaster risks that are often beyond personal experience, unknown and uncertain (Lejano et al., 2018). Additionally, previous research shows that promoting interactions between community members fosters community connections and positively influences community participation and collective actions (Kim & Ball-Rokeach, 2006a).

Drawing on the above, communication practices adopting a relational approach focus on forming mutually beneficial relationships between organizations and the public mainly through public relations (Vázquez et al., 2024) and sometimes, though rare, through participatory communication. Theoretical frameworks like the IDEA model provide a robust framework to guide such communication (Sellnow et al., 2023). For example, the IDEA model argues that organizations should integrate internalization (ensuring the spokespersons are perceived as competent and credible, messages resonates with the public's beliefs and values and communication is guided by empathy and listening), distribution (spreading the message through appropriate channels to maximize access and minimize chances of mis/dis information), explanation (providing accurate, timely, transparent and understandable information), and action (include directives and actionable information, encouraging the audience to take the necessary steps based on the message) to ensure that messages are understood, trusted, and

acted upon by the public. For emergency management agencies, this involves understanding the communication networks and relationships within a community and engaging the trusted person who holds relationships within the community, such as leaders or thought influencers, or a community champion from within the community communication networks, such as a well-connected community member invested in preparedness, to promote preparedness information and collective actions within the community. It also relies on relationship building with communities which often involve long term engagement through formal (such as workshops, meetings etc.) and informal communication approaches (such as interpersonal conversations, presence in community events etc.) to establish presence within the community. Often emergency management agencies appoint a skilled facilitator, communicator or community development personnel to lead the communication activities.

At the community level this also involves promoting formal and informal networks of connections and relationships among community members that instil a sense of goodwill, reciprocity, and community as these are crucial to enable collaboration, participation and collective actions for disaster preparedness (Houston, Spialek, et al., 2015). Such community networks are facilitated through community development strategies such as promoting neighbourhood days, stimulating social interactions, conducting visioning and resource mapping exercises, and others that aim to promote community conversations, foster community connections, and support community driven collaborative problem solving that leverages existing skills and resources.

2.3.2.3 Indigenizing initiatives

How people understand, perceive, and view risks is heavily influenced by their lived experiences, social interactions (Blumer, 1986), and cultural contexts (Douglas & Wildavsky, 1983; Kahan & Slovic, 2005). These views do not necessarily align with the objective scientific views and often contradict scientific assumptions of rational behaviour (Tansey & Rayner, 2020). Understanding these differences between the scientific views and the community view is necessary to contextualize policies, programmes, and products and make them relevant, useable, and acceptable to the people (Bogdan et al., 2021; Lejano et al., 2021).

Recognizing this, there is an increasing adoption of processes that decolonize risk knowledge through the adoption of co-creation (alternatively called co-design or co-production) principles (Van Manen et al., 2015; Vellotti & Murphy, 2020; Whybark, 2015). They draw from a social constructivist lens, which recognizes diversity and pluralism in the ways people understand and respond to their environment (Chipangura et al., 2016). This goes beyond expert knowledge and considers local knowledge, community narratives, and social learning processes for the co-production of risk knowledge (Lejano et al., 2021). By engaging with people and learning from them, it aims to understand the knowledge, values, beliefs and intellectually and culturally diverse frames of reference guiding people in risk related decision making.

One of the main areas of interest here is indigenous and local knowledge. Local knowledge refers to the observational and experiential knowledge that communities develop through their interactions with the surrounding environment (Cuaton & Su, 2020; Hadlos et al., 2022). Indigenous knowledge, on the other hand, refers to the traditional knowledge existing among local people which is transmitted across generations, and which encapsulates the collective experiences over generations, relationship with the environment, institutional frameworks and values and belief systems (Kelman et al., 2012; Mercer et al., 2010; Semali & Kincheloe, 2002). These knowledge systems influence people's views of

hazards and, along with a consideration of the local needs, skills, and resources, guides their coping strategies and actions (Hadlos et al., 2022). Through co-creation processes, researchers are able to systematically explore this rich knowledge base, understand why different views arise and how that informs community understanding and practices, identify gaps, discrepancies or conflicts with the scientific views, and find ways to synergise them to inform policy and practice. It aims at identifying optimal solutions by engaging with and adopting different epistemological positions (Crawford, 2009).

Another area where co-creation principles are implemented is for the development of risk reduction initiatives, products, or solutions (Jahangiri et al., 2011). Ideally it envisages collaboration and collective action among initiating stakeholders (often researchers or public agencies, NGOs) and community members beginning from determining the problem, defining the aims, gathering data, analysing them, designing solutions, through to the final stages of implementation and evaluation (Tran & Kim, 2023). By working closely with end-users, such processes aim to develop a shared understanding of local needs and aspirations, and establish common goals to achieve and design solutions collaboratively that address those needs considering local conditions, socio-cultural values, skills, and resources (Beaulieu et al., 2016; Samaddar et al., 2015). For example, co-creation processes are widely used to integrate local knowledge with professionally developed outputs like maps (Luke et al., 2018; Minucci et al., 2020), plans, reports, or scenarios (Davies, 2019), etc., to create a shared understanding of the local environment and the hazardscape. Such processes also aim to empower the local communities by affording more agency (e.g., deciding what needs are to be prioritized, how they are to be addressed), amplifying local voices, promoting learning and skill building, and effecting meaningful changes in their communities.

Guiding all co-creation processes is participatory communication. Here, indigenous and local knowledge and worldviews serve as the basis for exploring alternative approaches to solve problems (Cornwall & Jewkes, 1995). Therefore, valuing all forms of knowledge and treating people as equal partners respecting the plurality of views is crucial in the process (Servaes & Malikhao, 2008). It also requires long and sustained engagement with stakeholders to build trust, partnerships, and social institutions critical for success and sustenance of the initiatives (Kulatunga et al., 2010).

Emotive and evocative forms of communication such as storytelling and narratives are increasingly utilized in communication processes (Cronin, Petterson, et al., 2004). Narratives are used because they can convey complex hazard and risk information in simple engaging ways, and are more likely to foster personal involvement, empathy, and alternative ways of thinking (Fisher, 1985; Shen & Edwards, 2023). Additionally, indigenous and local knowledge is preserved within oral traditions and narratives, which are difficult to frame in rational scientific ways, but can be conveyed in a compelling manner using narratives (Dahlstrom, 2014; Ratcliff & Sun, 2020).

2.3.2.4 Addressing power differentials

An area of interest for early sociological and anthropological studies on disasters was to understand why the poor and the marginalized are disproportionately affected by disaster impacts (Kreps, 1984; Oliver-Smith, 1996). Studies established that disasters occur because of an interaction of hazards and vulnerabilities and the pressure and release model (PAR) was proposed (Blaikie et al., 2014; Tierney, 2020). The model explains how vulnerability arises from underlying socio-economic, and political conditions, dynamic pressures (lack of training and skills, poor environmental conditions etc.), and unsafe conditions (societal situation that arises because of the previous conditions, and result in fragile

environments and economy, lack of preparedness etc.). When hazards interact with these vulnerabilities, they cause disasters (Blaikie et al., 2014). Extant research on poverty and development informs this understanding of vulnerability - that it does not arise from a lack of knowledge, rather it arises from a lack of resources (financial, human, social), political power, and the inability to exercise basic human rights (access to education, health services, livelihood) (Dagron, 2009; Nussbaum, 2006; Sen, 1999). The absence of the above compromises people's ability to reduce their risks by adopting recommended measures, and cope with or adapt to hazards (Comfort et al., 1999; Faas, 2016). Thus, it connects disasters with political structural factors and developmental deficits (Oliver-Smith, 1996).

Scholars under this tradition also adopt participatory communication; however, an explicit focus is on the social, economic, and political structures that contribute to marginalization and the aim is to achieve emancipatory outcomes by bringing about structural changes (Wallerstein & Duran, 2006). This draws from the Southern tradition of participatory communication that advocates the principles of self-determination, democratization, and transformation. It suggests that participatory processes should be utilized to enable communities to self-determine their goals and approaches to achieve them voluntarily (Colle, 2008). The emphasis is on human agency and capability - that everyone should be treated as fully human subjects and the changes in people's lives are brought about with, and by, the people rather than on them (Chambers, 1994). Attaining the above requires cultivating people's critical conscience and developing capacity for action, such that they are capable of questioning societal structural and changing them. A mere transfer of knowledge from authority to people will not achieve this (Bessette, 2004; Colle, 2008). It also argues for democratization of participation - ensuring inclusivity and accessibility and addressing structural forces like bias, stigma, and exclusion to ensure people from all strata in the society can participate (Huesca, 2008). Ultimately, participatory communication should aim at transformation by challenging prevailing discourses, building progressive institutions, and directly addressing power differentials in the society to truly liberate people. As competing interests exist even in fairly homogenous societies, and the elite may be reluctant or resist re-distribution of power (Servaes & Malikhao, 2008), participatory communication that is not guided by a pre-defined structural goal "runs the risk of dissolving into a self-indulgent exercise or being co-opted by an established and elitist organization" (Huesca, 2008, p. 190). While participatory communication alone is insufficient to attain such changes, it is a necessary element (Huesca, 2008).

Techniques and tools similar to what is discussed in the previous section (Indigenizing initiatives) are adopted to address socio economic and political issues with the long-term normative focus on transformation and bringing about social change. Communicative actions here are structured to stimulate change from within a community by engaging in dialogue, deliberation, debate, analysis, and action (Bessette, 2004). Such "deliberation...does not define the solution or even, necessarily, the problem in advance" rather it "offers the chance for people of contending viewpoints to jointly develop concepts and action agendas hitherto unimagined" (Johnson, 2012, p. 973). Building this capacity for action requires not only a provision of technical knowledge and skill development, but also awareness-raising, organization, and mobilization (Bessette, 2004; Colle, 2008). For example, with marginalized groups, communication needs to build networks with government agencies and other organizations which are often weak or non-existent, improving skillsets and confidence, (Pertwi et al., 2022), addressing embedded stigma (Klaiman et al., 2010) (Ossey et al., 2017) and ensuring respect and dignity for all. It also requires subverting mainstream assumptions that perpetuate conditions of

subjugation through advocacy, lobbying and campaigning (Evers & von Essen, 2019) to institutions, community leaders, people in power positions and the public (Colle, 2008). Such communicative actions are crucial to ensure equitable participation in decision-making processes, attaining policy or governance level changes that democratize access to resources (e.g. through enactment of participatory budgeting), and collaborative implementation of agreed upon changes to reconfigure power differentials (Curato & Calamba, 2020; Hügel & Davies, 2020).

Disaster and risk communication landscape: Integrating the traditions

Integrating the four traditions presented above, existing literature on disaster and risk communication can be visualized as the figure below (Figure 2.1). The four ovals show the four theoretical areas, key theories and their priorities: influencing preparedness factors, utilizing relational approaches, indigenizing initiatives and addressing structural barriers. The overlapping areas between the ovals show theories incorporating principles from more than one tradition (e.g. the IDEA model aiming at both influencing preparedness factors and utilizing relational approaches).

The integrated framework of four theoretical traditions proposed above fits well with the 4Rs conceptual framework of Reach, Relevance, Receptiveness, and Relationships for disaster communication derived from empirical data (Marlowe et al., 2018). Reflecting on Craig (1999)'s metamodel of communication, the four traditions of disaster and risk communication - influencing preparedness factors, utilizing relational approaches, indigenizing initiatives and addressing structural barriers - can be mapped to sociopsychological tradition (communication as behaviour influenced by psychology), cybernetic (communication as a system of information exchange) and some sociocultural (communication as the creation of social reality) and phenomenological tradition (communication as personal experience and dialogue), phenomenological and sociocultural tradition and critical tradition (communication as a way to challenge power and injustice) respectively in the metamodel. Aligning with Craig's argument, I highlight that each tradition has its unique strengths, and an integrated approach incorporating principles from all four traditions is likely to be most effective.

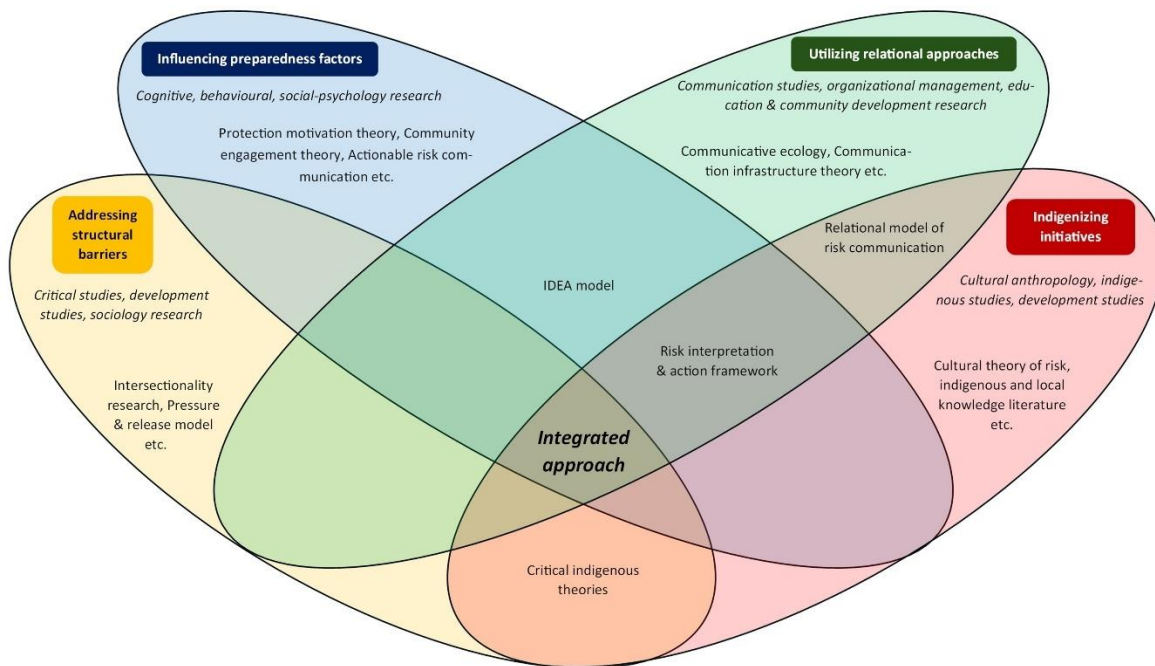


Figure 2.1 - Diagram showing four traditions in disaster and risk communication literature

2.3.3 Communication landscape in New Zealand

The previous section outlines four traditions in literature related to civic participation and communication in DRR. The following section explores the current communication landscape in New Zealand with reference to each of these traditions⁹.

2.3.3.1 Influencing preparedness factors

As the legislative emphasis shifted to improving individual preparedness in New Zealand, both academia and practice focused on ways preparedness can be enhanced through public education, and strategic communication processes.

Early research was rooted in cognitive and psychological theories and, to date, research in this tradition remains the strongest. Studies explored factors such as how varying message content (Doyle et al., 2018; Potter et al., 2018; Thompson et al., 2015; Vinnell et al., 2019), framing (McClure et al., 2009), and format (visualizations, games, simulations etc.) (Clive et al., 2021; Dohaney et al., 2015) influences people’s preparedness actions. Other studies explored how using different communication channels (Wei et al., 2017) to address these factors also influenced preparedness levels. Studies also experimented with different communication approaches, such as how incorporating hazard education into school curricula (A. Johnson et al., 2014), or organizing memorial events (Thomas et al., 2020), etc., influences people’s awareness and behaviours and the implications of the findings for communication practice. Currently, there is also a rise in research exploring citizen science uses (East Coast Lab, 2024) for educating people and generating interest in preparedness. The persisting low

⁹ The subheadings in sections 2.3.2 and 2.3.3 are repeated intentionally to explicitly link the two sections - the theoretical traditions and how each of them manifests in New Zealand.

levels of preparedness have also prompted studies on whether people's information needs are met (Becker et al., 2019), why people do not engage in preparedness activities and drills (McBride et al., 2019), and what is the effectiveness of different public education initiatives (Finnis et al., 2010; Johnson et al., 2014).

In practice, emergency management agencies relied on public education programmes, awareness campaigns and social marketing techniques to inform people about different hazards prevalent in the country and the recommended preparedness actions. This resulted in the development of standardized communication products like brochures and posters, information guides, toolkits, videos, and online resources, and their dissemination across various platforms such as radio, print media, and now, social media (National Emergency Management Agency, 2024e, 2024g). There was also a focus on delivering clear, concise, and consistent messages about hazards and recommended actions. For example, "Long or Strong, Get Gone" for tsunamis, or "Drop, Cover, and Hold" for earthquake shaking provide simple actionable advice on the recommended actions for specific hazards (National Emergency Management Agency, 2024a, 2024k). To familiarize people with recommended actions, drills like the ShakeOut are held (a nationwide drill where individuals, schools, business, and organizations practice response actions to earthquake annually on a designated day (Becker et al., 2016; National Emergency Management Agency, 2024i). Additionally, regional councils and civil defence emergency management (CDEM) groups undertake public education initiatives featuring materials tailored to the local context (Becker, Paton, & McBride, 2013).

In terms of civic participation, national portals provide information on volunteering in preparedness (National Emergency Management Agency, 2024). However, the CDEM Act 2002 does not specify volunteer roles or requirement, leaving it to local CDEM groups to decide whether to recruit volunteers and for what purposes (Robertson, 2003). As such, information about volunteering varies across regions. Volunteers, where recruited, are generally sought through CDEM websites and online portals (Otago CDEM Group, 2024; Selwyn District Council, 2024a). However, in some regions, media campaigns, promotions and special programmes are run to attract interest and recruit volunteers (Fire Emergency New Zealand, 2014). However, most of these follow a one-way communication approach.

Though these communication initiatives, particularly the hazard messages, have achieved some degree of success in promoting recommended actions (Becker et al., 2023), the preparedness level is still low (National Emergency Management Agency, 2023a; Paton et al., 2015). The structure and delivery of preparedness communication is blamed for this, and a move away from passive presentation of risk information to more dialogic communication (Becker, Paton, Johnston, et al., 2013) is suggested. This shift involves considering the context, facilitating trust, and acknowledging other societal factors that influence preparedness (Paton, 2008; Paton et al., 2010). Recognizing this, one of the objectives of the NEMA public education programme strategy (2016) is to promote active engagement through diverse channels and develop interactive resources, marking a shift in focus from mainly one-way dissemination to incorporating dialogue and feedback loops into the process (Ministry of Civil Defence Emergency Management, 2016).

2.3.3.2 Leveraging networks and relationships

The persisting low levels of preparedness, despite robust public education and awareness campaigns have prompted research on other ways to promote preparedness. The Christchurch earthquake and subsequent emergencies (Blake et al., 2022; Department of Internal Affairs, 2024), demonstrated that

people respond better to extreme events when they are connected through formal or informal social relationships that enable them to mobilize community resources and assets (Thornley et al., 2015). It demonstrated that “interconnectivity of ... communities and individuals ... has the potential to enhance resilience if the network can act collectively and proactively towards mitigating and preparing for disaster” (Orchiston, 2013, p. 490).

This has prompted civil defence agencies to adopt a holistic outlook about preparedness. This outlook considers people’s social situatedness and aims to strengthen people’s networks, connections, and relationships to improve their capacity to respond (Aldrich & Meyer, 2015). Given that New Zealand has a weakened community structure and lack of connection to community networks (Finnis, 2004), an emphasis in communication is highlighting the role of people’s social circles during emergencies, urging them to form mutually supportive networks that can provide assistance in times of crisis (Auckland Emergency Management, 2024; Wellington Region Emergency Management Office, 2024c). For example, promoting the message “Know your neighbour”, by mentioning that people who know each other are “more likely to look out for each other, especially during and after an emergency”, encouraging neighbours to swap contact information and discuss emergency plans, host neighbours day to form neighbourly connections, etc. (National Emergency Management Agency, 2024d).

This approach also represents a shift from the general mass communication techniques towards an interactive dialogic approach of delivering preparedness communication. The “Know your neighbour” message presents a call to action for local people, motivating them to spread preparedness related messages in their own communities, thereby assuming the role of local communicators of preparedness in their neighbourhoods. It moves beyond simply providing instructions for individual preparedness. It demonstrates greater trust in the community’s ability to take informed decisions, build relationships and support networks within their neighbourhood and harness the community’s collective capacity when needed.

Leveraging local people as communicators is consistently considered as a superior approach as it is more likely to generate interest, foster trust, and produce more understandable, relatable, and contextualized information (Lejano et al., 2022). Agencies are also partnering with pre-existing community groups like local associations, clubs, supporting agencies, and others to encourage preparedness within their respective constituencies (Southland Civil Defence Emergency Management Group, 2017). This aligns with the shift suggested in New Zealand’s National Emergency Management Agency (NEMA)’s public education strategy 2016, that recommended a move away from a national level spokesperson promoting preparedness to a voice of others (VOO) and voice of experience (VOE) approach. In this, local people who are leaders and influences, or people who have experienced impacts of an emergency, are invited to generate conversations around preparedness in a way that is adapted to the local level and thus are more relevant, less technical, and have improved reach through using their own networks (Ministry of Civil Defence Emergency Management, 2016).

Academic work inspired by an ecological and relational view of communication is comparatively limited in Aotearoa New Zealand. Most studies have focused on ways the relationships between emergency management agencies and people can be enhanced, for example, by adopting public relations based approaches (Dharmasena et al., 2020), or through the use of humour (McBride & Ball, 2022). While some studies have explored the role of trust (Paton, 2008), community conversations (Becker et al., 2017), and community gathering places (Kwok et al., 2016) on improving individual

preparedness and community resilience, its implications for communication practice are not discussed. Thus, academic literature in New Zealand on utilization of networks and relationships to promote preparedness and associated considerations is still scant and should be prioritized in future research.

2.3.3.3 Indigenizing initiatives

Aligned with global research, findings from New Zealand also highlight that different worldviews and perspectives shape people's understanding, behaviours, and actions regarding risks (Kenney et al., 2023). Diverging opinions on the causes of hazards and the necessary actions exist even within the same communities (Langer & Wegner, 2018). Developing shared understanding of hazards and establishing common goals and practices therefore becomes imperative.

Recognizing this, there is an increasing interest in understanding how risk management practices can incorporate local knowledge and perspectives (Kilvington & Saunders, 2019; Resilience to Nature's Challenges, 2024a), and be better informed by lived experiences of the local people (Bray et al., 2023). By adopting participatory communication processes, local people are being engaged to co-produce knowledge (Brown et al., 2019; Le Coz et al., 2016) and co-create products (Davies, 2019), and innovative solutions that are suited to the local needs and preferences, and are more relevant and acceptable.

Efforts are also underway to synergize different knowledge systems, moving away from solely Eurocentric knowledge, western rationality, and empiricism (Rout et al., 2024). In New Zealand, a rich wealth of indigenous Māori knowledge exists which is rooted in intergenerational wisdom, values, and the Māori worldview of interconnectedness, balance, and harmony between humans, the natural world, and the spiritual realm (Hikuroa et al., 2019; Lambert & Mark-Shadbolt, 2021). The Western and Māori knowledge systems view hazards, management strategies, and structures of governance differently, which causes tensions and difficulty in establishing shared goals (Dunlop, 2023). Valuing the Western knowledge system over indigenous knowledge has not only led to the loss of valuable insights and solutions, but has also delegitimized indigenous knowledge as "non-scientific," relegating those who hold it to a subordinate status (Smith, 2019).

Currently, there is an increase in research that actively engages with the indigenous knowledge systems. Adopting a dialogic learning process, such research identifies how indigenous knowledge and cultural values can be integrated with contemporary knowledge and practices for hazard identification, prevention and management (Pardo et al., 2015; Resilience to Nature's Challenges, 2024b; Živković & Heikell, 2022). Research designed and led by Māori scholars, providing insider perspectives, are on the rise (Kenney et al., 2023).

The National disaster resilience strategy recognizes the role "kaupapa Māori and tikanga Māori - plays in our wider resilience" (Ministry of Civil Defence & Emergency Management, 2019, p. 21). However, while some examples of integrating indigenous knowledge and perspectives in official disaster risk communication and management can be observed (Andrews et al., 2015; Gabrielsen et al., 2018), its adoption in regular practice is still sporadic and limited (Živković & Heikell, 2022).

2.3.3.4 Addressing power differentials

Another area of communication research focuses on empowering marginalized groups by democratizing¹⁰ their access to information, resources, and decision-making processes so that barriers and inequalities that limit marginalized people's ability to reduce their hazard risks are addressed and their safety and well-being can be ensured (Freudenberg et al., 2011). This is done by working with marginalized groups, creating platforms where people can voice their concerns and express their perspectives, amplifying their voices, facilitating dialogue among all stakeholders, generating interest in positive structural and social changes, promoting collective action, and creating suitable institutional and social support systems to foster positive changes in their living conditions (Bessette, 2004).

Research and practice in this area is least developed in New Zealand. Most preparedness communication studies focus on improving preparedness levels of general population by understanding overall population characteristics and empirically testing communication approaches and solutions (Spector et al., 2019). However, certain groups continue to have low preparedness levels (Gray, 2022; Holden, 2024; Marlowe et al., 2022; Marlowe et al., 2018; Phibbs, Good, et al., 2015; Tran, 2023; Uekusa & Matthewman, 2023) and these groups require targeted in-depth studies to fully understand their communication and information needs. Yet this knowledge remains largely unavailable which hinders the development of effective communication and participatory interventions to empower such at-risk groups and enhance their preparedness levels.

The gap is reflected in the practice of preparedness communication. Currently, it is understood that people do not prepare because they are unaware, apathetic, or complacent (preparedness level study 2023 NEMA). So, the emphasis of communication in the country has been on public education for generating awareness of hazards and recommended actions (like keeping emergency kits ready, knowing evacuation routes, practicing drills, staying connected with local community etc. (National Emergency Management Agency, 2024c) and encouraging people to adopt these actions. It highlights that the actions are easy to take adopt (Blake et al., 2017), and reiterates that it is the responsibility of individuals and communities to prepare.

However, missing from this approach is a recognition of people who might not be in a position to adopt the recommended measures because of their differential access to socio-economic resources and specific life situations. For example, people from lower socio-economic groups have access to significantly less financial resources. The costs associated with arranging emergency kits and implementing recommended preparedness measures can be overwhelming and hence not implemented (Blake et al., 2017; Finnis, 2004). For new migrants, building strong social networks in the initial years of resettlement is often a challenge (Marlowe et al., 2022). Thus, there is a glaring lack of consideration of the everyday inequalities that constrain people from adopting preparedness actions (Blake et al., 2017; Marlowe et al., 2022). This lack of consideration extends to other groups as well, like big-bodied people (Gray, 2022), culturally and linguistically diverse communities (CALD),

¹⁰ Ensuring everyone within a society have access to resources, opportunities, information, and decision-making processes, irrespective of their background, socio-economic status, or other factors that might otherwise limit their access.

disabled people (Hay & Pascoe, 2019), and LGBTQI people (Gorman-Murray et al., 2018) who might have different information and resource needs.

The current approach also fails to acknowledge the power dynamics, political divides, and conflicts that exist even within the same communities on risks management decisions and responsibility attribution for remedial actions (Langer & Wegner, 2018). This ignorance of power relations often extends to how the relationship between indigenous groups and the state is perceived as well (Bohensky & Maru, 2011).

The failure to acknowledge systemic inequalities and power differentials has influenced the design of communication strategies and their capacity to reduce risks of marginalized groups. Standardized communication messages carry limited guidance on how people, who are unable to prepare because of informational or resource limitations, can secure what they need, how organizations and the wider community can support them, and where more information on supporting them can be obtained (Blake et al., 2017). While studies have identified the need for more community development approaches (Paton, 2013; Ronan et al., 2000), greater integration with community-based agencies like the Ministry for Social Development (Becker, Paton, & McBride, 2013), and involving social workers in emergency management processes (Hay & Pascoe, 2021, 2022), its adoption in practice remains at a nascent stage. For example, how organizations that help settle newly arrived families can engage in emergency management practices to improve the bridging and linking capital of these families (Marlowe et al., 2022). Identifying alternate pathways to improve preparedness and communicating about them is essential - without it, communication aimed to increase awareness or addressing complacency will have limited effect. Owing to these deep-rooted issues, preparedness communication in the country can be critiqued as a “discourse for the privileged” (Blake et al., 2017) and a growing cohort of researchers are calling for a move away from resilience focused approaches to utilizing a critical disaster studies and social justice lens in emergency management processes. (Blake et al., 2017; Uekusa et al., 2024).

Literature gap and research questions

An individualistic narrative dominates the discourse on disasters in New Zealand (Blake et al., 2017; Carter & Kenney, 2018). Consequently, communication to reduce disaster risks by engaging people also adopts an individualized lens focusing on individual actions (Becker et al., 2012), adaptive capacities (Dharmasena et al., 2020), and responsibility to prepare (Bryner et al., n.d.; Ministry of Civil Defence and Emergency Management, 2002). While the “current communication and public education activities are likely to be having an impact on individually focussed factors”, they are less likely to influence “community participation” and collective actions, which “remain areas where specific targeting is required” (Becker, Paton, & McBride, 2013, p. 14). Particularly there is a need to develop knowledge of the forms of communication that promotes collective action. Focusing on collective actions is essential due to the growing evidence that highlights community participation is necessary to significantly reduce disaster risks, and it is now a priority in the National Resilience Strategy, 2019 (Ministry of Civil Defence & Emergency Management, 2019). It can be achieved either by targeting the socio-psychological factors that encourage collective action like sense of community, place attachment, collective efficacy, trust etc.; or by leveraging on a person’s communication ecosystem and social networks; or by empowering people through the design of policies and programmes informed

by people's lived experiences and worldviews, democratizing decision-making processes, addressing power differentials and ensuring equity and justice in emergency management processes.

While some international studies exist (Garvey & Paavola, 2022; McGee & Langer, 2019), communication research to promote collective actions is recognized as a gap in international literature as well (Bogdan et al., 2021; Jamshidi et al., 2016; Rogers et al., 2016). Burnside-Lawry et al. (2013, p. 32) note that "to build this area of research, there is a need to investigate a variety of community engagement methods" and identify "key communication strategies ... that assist constructive collective action". So, in this study I aimed at gaining a systematic understanding of how communication can be applied to foster awareness of collective risks, promote involvement in actions to address community concerns, and inspire collective collaborative efforts to improve preparedness – questions that have remained largely unanswered (Norris et al., 2008). This understanding is necessary to design policies and programmes that help "communities, and not simply individual households", to "collectively marshal resources", and build readiness for the next disaster (Uscher-Pines et al., 2013, p. S70).

Moreover, from the limited studies that exist, little guidance can be drawn to inform practice. Firstly, many of the studies are case studies conducted in countries which differ from New Zealand in terms of their hazard experiences, cultural and socio-political characteristics (Bogdan et al., 2021; Lejano et al., 2020; Samaddar et al., 2015). This makes it difficult to apply the findings in the New Zealand context to draw generalized conclusions and policy recommendations. Thus, a study grounded in the country's specific situation and characteristics is required. Secondly, researchers have experimented with various concepts, techniques and approaches derived from different guiding theories and a wide range of these strategies have been successful at achieving some engagement (Ryan et al., 2020). However, only a few of these techniques are adopted (or are possible to be adopted) by emergency management agencies and related organizations in practice, because of multiple operational constraints such as cost, resource intensiveness, scalability issues, sustainability concerns, etc. So, it is important to identify what can be adopted and sustained in regular practice, what should be avoided, and what operational challenges persist. This will help in refining, tailoring, and improving communication products to suit practical needs. Lastly, it is also important to examine how people engage with the current communication practices, how they interpret, process, and act on them and what the implications are upon people's actual participation in collective actions for preparedness. Understanding people's perspectives in relation to current practices is crucial to inform the process of communication design and make it more effective. This gap drives the second and third research questions:

RQ2. What communication practices are used to encourage civic participation and collective actions in disaster risk reduction?

RQ3. What are the effective approaches and considerations when encouraging civic participation and collective actions in disaster preparedness using communication?

2.4 Theoretical perspectives guiding the study

A theoretical perspective is derived from the concepts, terms, definitions, models and theories of a particular literature base and disciplinary orientation (Merriam, 1998). It helps in determining what to look for to make sense of the data. In qualitative case study research, as adopted in this study (Chapter

3), identifying a theoretical perspective at the outset of inquiry is important as it guides the research questions, analysis, and interpretation of findings (Yin, 2018).

The overarching question guiding this research is *“How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?”* It aims to understand two elements - the context (civic participation and collective action in disaster risk reduction in New Zealand) and the phenomena (communication practices) within the context.

To understand the context - civic participation and collective action in the pre-disaster stage in New Zealand - I draw from disaster studies literature on community engagement, participation, and collective action, with a particular focus on community-based disaster risk management (Luna, 2013; Shaw, 2012) and community resilience literature (Aldrich & Meyer, 2015). This body of work builds on concepts, models, and theories from political, social, and environmental participation, collective action and volunteering literature giving it a multidisciplinary character. As this part is descriptive in nature, I do not use a single guiding theory. Rather I draw on different theoretical and conceptual lenses presented in this review (section 2.2) to inform data analysis and interpretation of civic participation and collective action in the pre-disaster stage in New Zealand.

To understand the phenomena – communication practices – within the context, I draw on concepts, models and theories from risk communication (Covello et al., 1986; Tversky & Kahneman, 1974; Ajzen et al., 1985; Lindell & Perry, 2012), participatory communication (Huesca, 2008; Colle, 2008), and communication literature on disasters (Houston, Spialek, et al., 2015; Lejano et al., 2023). I refrain from using a pre-specified theoretical framework at the outset to avoid having to fit the data in a priori assumptions (Leeming, 2018). Instead, I engage with different theoretical and conceptual lenses (section 2.3) to frame the study. However, as the study proceeded, I gravitated towards communication ecology (Broad et al., 2013) and relational models of risk communication (Lejano et al., 2018; Lejano, Haque, and Berkes, 2021) as they provided a new lens to understand the communication practices, and eventually settled on the communication infrastructure theory (CIT) to guide the study (Kim and Ball-Rokeach, 2006). This is common in qualitative case study research where at the outset different theoretical lenses are considered and, as the study proceeds, they hold greater or lesser relevance in explaining the phenomenon (Cresswell, 2013). Given this is applied research, the emphasis was not on theory testing or generating new theoretical insights; rather I applied concepts from CIT to examine real-world communication practices and identify how communication outcomes can be improved. Thus, CIT served as a lens to interpret and understand the phenomena (Anfara Jr & Mertz, 2014). Communication infrastructure theory (CIT) adopts a communication perspective lens to explain how civic participation develops in neighbourhoods. Drawing on the idea of communication ecologies, it views a community’s communication system as a network of actors and resources through which people seek information and make decisions to carry out daily activities (Broad et al., 2013).

This communication system has two key components: (i) the neighbourhood storytelling network (NSN); and (ii) the communication action context (CAC). NSN includes macro-level (like mainstream media, focusing on broader city, national, or global narratives for a generalised audience), meso-level (concentrating on specific city sections or communities), or micro-level (family, friends, and neighbour networks) communicating actors. These actors generate and circulate stories about the neighbourhood and shapes everyday conversations in the neighbourhood. CAC consists of both

tangible and intangible resources (such as community meeting halls, local noticeboards, telecommunication networks, the mass media, and digital community platforms) and contextual factors (such as the local environment and shared histories) in the neighbourhood that enable communication among residents.

The storytelling actors and resources share neighbourhood stories and narratives. These stories reflect the aspirations, challenges, and lived experiences within the neighbourhood and create a shared sense of reality. This enables communities to relate to their neighbourhoods, build a common identity and sense of community, ultimately encouraging civic participation. According to CIT, the NSN is most effective in stimulating participation and collective action when its actors are well connected and the narratives they share highlight common neighbourhood concerns. The strength of CIT lies in its comprehensive view of communication, which integrates mass media, community organisations, interpersonal networks, and local resources and the interplay among them. CIT's focus on collective community action makes it particularly suitable for this study.

Chapterization

Guided by the CIT, the study reflects on three interrelated components - the context (CAC), the neighbourhood storytelling network (NSN) and the narratives (neighbourhood stories). Chapter 4 describes civic participation and collective action in the pre-disaster stage in New Zealand, thereby contributing to our understanding of the broader context (CAC). Chapter 5 focuses on the communication practices and outlines the communication networks and infrastructure, further developing our understanding of the CAC and the NSN. Chapter 6 examines the narratives (neighbourhood stories) that flow within the NSN and promote civic participation and collective action. Lastly, Chapter 7 studies an emerging form of communication infrastructure and illustrates how newer forms of NSN and CAC promote civic participation and collective action in disaster preparedness. In the discussion chapter (Chapter 8), I summarize the findings from previous chapters and situate them within the broader disaster literature. I articulate the newer understanding of communication practices, particularly relational communication approaches, derived through this study and outline how they can be best used to support civic participation and collective action for disaster risk reduction in New Zealand.

2.5 Chapter summary

This chapter has defined key concepts related to civic participation and communication in disaster risk reduction (DRR), reviewed existing literature, identified the research gaps and presented the theoretical perspectives guiding this study. The next chapter discusses the overarching philosophical approach guiding the study and the research methods adopted to conduct the research.

Chapter guide

Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.		What are we studying?
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study		How are we studying it?
Chapter 4 Civic participation & collective action	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Existing communication practices	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Communication content	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Emerging areas of communication	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Chapter 3 Research Design

This chapter provides an overview of the research design, beginning with an outline of the research paradigm and rationale for adopting a pragmatic approach to guide this study. Subsequently, the methodology section delves into the research approach and explains the sequential mixed methods approach adopted to conduct the study and outlines the data collection and analysis techniques.

3.1 Introduction

The research design outlines the plan of conducting research. It describes the philosophical assumptions that the researchers bring to the study (research paradigm), the strategy of inquiry (methodologies), and the methods that will be used to conduct the research (data collection and analysis) (Creswell, 2009). The research design for this study is presented below. First, I reflect on the research problem and the ontological, epistemological, and axiological position of the study. Then, I discuss the methodology and methods used to conduct the study. I conclude with a discussion on the quality standards adopted and ethical considerations in the study.

3.2 Research paradigm

The choice of research paradigm guides researchers on what research questions are valuable and what research methods are most useful in obtaining the desired results (Morgan, 2014a).

3.2.1 Realist and relativist ontology

Ontology attempts to answer the question of *what reality is*. It deals with the researchers' assumptions and beliefs about reality, particularly the reality of the phenomenon which is being studied (Niiniluoto, 2002).

Realist ontology claims that there exists a world which is real, with which I interact, to which our theories refer to and it will exist irrespective of whether I know about it or not (Niiniluoto, 2002). Relativist ontology argues that the social world is a construction of mind (Creswell & Clark, 2017). In this, reality is co-constructed through meaning making by social actors, that is, worldviews are formed through subjective views - there is no mind independent external reality which exists in the social world (Lincoln et al., 2011).

The phenomenon being studied here is civic participation and collective action¹¹ for disaster preparedness and the communication around it. I contend that natural hazards and their impacts on the world are real. Though collective action, civic participation and communication are social constructs, when they help in reducing the impacts of natural hazards, they have consequences in the real world. They are not solely mental constructs - they have a mind-independent existence, which I can attempt to understand, albeit imperfectly. Hence, I will adopt a realist ontology for this study. Ontological realism aligns well with disaster studies (Arroyo & Åstrand, 2019; Ceusters et al., 2008).

¹¹ Refers to efforts that people take collectively prepared for hazards. e.g. In wildfire prone areas, landowners might collaborate to reduce flammable vegetation in their properties, organize controlled burns, etc.

3.2.2 Epistemology and research paradigm

Epistemology explores the nature of knowledge and attempts to answer the question of what is possible for us to know and how I can know it (Maxwell, 2012). Deriving from our ontological beliefs, the dualistic view on knowledge argues that reality is either:

- single, tangible, and independent from the knower, and thus the knower can objectively know the truth using empirical approaches (objectivism); or,
- multiple, socially constructed, and subject to the interpretations of the knower, thus it can never be objective (constructivism) (Creswell & Clark, 2017).

Grounding knowledge on the dualistic idea of reality implies that only certain forms of knowledge can be acquired using specific methods based on the assumption of reality (Teddlie & Tashakkori, 2009a). Drawing on this premise, five main research paradigms exist in social sciences which are described below along with their ontological and epistemological positions and the associated research approaches (Table 3.1).

Based on the ontological and epistemological dichotomy, the first two research paradigms are positivism, and interpretivism. **Positivism** follows a realist ontology and an objectivist epistemology. It argues that there is a single reality independent of the knower. As the reality has a mind independent existence, it is possible to objectively observe and verify the truth using suitable methods. Thus, in the positivist paradigm researchers conduct research objectively without being influenced by their biases to understand the reality (Bryman, 2006). Research methodology utilized by positivist researchers is typically quantitative in nature. Though qualitative and mixed methods are also observed. Positivist research generally involves hypothesis testing to identify causal relations. The research approaches include experiments, controlled trials, quasi experimental designs, etc. It involves quantifying variables, testing, confirming, or falsifying the hypothesis, and deriving theories that can be generalized for the population (Tashakkori & Creswell, 2008). Theory building is thus deductive in nature. The data collection is often done through structured observations, surveys, or closed interviews, etc. The research participants are mostly selected through probability samples like random samples, stratified random samples, etc.

Interpretivism follows a relativist ontology and constructivist epistemology. It argues that the social world does not have a mind independent existence. The reality is socially constructed by social actors and influenced by their worldviews, cultures, and biases. Here, the researcher does not aim to uncover the truth as there is no single reality to be understood. Rather the researcher engages with the research participants and knowledge is generated through the interactions and interpretations in this process (Creswell, 2007). The interpretive researcher acknowledges the presence of multiple realities where knowledge is subjective. The research methodology for interpretive researchers is generally qualitative though there are uses of quantitative methodologies as well. The research approaches include case study, ethnography, grounded theory, phenomenology, etc. All these approaches require interactions with the research participants to generate rich description and document multiple perspectives. The researcher is expected to be reflexive and understand how the researchers' positionality is likely to influence the research. The process of theory building is inductive in nature, which means there is generally no a-priori theory, rather theory is built from data (Tashakkori et al., 1998). The findings are expected to generate deep insights but are not expected to be generalizable to

the population. Data collection is often done through open ended interviews, focus group discussions and other processes. Analysis of data relies heavily on interpretations and sensemaking.

This research studies natural hazards, which have a mind independent presence in the real world. It also studies civic participation, collective action, and communication which draws on people's experiences and subjective interpretations that consider multiple realities. As a result, the research could not rely solely on one approach - either a purely objective view or a constructivist view - because both were needed to understand the topic.

Critical realism believes that there is an external reality independent of our minds. However, the knower is always influenced by social, political, historical, cultural, economic, and other contexts, and these influence their interpretations, hence, knowledge is a human construct. Thus, it distinguishes between the ontological and epistemological positions and follows a realist ontology and a constructivist epistemology. Critical realists aim at understanding the complex, often invisible layers at play in the real world (Bhaskar et al., 1998). They consider that reality is stratified between real (mechanisms, entities and structures that cause events), actual (the effects and their effects caused by causal mechanisms) and empirical (the effects that are measured, experienced or observed) (Haigh et al., 2019). To understand any phenomenon and theorize them, there is a need to distinguish between the layers of reality. Critical realists, thus, employ both qualitative and quantitative approaches to understand the layered nature of reality. The emphasis is to adopt a research design that helps to understand underlying structures and mechanisms that cause observable phenomena and the causal mechanisms at play. The objective of this study was not solely to uncover the underlying causal mechanisms, rather it also explores and describes existing practices as observed. Thus, critical realism did not align perfectly with the goals of this study.

Critical theory is suitable for research that contains an action agenda that will transform the lives of the marginalized (Creswell, 2007). Critical theory researchers follow a relativist ontology and a constructivist epistemology. Their emphasis is to understand the world through the lens of power dynamics, reflect on the power imbalances and identify ways to act on their action agenda. Issues of oppression, hegemony, domination, suppression, and forms of marginalization are studied and exposed (Mertens, 2008). The researcher is aware of the socio-cultural context and the power dynamics. There is flexibility with the choice of research methodologies, however, the commonly used methodology is qualitative. The research methods are participatory in nature, involving active engagement and interactions with the research participants. The participants are considered as collaborators in the research, and the objective of the researcher is to give them a voice. Through this process the researchers aim at influencing the discourse and political debate to bring change in the lives of the marginalized. This research engages both marginalized and mainstream groups and is not focused solely on marginalized voices. Thus, critical theory did not fit the study.

Pragmatism embraces both realist-objectivist and relativist-constructivist philosophical positions. It recognizes that the metaphysical debate over whether there is one reality, or many, cannot be definitively resolved (Morgan, 2014b). Rather, pragmatists value both objectivist (certain universal factors exist which govern our experiences in the world) and constructivist (all our experiences are shaped by our interpretations) positions and consider that "different knowledges are simply the result of different ways in which I engage with the world" (Biesta, 2010, p. 113). It endorses methodological pluralism and considers even conflicting theories are useful to different degrees in how well they help

us understand the world. The pluralistic nature of the pragmatic paradigm allows researchers the flexibility to employ both qualitative and quantitative methods to identify the best solutions to the practical problem. The research methods are selected based on their suitability to provide answers. The approach to theory building can be inductive, deductive, or both. Pragmatists reorient the starting point of research (Morgan, 2014b) and consider that inquiry to gain knowledge starts from the recognition of a real-life situation as problematic, and attempts to find answers to address the practical problem (Kaushik & Walsh, 2019). For pragmatists, knowledge is generated through the actions taken to solve the problematic situation by interacting with the world (Goldkuhl, 2012). Knowing is “concerned with grasping the relationship between our actions and their consequences”, and it is only by interacting with the world that people can gain knowledge, “reshape their environment and improve the quality of their lives” (Biesta, 2010, p. 106). This implies that knowledge is always based on experiences, it is not absolute, rather it is constructed to better manage our existence in the world (Goldkuhl, 2012). Pragmatists are free to choose any version of reality, there is no quest for the truth. Pragmatists argue that while it can never be confirmed whether our understanding is about the actual world or not, certain beliefs are more likely than others to address the problematic situation, and such beliefs are acceptable beliefs (Morgan, 2014b). Truth is not the ultimate statement about the world which will end all inquiries, rather truth is a reliable resource that aids in further inquiry - truth is what works.

The research question guiding this study is: *“How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?”*

I arrive at the research questions with the recognition that a gap exists in our knowledge and that there is a practical problem that should be addressed. I aim to investigate my research question using methods that are best suited to provide adequate answers (Bryman, 2006). For this research I define my ontology in section 3.1 as realism, however, I intend to employ both objectivist and subjectivist lenses to investigate the research questions and reflect on my findings acknowledging my own worldviews and biases to arrive at the acceptable beliefs. These align with the central tenets of pragmatism and hence this research will be guided by pragmatism.

This research will draw mainly from disaster studies and will engage loosely with communication, psychology, sociology, and environmental research. It will be interdisciplinary in nature as “complex qualities of hazards and disasters necessitate interdisciplinary approaches to inform theory development” (Sherman-Morris et al., 2021, p. 1059). Interdisciplinary research often draws from various disciplinary frames of reference which may hold opposing metaphysical positions. An appreciation of the different worldviews may be helpful, if not necessary, in gaining a complete understanding of the research question. Beck (2000, p. 2) states, for understanding “the complex and ambivalent nature of risk in the world”, “the decision whether to take a realist or a constructivist approach is for me a rather pragmatic one, a matter of choosing the appropriate means for a desired goal”. Studies by Huffman (2018), DeMarrais and Earle (2017), Gowan (2011) and other scholars show that research within disasters, communications, as well as collective action domains, can be guided by a pragmatic lens.

	Positivism	Interpretivism	Critical Realism	Critical Theory	Pragmatism
Ontology	Realism – existence of a single reality	Relativism – existence of multiple realities co-constructed by social actors	Realism – existence of a single reality	Relativism – existence of multiple realities co-constructed by social actors	Aligns with both realism and relativism
Epistemology	Objectivist – knowledge is gained objectively through measuring, observing, and experiencing the real world, knowledge is considered value free	Constructivism – knowledge is socially constructed, and subject to the interpretations of the knower, thus it can never be objective	Constructivism – knowledge is socially constructed, and subjective	Constructivism – knowledge is socially constructed with an emphasis on understanding the power dynamics and dismantling the status quo	Knowledge is gained through actions
Research approach	The researcher objectively uncovers the truth using empirical approaches, Experimental or quasi experimental design, quantitative methodologies, deductive in nature, involves hypothesis testing, generalizable findings	The researcher engages with the research participants to understand the multiple realities through interpretations and sensemaking, typically qualitative methodologies, involves discussions with the participants, Interpretative in nature, Inductive theory building	Employs both qualitative and quantitative methods depending on their suitability to answer the research questions. The emphasis is to understand the causal mechanisms at play.	Aims to produce knowledge which is emancipatory. The emphasis is on amplifying the voices of the marginalized. Typically utilizes qualitative and participatory approaches. Interpretative in nature	Employs both qualitative and quantitative methods depending on their suitability to answer the research questions
Examples of research methods	Experiments, hypothesis testing using survey data, quantitative content analysis	Semi-structured interviews, focus group discussions, observations	Uses research methods most suitable to understand observable phenomena as well as deeper unobservable mechanisms. Both qualitative and quantitative methods.	Uses research methods most suitable to capture marginalized voices. Generally, uses on qualitative methods and participatory approaches.	Uses research methods most suitable to answer research questions. Both qualitative and quantitative methods.

Table 3.1 - Summary of research paradigm

3.2.3 Axiological considerations

Axiology refers to the question of value and answers *what is the role of values in the research* (Onwuegbuzie & Johnson, 2021). Pragmatism recognizes that researchers' personal value systems influence the topic of research as well as the way in which research is conducted (Weaver, 2018). This includes, but is not limited to, methodological choices, types of data collected, units of analysis, interpretation of findings, etc. (Tashakkori et al., 2020). For pragmatists, inquiry is not value free and research "is carried out within the value system of the investigators involved and is based on answering research questions of interest to the investigators" (Tashakkori, 2020, p. 91). Pragmatists argue that researchers' values and experiences influence their search of descriptions, theories, explanations, and narratives from the outset of a research (Cherryholmes, 1992). Thus, research begins from a researcher's belief that something is unknown, and knowing it is necessary to make desired changes in the environment. Based on that, pragmatic researchers decide what research to do, and how to do it.

Some scholars have raised concerns that the pragmatist emphasis on '*what works?*' might ignore the bigger question of '*what works for whom?*', as raised by social justice scholars (Denzin, 2010). A short answer to this is that the '*whom*' can be anyone who is concerned with the same concerns as the researcher (Maarouf, 2019). However, the above question also arises from the apprehension that pragmatic research might devalue questions of politics and power in its aim to find '*what works*'. While I agree to a certain extent with this concern, following Morgan, I argue that by allowing "individuals", who belong to social communities, to "define the issues that matter most to them and pursue those issues in the ways that are the most meaningful to them", pragmatism respects individual agency (Morgan, 2014b, p. 6). It allows freedom of inquiry to anyone and everyone to address their concerns and find what works for them. The tenet of pragmatism to reject beliefs that are not working and find new beliefs, in itself, relates to changing the environment to better align with the aims of social justice.

Summary

To sum up, this research follows a realist ontology and a pragmatist epistemology. The next section discusses the methodology of the study.

3.3 Research Methodology

Research methodology guides the overarching research design and serves as a link between the research philosophy and the research methods (Filstead, 1979). It encompasses the research approach (qualitative, quantitative etc.), research strategies (case study, experimental design etc.), research methods which include data collection (interview, survey etc.) and analysis techniques (thematic analysis, multivariate analysis etc.), and the logic behind the selection of them (Kothari, 2004; Taylor et al., 2006).

3.3.1 Exploratory sequential mixed methods design

A mixed methodology was utilized to conduct the study. Mixed methodology studies employ both qualitative and quantitative approaches in a single study (Tashakkori et al., 1998). It offers the flexibility to study the same research problem using multiple lenses and different theoretical perspectives, playing on the strengths of both qualitative and quantitative approaches (Morse, 2010). It aligns well

with a pragmatic paradigm that values both objectivist and interpretivist positions (Morgan, 2007). Such methodological pluralism “frequently results in superior research” than solely quantitative or qualitative studies (Johnson & Onwuegbuzie, 2004, p. 14). Additionally, mixed methodology is ideal for practical bottom-up research undertaken to meet the “pragmatic needs of researchers and evaluators in various fields” (Tashakkori & Creswell, 2008, p. 3).

The intent for collecting the qualitative and quantitative data determines which mixed methods design should be used (Creswell & Plano Clark, 2018). The aim of this research was to explore collective actions, civic participation and communication for disaster preparedness in New Zealand. These are abstract concepts on which little is known. The variables were unclear at the start of the study. Answering the question required a holistic understanding of the context and examining the phenomenon of civic participation and collective action in disaster preparedness and communication from different disciplinary and theoretical lenses. It required an initial in-depth exploration of the research problem using qualitative approaches before gathering quantitative data. Hence, an exploratory sequential design was deemed appropriate as it is helpful when little is known about the phenomenon and the researcher is interested in gaining an initial understanding before thorough quantitative assessments can be made (Clark & Creswell, 2008). I avoided explanatory sequential design or convergent design as little was known about the phenomenon and identifying variables and conducting quantitative assessments would not have been possible without understanding the phenomenon first. Also, the qualitative orientation of the researcher suited the exploratory sequential design (Creswell, 2014).

Because of the exploratory nature of the research problem, the design had major qualitative components and minor quantitative components (QUAL->quan) (Plano Clark et al., 2008). The research strategy is outlined below. In the initial stage, the researcher used qualitative techniques to study to understand collective action, civic participation and communication. In the later stage, a survey was designed and administered. Inferences were drawn by comparing the qualitative and quantitative data.

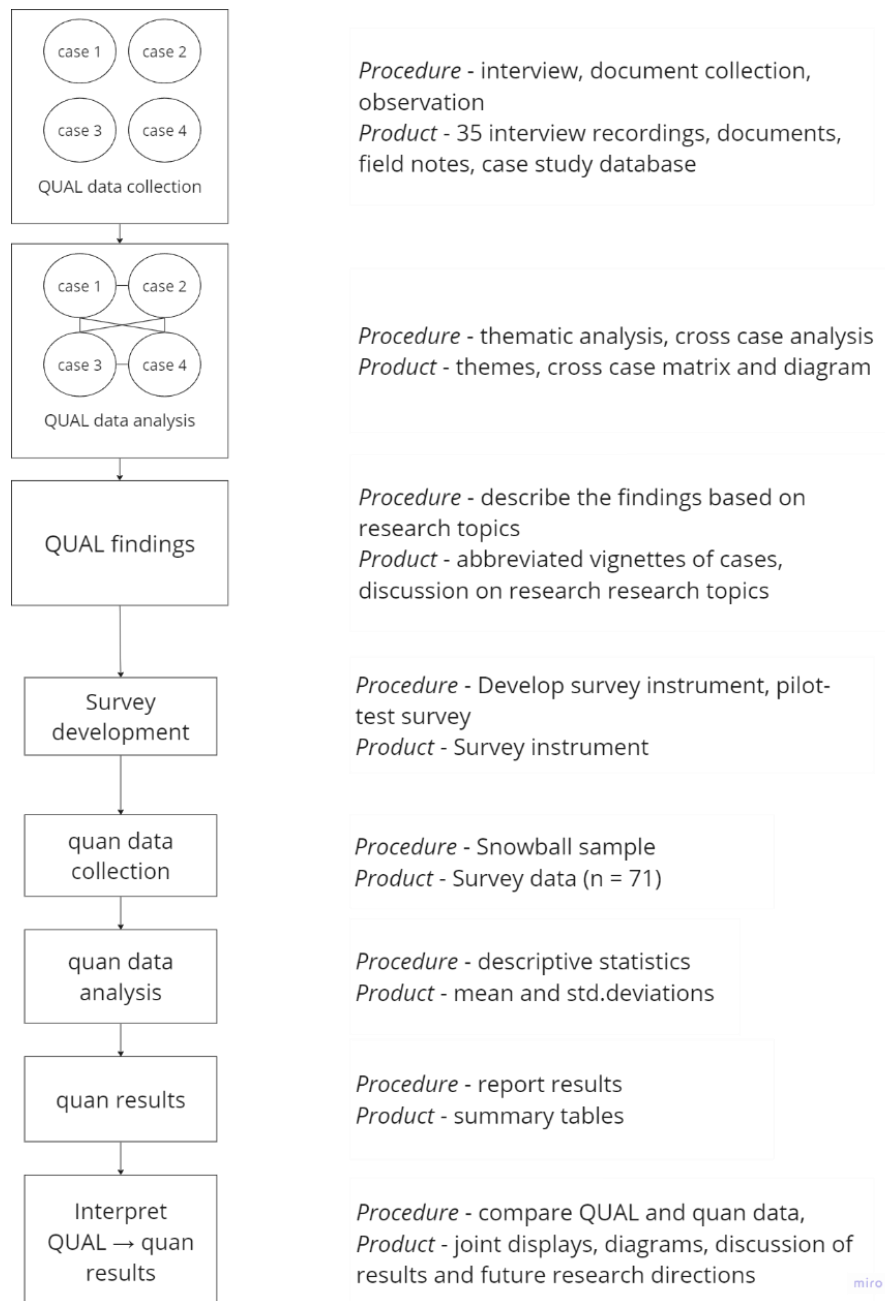


Figure 3.1 – Diagram of the exploratory sequential mixed methods design followed in this research. Adapted from Clark and Creswell (2008)

3.3.2 Qualitative case study

Qualitative research is conducted following five main approaches – phenomenology, narrative research, grounded theory, ethnography, and case study (Creswell & Poth, 2016).

A case study approach was adopted for this study (Table 3.2). Case study involves in-depth exploration of single or multiple cases embedded within their real-life context, where cases can be events, programmes, an activity, or people (Stake, 1995). I selected case study because it is suitable in investigating: i) contemporary phenomena in depth within its real world context, ii) exploring the contextual influences and complex interconnections, and iii) helpful to study a phenomena where the

boundary of the phenomena and the context is not well defined (Crowe et al., 2011; Guetterman & Fetters, 2018; Stake, 1995; Yin, 2018).

Type	Characteristics	Suitability
Narrative	Delves into the life of a person(s), with a focus on narrating their stories or experiences (Creswell, 2007).	Considering the research objective of studying the phenomenon of collective action and related communication practices in New Zealand, narrative research, phenomenology, and ethnography were not suitable for this research.
Phenomenology	Grasps the nature of human experiences, and is well-suited for research aiming to understand the essence of lived experiences (Giorgi & Giorgi, 2003).	
Ethnography	Used to study groups that share a common culture and understand and interpret the collective cultural patterns within a group (Atkinson, 2007).	
Grounded theory	Suitable to study processes, actions, or interactions involving many individuals and systematically develop a theory grounded in the data collected from the participants (Charmaz, 2008).	Suitable for the study. However, I did not have an explicit aim of abstracting the findings into constructs to develop a theory from ground (Glaser & Strauss, 2017) and hence preferred case study over grounded theory.
Case study	Utilized for in-depth exploration of the topic of interest embedded within its real-life context (Stake, 1995).	Suitable for the study

Table 3.2 – Qualitative research designs, their characteristics, and a brief description of my evaluation of their suitability.

Due to the exploratory nature of this research, I follow the constructivist approach to case study design that recommends a flexible approach (refer Stake (1995) for more). This selection was due to the hitherto unknown character of the study which made it difficult to have more structure at the beginning. Also, instead of having theoretical propositions as suggested by Yin (2018), I used a theoretical perspective derived from the literature review (Chapter 2) to guide the study (Merriam, 1998).

Two important elements in any case study research are a bounded system (case) and a complex phenomenon to be studied (or quintain) (Stake, 1995). The case refers to a system or systems that are analysed to understand the quintain (Crowe et al., 2011; Harrison et al., 2017). By systematically studying the cases in their real-life settings, I understand the quintain and grasp its specific conditions and characteristics (Stake, 2013). Thus, an integral step of conducting case study research is identifying the cases, defining the boundary of the case, and selecting appropriate cases(s) that help us in understanding the quintain better. Typically, cases are either intrinsic, i.e. the case itself is of interest, or instrumental, i.e. the case facilitates the understanding of the quintain. After case identification, a single case or multiple cases can be selected for exploration. Studying multiple cases is considered

more robust for generalizability of the findings (Borman et al., 2012). I adopted a multiple case design with instrumental cases to examine the quintain in different settings.

Multiple methods and analysis techniques are applied in case study research to gain a comprehensive understanding of the quintain. The suggested data collection and analysis methods vary. Yin (2009) suggests the use of both quantitative techniques like surveys and qualitative techniques like interviews, observations etc., while Stake suggests the use of qualitative techniques (Yazan, 2015). I follow the latter in this study as that suited the research objectives better. I conducted interviews, observations, and collected documents and utilized thematic and cross case analysis for drawing inferences (refer section 2.2.3 and 2.2.4).

Case selection

In purposeful case selection strategy, the cases are selected based on predefined criteria relevant to the research objectives. This approach aims to explore the phenomenon in different environments and find commonalities and contrasts across them. For example, selecting cases that offer different perspectives on the phenomenon (Creswell, 2007), or selecting cases with diverse contexts to learn about the complexity of the phenomenon in the different contexts (Stake, 2013). Alternatively, a replication logic which is guided by theoretical propositions can be followed (Yin, 2009), i.e. selecting cases that are similar to see if the theoretical propositions hold in them (literal replication), or selecting cases that differ because of reasons that are predictable using the theory (theoretical replication). Sometimes the cases can be identified beforehand by a third party, like the funders (Stake, 2013). For my research, the cases were not selected apriori, and I could not find existing theories to guide the replication logic, so I followed the first approach to case selection.

Groups involved in collective actions on disaster preparedness were chosen as cases to be studied (Mills et al., 2009b). The boundary conditions were: i) the groups should be led by community members; ii) should be operational at the community or town level, and not regional or larger scales; and iii) currently operational in the study areas.

To select cases, a two-step process was followed. First, historical disaster data from EM-DAT¹² and the Insurance Council of New Zealand were reviewed to identify regions most affected by disasters. Also, hazard profiles of each region were examined to identify areas prone to multiple hazards. Consequently, eight regions were chosen - four in the North Island (Hawke's Bay, Bay of Plenty, Wellington, Auckland), and four in the South Island (Canterbury, Southland, Otago, West Coast).

In the second step, online meeting requests were sent to emergency management practitioners, community leaders, and academics in these regions to discuss their emergency management approach, community engagement processes, communication practices, collective initiatives (if any), and the feasibility of conducting the study. Based on the data gathered, and the researcher's ability to gain access and build rapport with participants (Creswell & Miller, 2000), I selected four groups for in-depth exploration - one resident's association (in Mt Cook in the Wellington region), and three community response teams (Edgecumbe Community Emergency Response Team, in the Bay of Plenty;

¹² A comprehensive global database that tracks and compiles data on natural and technological disasters managed by the Centre for Research on the Epidemiology of Disasters (CRED)

Arthur’s Pass Community Response Team, in the Canterbury region, and Gore Community Response Team in the Southland region). I took four cases as it helps in gaining robust insights through cross case analysis (Yin, 2009) and is also feasible within the PhD timeframe (Schoch, 2020). I selected these groups because they function in areas exposed to diverse hazards to varying degrees, differ in their hazard experience, and operate in different geographical and social settings. The four cases were studied in parallel.



Figure 3.2 – Map showing the study locations



Figure 3.3 – Photos taken at study locations (A – Edgcombe, B – Mt Cook, Wellington, C – Arthur’s Pass, D - Gore)

3.3.2.1 Data collection

3.3.2.1.1 Interview

Interviews are a qualitative data collection method used to gain deep insights on a little-known phenomenon (Gill et al., 2008). Semi structured interviews are a form of interview where a consistent set of questions are asked across interviews; however, there is flexibility to the interviewer to pursue a particular response in more detail when previously unknown or unthought of information emerges, and to explore deeper lines of inquiry (Creswell, 2007). They are effective to understand experiences, and perspectives of people.

Initially, ten scoping interviews were conducted with disaster management practitioners (n=5), community leaders (n=3), and academics (n=2), to understand the collective initiatives and communication practices in the regions. These interviews helped in understanding the feasibility of the study, establishing contact with community members, building rapport, and gauging the interest of the participants in the study. Three of the interviews were also used as pilot interviews to test the interview guide and make necessary changes before starting data collection.

Criterion sampling was applied to identify interview participants (Palinkas et al., 2015b). Emergency management officials, representatives from non-governmental agencies, and information-rich community members who fulfilled the following criteria: a) working with communities in the case study regions, and b) engaging in DRR and preparedness communication, were recruited for interviews. Interviews were also held with the leaders of the case study groups, and volunteers who fulfilled the following criteria: i) is an active member of the group for more than six months, and ii) is information-rich and knowledgeable. This sampling strategy was used as it is suitable to identify information rich participants who can also provide a comprehensive understanding of the phenomenon of interest (Palinkas et al., 2015b).

Thirty-five (35) virtual interviews of 1 to 1.5 hours were conducted between February 2022 and September 2023 with officials from civil defence emergency management agencies, non-governmental agency representatives and community leaders, and volunteers (Table 3.3). Additionally, three follow-up interviews were carried out to address ambiguities identified during preliminary data analysis. The interview guide contained open ended questions exploring the preparedness initiatives, motivations, and communication (Appendix 3 for interview guide). Thirty-three (33) of the 35 interviews were audio recorded with permission of the participants. Two participants denied being recorded, and manual notes were taken for them.

Interviews participants			
<i>Area</i>	<i>Profile</i>	<i>No. of participants</i>	<i>Code</i>
Bay of Plenty	Volunteer in community emergency response team	4	BoP_V1 to BoP_V4
	Emergency management (CDEM) official	1	BoP_EM1
	Official from district council	2	BoP_EM2 & BoP_EM3

	NGO personnel assisting in emergency management	2	BoP_N1 & BoP_N2
Wellington	Volunteer in community group working on emergency management	5	W_V1 to W_V5
	Emergency management (CDEM) official	4	W_EM1 to W_EM4
Canterbury	Volunteer in community emergency response team	8	C_V1 to C_V8
	Emergency management (CDEM) official	1	C_EM1
	Official from district council	1	C_EM2
Southland	Volunteer in community emergency response team	6	S_V1 to S_V6
	Emergency management (CDEM) official	1	S_EM1
	Total		35

Table 3.3 - Participant profiles for each area, number of participants for that profile, and assigned code identifiers.

3.3.2.1.2 Observations

Observations involve the systematic process of gathering data by watching and recording events, behaviours, or phenomena as they naturally occur in their environment (Lopez & Whitehead, 2013). Non-participant observations, a type of observation, involves the researcher observing the phenomenon under study but refraining from active participation in the activities to minimize the impact of the observer's presence on the natural flow of the observed context (Patton, 2014).

I conducted field visits to the three study areas between May 2023 and September 2023. Field notes (Ostrower, 1998) were maintained documenting observations, interactions, and unexpected occurrences, contextual information, and personal reflections.

During the field visits, I observed that communication on collective actions primarily happens through in person communication (meetings, workshops, one on one conversations, etc.). So, I participated as a non-participant observer in six community meetings related to preparedness - community emergency hub training (1), group meetings (4), and an annual training night (1). During these events, I observed interactions in social settings. I also had opportunities to interact with the many participants informally at the events. Rough notes were taken during the events and detailed field notes were written after returning from events, based on my experience of what happened.

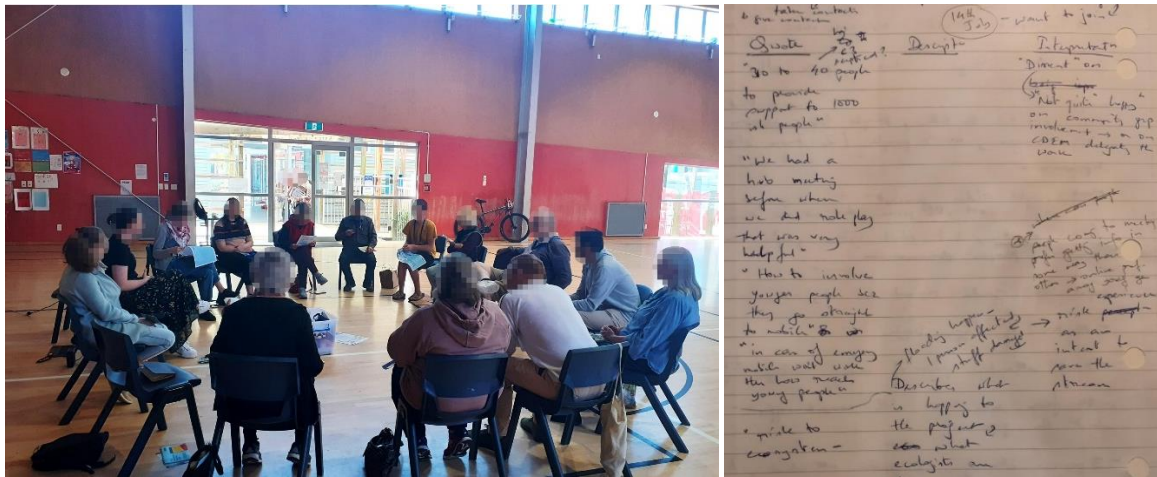


Figure 3.4 – Community meeting at Mt Cook (left) and field notes (right)

3.3.2.1.3 Document collection

Documents analysis is the systematic procedure of reviewing and analysing documents which are pre-existing and not generated for the purpose of the study but hold valuable insights that can help the researcher in understanding the phenomenon under study (Bowen, 2009). Such documents can be texts, images, videos, or other forms of artefacts in print or electronic form obtained from documents, books, articles, proceedings, recordings, mass media, etc (Tight, 2019). It is often used as a complimentary approach in addition to other research methods for triangulation (Morgan, 2022).

Posters, pamphlets, newsletters and other communication materials used by emergency management practitioners, CBOs, and NGOs to encourage collective preparedness in the study areas were collected. These included materials shared during public events, found in community places like libraries, cafés, shopping centres, etc., and promotional materials that the officials shared with me during field visits. Content about community preparedness, collective action, and community resilience in the commonly referred public facing websites (such as Wellington Region Emergency Management Office, Emergency Management Southland, Emergency Management Bay of Plenty, Civil Defence Emergency Management Canterbury and Selwyn district council) were also identified and noted in a word document. Content related to preparedness shared in social media of the abovementioned organizations and the community groups under study (e.g. Selwyn Community Response Team) between October 2022 and September 2023 were also read for content related to collective preparedness, and relevant content noted in a word document.

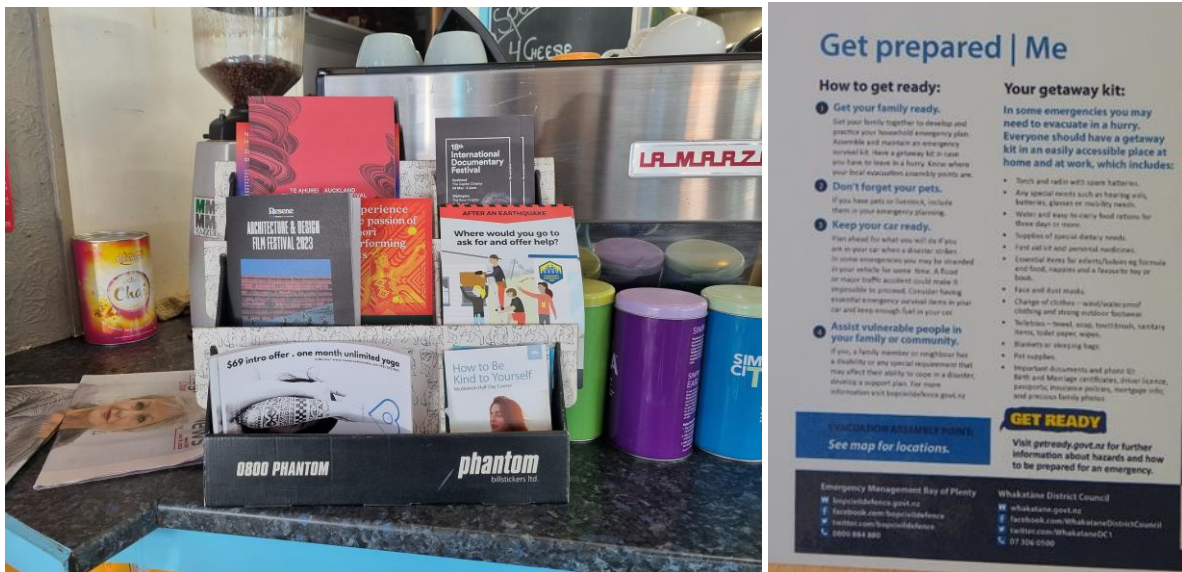


Figure 3.5 – Photos showing communication materials and related documents. Pamphlet on community emergency hub in a coffee shop in Wellington (left) and community guide to emergencies shared by the community emergency response team in Edgecumbe (right)

3.3.2.2 Data analysis

After a review of multiple approaches (Stake, 1995; Yazan, 2015; Yin, 2018), I selected thematic analysis (Braun & Clarke, 2012) and cross case analysis (Bazeley, 2020; Miles et al., 2014; Yin, 2018) for analysing the qualitative data.

Thematic analysis was used because it offers theoretical flexibility allowing both theory and data driven coding (Fereday & Muir-Cochrane, 2006). It is suitable for different forms of datasets and a valuable starting point for new researchers conducting multi-disciplinary research (Lester et al., 2020). It aligns well with a multiple case study approach (Fearon et al., 2021; Henderson et al., 2023).

Cross case analysis helps in obtaining better explanations for the phenomenon being studied. By looking at the similarities and differences across the cases, it helps in identifying underlying processes or factors that might not be observable in other techniques (Miles et al., 2014). It also enhances the transferability of the findings to other similar settings and is particularly recommended for multiple case study design (Yin, 2018).

3.3.2.2.1 Preparing for data analysis

As data collection started, the data was converted into suitable formats, e.g. audio recordings of interviews were transcribed, documents were scanned, and field notes were digitized. The organized data was then loaded in Nvivo, with cases assigned as Wellington, Bay of Plenty, Canterbury, and Southland. Relevant data and any accompanying analytic memos with each case were stored appropriately.

Analytic memos

Analytic memos are written to capture ideas, assumptions, and interpretations (Lester et al., 2020). Analytic memoing as a technique is associated with grounded theory research, but it can be utilized in any form of qualitative analysis (Herzog et al., 2019). Memos play a crucial role in maintaining

reflexivity throughout the study, aiding in the clarification of thoughts, offering critical reflections on the data, and preserving the decision-trail (Birks et al., 2008). In this study, I used analytic memos to determine the direction of the study, fine tune the research questions, identify the lens for analysis, critically reflect on the themes, and to guide my voice during writing. The memos were written as and when something thought-provoking happened. The memos documented what happened and how that will influence the research.

For example, the memo written on 15th Nov 2022 (presented below), prompted discussions on whether to study communities of identity, or geographic communities in this study.

20221115_R_Mainstream vs marginalized groups – RQ on communication do not fit

Interview of W_EM3 and also drawing on previous informal discussions - though I planned on doing a bi-cultural study based on communities of identity, from the preliminary interviews and discussions, it seems communication approaches to engage with “non-mainstream” groups is one step backwards. While some mobilization is happening with mainstream groups, marginalized groups seem far behind. It seems the lack of preparedness/engagement is more because of a lack of resources than for communication. It might be good to reflect on what is happening in this space as a contrast to the engagement with mainstream communities and look for why communication remains one step back. As I have substantial data now on how CDEM is engaging with specific groups across the country, I can discuss that in one chapter and then move to engagement with specific groups in the next chapter to draw contrasts. But I feel my methods and even the research questions won't be appropriate for these groups. What is better suited? Need to think on that.

Further discussions within the research team and with officials and academics eventually led me to shift from the initially conceptualized bicultural comparative case study of communities of identities to a multiple case study comparing different geographic communities.

3.3.2.2.2 Thematic analysis

Thematic analysis was conducted following the six phases suggested by Braun and Clarke (2012) – i) familiarization with the data, ii) generating initial codes, iii) searching for themes, iv) reviewing potential themes, v) defining and naming themes, and vi) producing the report.

i) Familiarization with the data - Following the first step, all transcripts were read analytically reflecting on the apparent and underlying meanings. Analytic memos noting ideas, interesting anecdotes, and parallels with theoretical concepts, were recorded. For example, a snippet from the memo written after watching the interview and reading the transcript of BoP_EM2 is below:

20220310_BoP_EM2_linking perceived responsibility to group-based injustice

“what motivated me was seeing that the community, living there and seeing that the community was in a decline process. So, I was still living here bringing up my young family and loved the town and declining was not an option, so I had to do something ourselves.” – I was thinking of sections that signify I should do it/have to do it ourselves/stepping up to do something on their own as perceived responsibility, which I mainly understood as altruistic, relating to internal standards and values.

But the above statement seems to show a sense of deprivation that the interviewee felt and took the responsibility to address the issue. I think this links to external circumstances making people feel responsible, even though they are not obligated or compelled. From the collective action literature on causal factors, I think this aligns closely with sense of group-based injustice. Will need to explore this further. It might be good to code perceived responsibility in two ways to capture this (can merge later if not significant).

ii) Generating initial codes - In the second stage, the initial codes were generated. Codes are short words or phrases that assign a comprehensive, distinctive, or evocative label to the data (Miles et al., 2014). The codes help in understanding the meaning of the data and answering the research questions (Braun & Clarke, 2012). I mainly used structural, concept, process, and in-vivo codes (Saldaña, 2021).

Structural codes assign a conceptual phrase relevant to the research question to corresponding section of data. Based on the research objectives, all transcripts were coded using structural codes. For example, sections relating to the content of messages or stories shared by communicating actors were coded as *message*. This was repeated for all interviews.

Once the structural coding was completed, sections having the same code, e.g. *message* were coded using concept, process, and in-vivo codes. Concept codes use a word that is more interpretative, drawn from literature. In-vivo codes use snippets from the participant’s own language as codes. Process codes describe an action. Some sections had both in-vivo/process codes and concept codes. Figure 3.7 shows the coding for part of the interview transcript of C_EM1.

The coding process was iterative with some codes reframed, discarded, or subsumed into another. For example, the codes *‘know your neighbour’*, *‘build a support network’*, *‘know each other’* were replaced by the code *Building community*. The code Gradual process seemed to connect with codes on Audience segmentation that were noted in another transcript. So, a note was added to signpost the linkage.

A similar approach was taken to code observational data and documents. I was not looking for the number of occurrences of specific words/phrases, rather I were looking at the dominant ideas conveyed in these materials. After the initial coding, all codes that pertained to more than one data item were selected and arranged. Codes with shared meanings were kept together and further condensed into a broader code where possible.

Transcript	Codes	
	In-vivo/process codes	Concept codes
Interviewer: So that that brings me to the question, how, are the messages framed when you are engaging with the community? Participant: I think that that really comes then down to the person, the engagement practitioner and just the way they're facilitating that conversation. I do think it's actually an area that as a sector I need to develop a bit more, but I think it's about not necessarily prescribing or going in with These are the key messages I want to deliver but actually starting the other way around and listening to the questions and concerns that Community has.	Improvising ‘need to develop’ “listening to” community	

<p>So for instance, while the know your neighbour message might not immediately ring a bell, but you know if you have a discussion of well, but, what would be the benefits even though you have other networks of knowing your neighbours and how could you maybe nevertheless help each other or really finding the neighbour concept, is the neighbour only the person that lived next door or Is it someone else that lives a bit further away?</p> <p>I think yeah, it's sort of just a flexible. I think kind of flexibility and experience in how you engage rather than a hard and fast message and one of the really big messages that I have pushed in Canterbury and that again happened in a project that was a post earthquake project with a disability sector and that was sort of that concept around build a support network so it doesn't need to be your neighbour, but have three people that you could call on that can support you and that could either be a friend or family member It could be, Your social worker That you were working with or whoever, but yeah, have a support network, so that's there's probably Yeah, a little bit of uh redefined of know your neighbour message but broadening out a bit.</p> <p>So at the very, very highest level There's sort of three key parts of it. One is get to know each other so your neighbours or your wider community. The next one is create a plan together or you know, engage in planning together and then gets another next step in our very generic messages is become more formally involved in civil defense, and so that is at the very highest level, you know, how I phrase kind of the concept of Community response planning on our website.</p>	<p>'know your neighbour' - Building community 'benefits'</p> <p>'neighbour concept'</p> <p>'flexibility rather than hard and fast'</p> <p>'build a support network' - Building community</p> <p>'know each other' - Building community 'create a plan'</p> <p>'become involved'</p>	<p>Community helping</p> <p>Responsibility attribution</p> <p>Gradual process*</p>
--	---	--

* Gradual process – The message seems to change based on how involved/interested a person might be. Does this link to Audience segmentation? Refer W_V1 and C_EM2. Also look up Transtheoretical model of behaviour change and Tuckman and Jensen’s model of group development.

Figure 3.6 – Snippet showing how the transcript was coded.

The columns show the transcript, in-vivo/process codes and concept codes respectively. The codes with strike through are codes that were changed during the coding process. For the gradual process code, a memo was linked on NVivo describing my thoughts on the code.

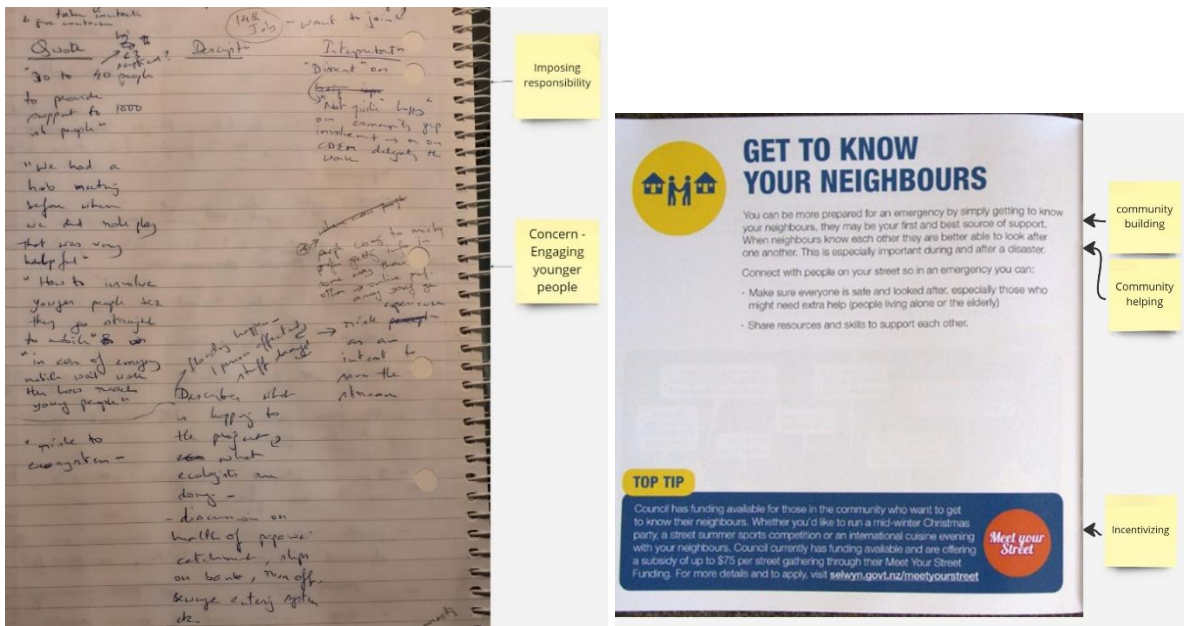


Figure 3.7 – The figure shows a snippet of codes for observation notes and documents. Images of the observation notes and documents were loaded in NVivo and relevant sections were coded.

To map the communication practices, I used network models (Miles et al., 2014). Figure 3.8 presents the network model of the communication practice for collective preparedness in Wellington showing the actors, processes and messages involved. This was developed after consolidating data from all Wellington interviews.

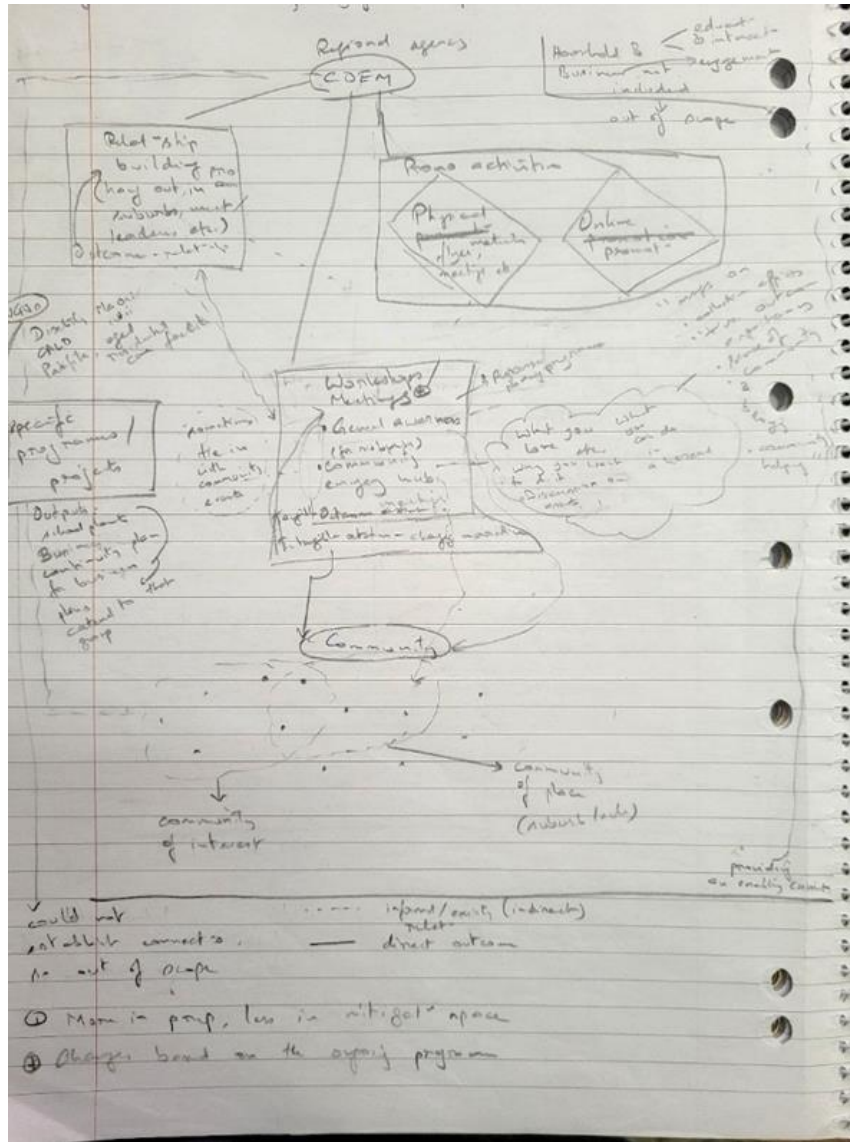


Figure 3.8 – Network model of communication practice for collective preparedness in Wellington

iii) Searching for themes - After I was satisfied with the codes, I started clustering the codes to identify potential themes. To ensure the themes are not 'thin'¹³, I aimed to have no more than seven themes per research objective and refined the themes iteratively (Braun & Clarke, 2012). During this process, attention was paid that the codes were meaningful to answer the research questions and codes that did not add value to analysis were not used. How the themes relate to each other and cross-cutting elements within the themes were considered. Analytic memoing and diagramming were extensively used during the process and a thematic map was generated at the end of the process. For example, to understand what messages are communicated to encourage collective preparedness, the following potential themes were generated.

¹³ Thin themes arise from a superficial or fragmented analysis of data, lacking the depth and richness needed for robust insights. A high number of themes often indicates thin themes, because the codes or subthemes have not been effectively clustered. It reduces the overall coherence and meaningfulness of the analysis.

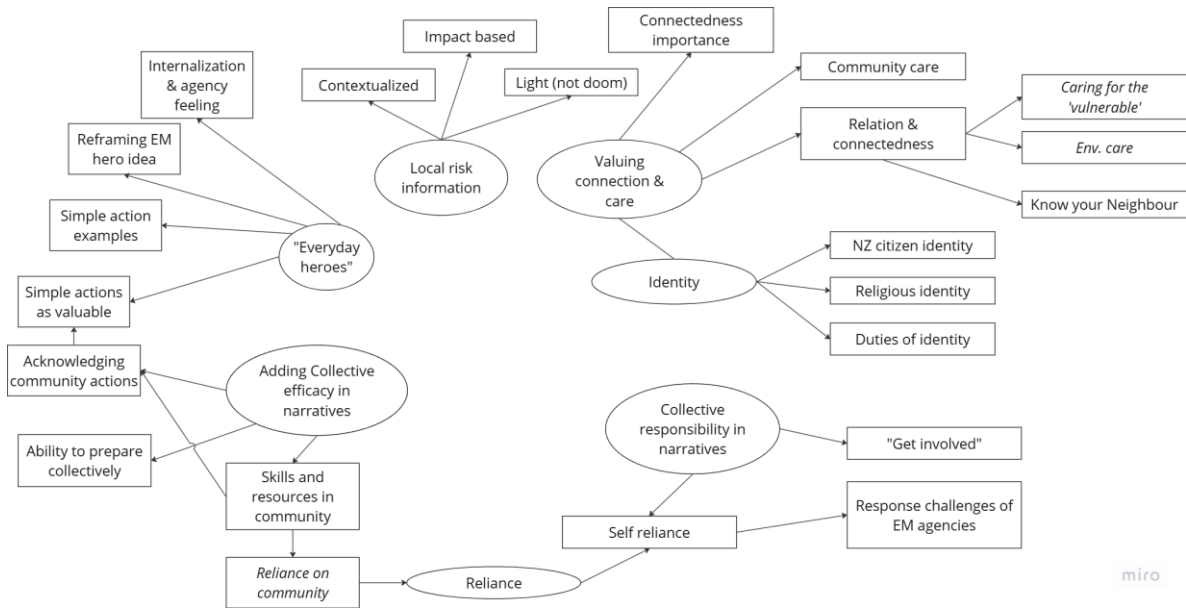


Figure 3.9 – Initial theme diagram

The theme diagram shows the initial themes for the question on what is communicated about collective preparedness.

iv) Reviewing potential themes - The potential themes were iteratively reviewed against the codes and memos to ensure the themes were coherent, meaningfully capturing the data, helpful in answering the research questions and neither too broad nor narrow. The findings from cross case analysis were also used on the process (refer section 2.2.4.3). Some themes were re-organized, collapsed, or split. Once I was satisfied with the themes, a final read of the data was done to ensure the important elements were captured in the themes. Figure 3.10 shows the final theme map for the research question on what is communicated about collective preparedness.

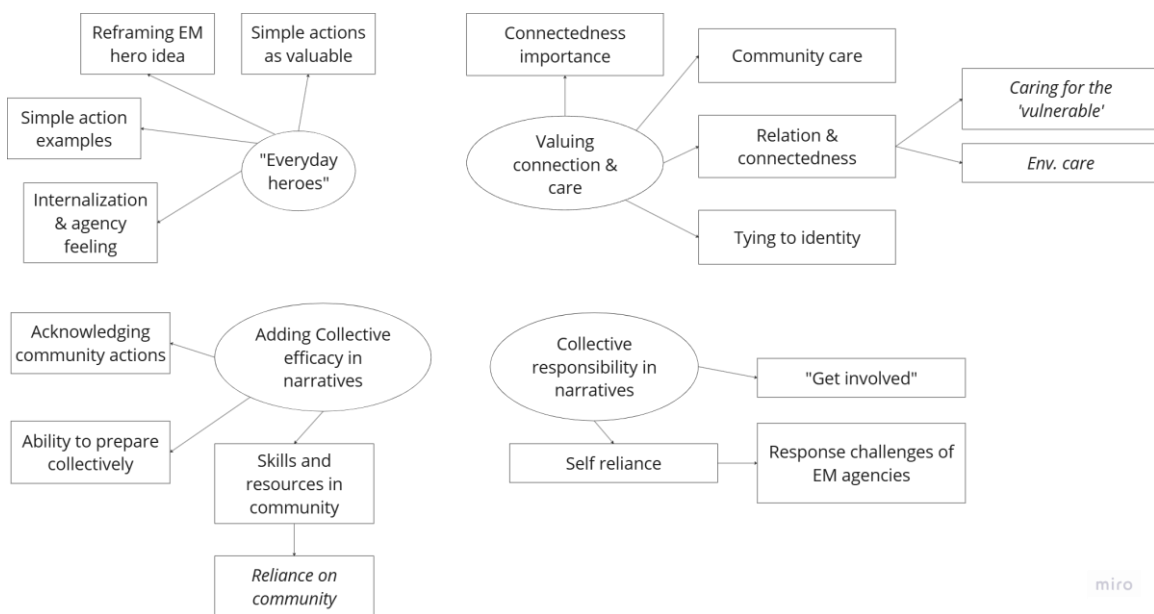


Figure 3.10 – Example theme map

Theme map showing the final themes for the question on what is communicated about collective preparedness.

v) Defining and naming themes - Once the themes were identified, the themes were labelled, a description of the theme was added, any subthemes were noted and the data extracts related to the themes were compiled and organized. Table 3.4 shows a snippet of the theme chart for the research question on messages.

Message - Theme chart	
Theme 1 - Reframing our understanding of heroes	<p>Describes how the understanding of who is helpful in a disaster is being changed. It is done by - moving away from response centric view of disasters (that considers only skilled practitioners are helpful), reshaping conceptions of what skills are needed after a disaster (<i>"No, you can just make a cup of tea, a sandwich and that's fine"</i>), expanding the idea that ordinary actions can be valuable (<i>"If it does not happen, it is because of you"</i>). No structured evident message about this (in documents/ pamphlets), but conveyed in conversations, meetings etc.</p> <p>This change in outlook implies that citizens are not thought of as passive recipients, but as active agents who can contribute (<i>"how could you maybe nevertheless help each other"</i>), thus improving citizen agency. This thought was reflected in participants as well who are increasingly recognizing that they do not need <i>"to be a superhero"</i> to contribute to disasters.</p>
Theme 2 - Including collective efficacy in narratives	<p>Outlines how collective efficacy is being included in narrative around preparedness. Highlights how collective preparedness is necessary and not just individual preparedness. Also convey that collective efforts will effectively reduce disaster risks – trying to build a sense of collective efficacy by highlighting community members can contribute by collectivizing (<i>"they have most of what they need within their communities to be able to deliver a response"</i>) and creating formal/semi-formal roles/avenues for them to work with emergency management professionals as a way to demonstrate that (community response team, community hub concept). Also, highlighting why they are needed (<i>"don't have all the staff and resources"</i>, so need community members to step up). This change in thought reflected in the participants as well (helping the officials in what they do by working at the very low level <i>"but that's what we are in our area"</i>).</p>
....	...

Table 3.4 – Snippet of the theme chart, showing theme label and description of that theme.

vi) Producing the report - Based on the research questions and the research gaps, I organized the themes in a coherent manner, and the findings are reported in chapters 4-8¹⁴. Separate chapters were not allocated to individual cases. Instead, I present findings of the cross-case analysis, with summary information from individual cases (Yin, 2018).

3.3.2.2.3 Cross case analysis

The core feature of cross case analysis is to maintain the integrity of the cases while exploring the similarities and contrasts between the patterns observed in the cases (Yin, 2018). The objective of

¹⁴ Refer section 2.4 on how qualitative and quantitative data was integrated.

cross case analysis is to understand what the patterns mean while being attentive to the unique contextual characteristics and complexity of each case (Bazeley, 2020). I adopted three techniques to conduct the cross-case analysis – writing case summaries, comparing case processes, and comparing codes across cases.

Case summaries are concise descriptions that capture essential information about individual cases, documenting their distinctive characteristics and contextual details (Bazeley, 2020). The purpose of writing case summaries is to highlight the key insights across cases and identify potential avenues for further exploration. Table 3.5 shows an example of case summaries of the Mt Cook and Arthur’s Pass group. This summary documents the context of the two groups.

Mt Cook group	Arthur’s Pass CRT
<ul style="list-style-type: none"> • <i>Location and background</i> - Emerged in 2007 as a residents' group in Wellington. Triggered by concerns over two development proposals affecting the community. One proposal involved a supermarket construction causing traffic and congestion. Another proposed routing State Highway One near Mount Cook School, raising safety concerns for children. • <i>Public Meeting and Formation of the group</i>: Community organized a public meeting to address concerns. The group formed as a citizen collective to represent the suburb's interests. Aimed to change the perception of Mount Cook as merely a route to the hospital. Sought to establish a distinct identity and recognition for the community..... 	<ul style="list-style-type: none"> • <i>Location and background</i>: Tiny community with around 30 residents. High level of trust, cooperation, and community involvement due to small size. Situated in alpine region with heavy rainfall and snowfall. Remote, faces temporary isolation, culture of self-reliance and preparedness. • <i>Historical Civil Defence Efforts</i>: Civil defence efforts initially led by Department of Conservation (DOC). Reliance on DOC's leadership and resources in the emergency response plan. Around 2006, locals took over civil defence role with support from Selwyn District Council. Council's role evolved, formalizing civil defence efforts with increased staff and resources by 2012.....

Table 3.5 – Case summaries of two cases

Case process comparisons are visualizations that show the processes and their connections as identified in the cases (Miles et al., 2014). They are concise depictions of the processes that may be challenging to analyse in written passages. Figure 3.11 below presents data from two of the four case models used for comparing the communication systems, resources, and processes across the different cases, the Wellington, and the Canterbury (Selwyn) case. The processes in black are common across both the cases. However, the Wellington and Canterbury specific processes are shown in grey and red respectively.

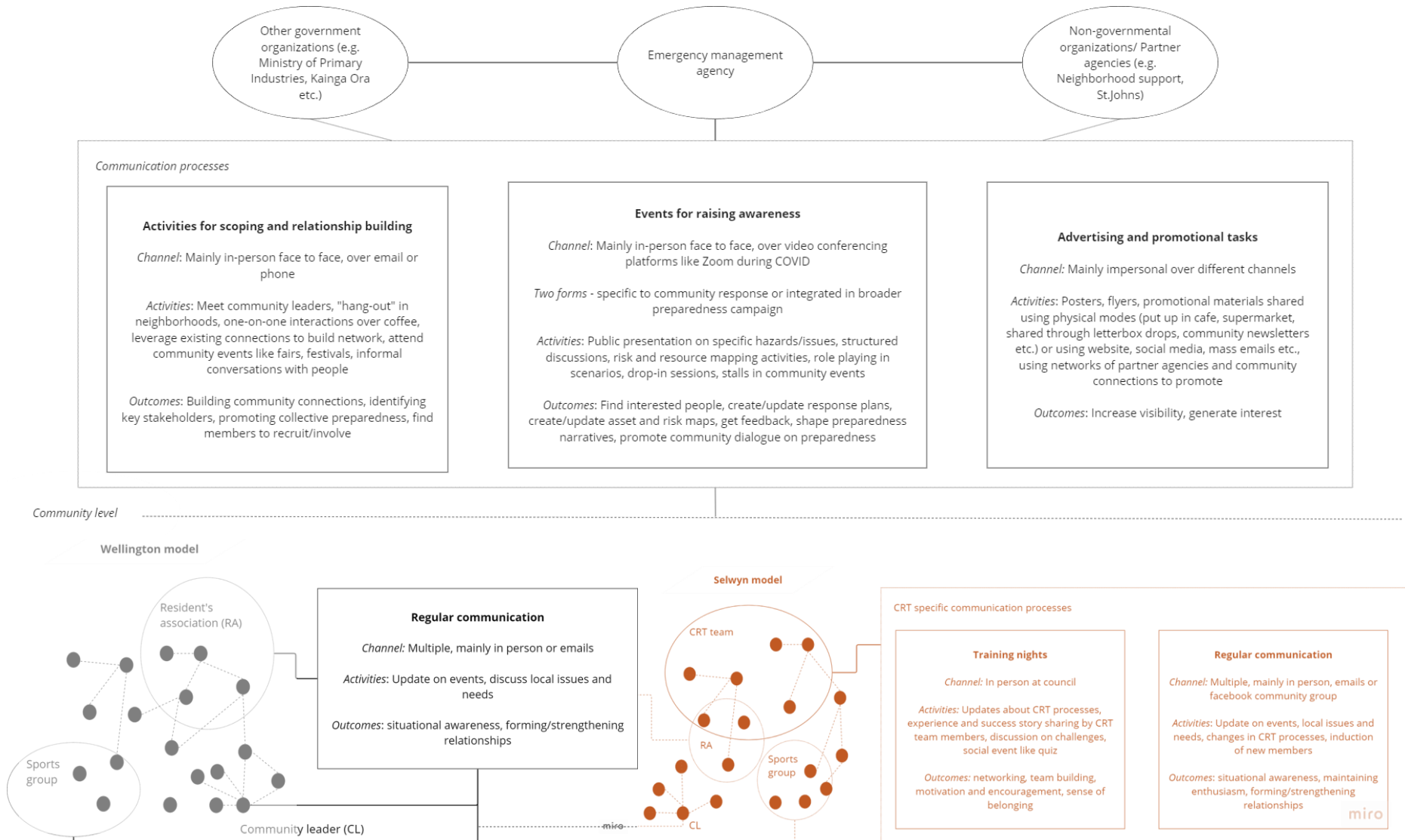


Figure 3.11 – Case process comparison of communication systems, resources, and processes

I also compared the association of different codes with each case to identify where the data converged and diverged (Bazeley, 2020). Figure 3.12 shows a table drawn from code comparison on factors influencing collective preparedness.

<i>Potential factors</i>	<i>Edgecumbe</i>	<i>Wellington</i>	<i>Arthur's Pass</i>	<i>Gore</i>
Hazard experience	Recent floods, group formed post floods	Recalled no major experience, (note: 2016 earthquake – area not impacted)	Recurring events	Location has hazard history, no major experience in past ten years Floods after group was formed
Hazard awareness	High after floods, reducing now	High, from media coverage, knowing from other groups in area, engagement with council/CDEM group	High due to frequent hazards, remoteness	Low when group was formed, high after floods
Facilitator	Council appointed Local person, proactive and respected and trusted by participants, Appointed after floods to support flood recovery and later added responsibility of facilitator	CDEM appointed, change of facilitator during study	Council appointed, A group existed previously, was declining after institutional support was withdrawn, grew again with facilitator and council support, proactive, respected and trusted by participants	CDEM group appointed, led from regional level, change of facilitator during study
.....				

Figure 3.12 – Comparison of factors influencing collective preparedness

Using the above techniques, I identified the similarities between the cases and reflect on why the similarities exist despite differences in the individual cases. I also discuss the differences and try to identify underlying concepts that can explain the differences (Yin, 2018). For example, from literature it seemed that hazard experiences were almost necessary for groups to emerge. However, from the code-comparison, it was evident that hazard awareness was an important parameter, not necessarily hazard experience. E.g., the Mt Cook case showed that groups can form even without a prominent hazard experience. Additionally, presence of a facilitator emerged as an important factor. Thus, hazard awareness and presence of facilitator became cross-cutting themes for facilitators of collective preparedness actions.

The integration of findings from thematic analysis and cross-case analysis followed an iterative process, where findings from one analysis informed the refinement of the other before arriving at the final themes.

3.3.2.3 Quality criteria

Quality criteria in qualitative research ensures the research is credible, trustworthy, and rigorous, providing valid and meaningful insights into the phenomena being studied (Creswell, 2007). For qualitative case study, it includes internal validity or credibility (Does the research provide an authentic representation of what was studied?), external validity or transferability (Are the findings transferable to other contexts? To what degree they can be generalized?), and reliability or dependability (Was the research conducted with care? If another researcher follows the same procedures, would they arrive at similar findings?) (Merriam, 1998; Yadav, 2022; Yin, 2018). Yin (2018) also recommends construct validity, which checks whether the parameters used to study the phenomenon give us reliable answers about the phenomenon and what the shortcomings may be. Additionally, as qualitative research is influenced by the researcher, reflexivity is another quality criterion (Creswell, 2007). It allows the researchers to critically reflect on their own beliefs, biases, assumptions, and experiences to identify how that may influence the research process and outcomes (Patton, 2014).

Drawing on these five quality criteria—credibility, transferability, dependability, construct validity and reflexivity—the next section presents the strategies employed to ensure the rigor of the study which include thick descriptions, diversity in data sources, triangulation, member checks, peer debriefs, using theoretical frameworks, maintaining a case study database, outlining positionality statements and ensuring reflexivity in analysis. Table 3.6 summarizes the strategies adopted corresponding to each quality criterion. The strategies are discussed in the section below.

Quality Criteria	Strategies adopted
Internal validity/ Credibility (Does the research provide an authentic representation of what was studied?)	<ul style="list-style-type: none"> • Thick description • Member checks • Diversity in data sources and triangulation • Data saturation • Guided by theoretical framework
External validity/Transferability (Are the findings transferable to other contexts? To what degree they can be generalized?)	<ul style="list-style-type: none"> • Thick description • Member checks • Diversity in data sources and triangulation • Guided by theoretical framework • Limitations outlined
Reliability/Dependability (Was the research conducted with care? If another researcher follows the same procedures, would they arrive at similar findings?)	<ul style="list-style-type: none"> • Diversity in data sources and triangulation • Guided by theoretical framework • Philosophical stance and positionality statement • Memo and field journal • Peer debriefs • Detailed description of the research process
Construct validity (Do the parameters used to study the phenomenon actually study the phenomenon?)	<ul style="list-style-type: none"> • Diversity in data sources and triangulation • Guided by theoretical framework • Peer debriefs • A case study database and chain of evidence

Reflexivity (How does my beliefs, biases and assumptions influence the research?)	<ul style="list-style-type: none"> • Philosophical stance and positionality statement • Memo and field journal • Reflexivity in data analysis
---	--

Table 3.6 – Quality criteria for case study research, and the strategies I adopted.

Thick descriptions are detailed evocative descriptions capturing not just the actions of the participants but also the underlying logic, emotions, and socio-cultural influences behind the actions (Walsh & Downe, 2006). It aims to offer an immersive experience for the readers, enabling them to perceive the situation as the researcher experienced it and draw interpretations. For example, thick descriptions are used in Chapter 6, where collective preparedness narratives are discussed. First, the context and perspectives on collective preparedness in participants' own words are presented, followed by interpretations of the underlying meanings. Providing thick description ensures that authentic representation of the phenomenon is provided, the evidence and interpretations are carefully linked without simplistic generalizations. It helps the readers understand where the findings might be applicable thus strengthening the credibility and transferability of the findings.

Triangulation refers to techniques that help researchers validate their interpretations by approaching the phenomenon of interest from different angles (Patton, 2014). Two analytical approaches, thematic analysis and cross case analysis were used on the data collected using interviews, observations, and documents, thus supporting methodological and data source triangulation. Additionally, adopting a multiple case study approach where the cases differ in their contexts supported environment triangulation.

Data saturation was obtained by conducting interviews until no new codes/concepts were emerging. It ensures that the data collected is sufficient to thoroughly study the phenomenon, which is crucial for maintaining the credibility of the findings. Member checks involve returning to the participants of the study with the researcher's interpretations or findings and asking them to provide feedback on the accuracy and relevance of the interpretations (Stake, 1995). I presented the findings to the respondents who showed interest in validating them through online presentations, informal meetings, and email conversations, and due changes were made.

Peer debriefs involve discussing the research process, findings and interpretations with a peer or colleague to enhance the reliability of the research. Throughout the research process, peer debriefs were done with the supervision team and colleagues. I also reached out to four researchers who possess expertise on the research topic for their insights and alternate explanations. For example, initially I developed the theoretical framework on collective preparedness communication using established social psychology theories such as protection motivation theory. However, I included concepts from the relational approaches of communication in the theoretical framework as an outcome of the discussions with other researchers. Thus, peer debriefs helped me in improving the dependability and construct validity of the study.

A theoretical framework helps in anchoring the study within the broader disciplinary tradition and ensures the indicators and parameters that will be studied to observe and interpret the phenomenon are valid and meaningful (Yin, 2018). However, it is challenging initially in an exploratory study as the phenomenon is not well understood and accepted parameters to measure it does not exist. So, I relied on my theoretical perspective (section 2.4) to identify relevant variables to study and reflect on the

findings with reference to prior literature. The phenomenon being studied and associated concepts are defined in each chapter.

The research questions, assumptions, and the research process is explicitly outlined to ensure other researchers can understand how the findings were derived (Mills et al., 2009b). A case study database was maintained to establish a clear audit trail (Yin, 2018). Analytic memos, field notes, diagrams, and data analysis products (cross case matrix, list of themes, diagrams etc.) can be cross referenced to understand how the data links to the interpretations, establishing the chain of evidence.

To maintain reflexivity in the research, analytic memos and field journals were maintained with my reflections. Attention was paid to how my perspectives and biases influenced the interpretation process. I also present my philosophical stance and positionality (sections 3.2 and 3.3.8) and discuss how it influenced the research (Korstjens & Moser, 2018; Rohleder & Lyons, 2014).

3.3.3 Quantitative survey design

The interview data indicated that most research objectives are not suitable/will not benefit from quantitative data. For example, most people did not remember the messages that encouraged them to engage in collective preparedness, rather they remembered who they received it from and how. So, the message related question was not included in the survey. Also, initially I aimed to test how different message contents targeting different motivation factors influenced people's intentions to engage in collective preparedness. However, during the interviews, it became evident that other parameters were more important than the message content. Therefore, I focused on a more exploratory approach, to understand those parameters further, and the connections and relationships between them. Moreover, over the course of the research I found that the number of participants engaging in collective preparedness is low, and no national or regional level dataset exists on groups engaging in collective preparedness. As such, recruiting participants became challenging and I was unable to utilize probability sampling or recruit the minimum number of participants required for robust statistical analysis. Eventually, I decided to collect survey data for only two research objectives: 1) *what factors influence people to participate and volunteer in collective action in disaster preparedness*; and 2) *identifying effective approaches to communicate about civic participation and collective action*. The process followed is described below.

3.3.3.1 Designing the survey

Drawing from the qualitative findings and the existing literature, the quantitative surveys were developed. Joint displays were used in this process (Creswell, 2014; Harrison et al., 2020). Joint displays are visual representations that help in integrating qualitative and quantitative phases of research in sequential mixed methods studies (McCrudden et al., 2021). I used joint displays to develop the survey questionnaire from the qualitative data in the following way: one of the objectives of this study was to identify the reasons behind an individual's participation in collective preparedness actions. To develop the survey questionnaire addressing this objective, I documented the themes emerging from the qualitative data, alongside the corresponding literature. Then based on the themes and the literature, I identified the items to be tested in the survey and developed the survey questionnaire. Figure 3.13 shows a snippet of the joint display showing the survey questionnaire items along with the themes and literature references that guided the survey development.

Lit/Themes	Item	Item content	Format
Sense of responsibility	Sense of responsibility for self	Assessment of participant's feelings of responsibility for safety of themselves and their family	Likert scale (1 to 5)
	Sense of responsibility for community	Assessment of participant's feelings of sense of responsibility for their community's (neighbours, students, friends etc.) safety.	Likert scale (1 to 5)
Group dynamics	Trust	Assessment of participant's trust in the group and its members	Likert scale (1 to 5)
	Leadership	Assessment of the participant's feeling about its leader(s).	Likert scale (1 to 5)
	Satisfaction	Assessment of the participant's level of satisfaction (enjoyment/comfort) when working with their peer volunteers on emergency preparedness.	Likert scale (1 to 5)
...	

Figure 3.13 - Snippet of the joint display used to develop the survey questionnaire on motivations

3.3.3.2 Survey data collection and analysis

Surveying involves systematic data collection from a sample drawn from a larger population (Blair et al., 2013). It is useful for “collecting information from or about people to describe, compare or explain their knowledge, attitudes and behaviour” (Fink, 2003, p. 1).

A 36-item self-administered survey questionnaire comprising both multiple choice and free text questions (Appendix 5) was administered between August and November 2023. The questionnaire is divided into four sections – participant profile (hazard experience, hazard training/education volunteering information, duration of stay in the location) (5 items), self-assessment on a Likert scale of 1 to 5 of influencing factors for collective preparedness (22 items), motivation (1 item) and communication related text response questions (2 items) and demographic details (6 items). 3 pilot tests were conducted on the survey.

The survey questionnaires were distributed in both hardcopy format and as an online link to the survey hosted in Qualtrics platform. I sought participants who were community members from the study areas (Bay of Plenty, Wellington, Canterbury and Southland) and who participate or volunteer in collective actions for reducing disaster risks at the community level. Snowball sampling was employed, where the surveys were shared with emergency management officials, community-based organization representatives, and community members from the study areas, who were then asked to share it with other people engaging in collective actions.

In total, 80 participants completed the survey (Table 3.7). Due to the limited number of responses to the survey, I used descriptive statistics, mainly mean and standard deviation, to describe the results derived from the survey data (Cooksey, 2020), presented in Chapter 5.

Participant profile (n = 80)	
<i>Gender</i>	
Male	41

Female	37
Undisclosed	2
<i>Age</i>	
18 to 30	3
31 to 45	9
46 to 60	27
60 to 75	37
Above 75	4
<i>Location</i>	
Bay of Plenty	3
Wellington	21
Canterbury	51
Southland	5

Table 3.7 – Demographic profile of survey participants

3.3.3.3 Quality Criteria

While the survey provides important descriptive insights, it has multiple limitations because of the small sample size, non-random sampling method, and potential biases in self-assessment.

The small sample size and the non-probability sample limited the generalizability of the findings. Additionally, the survey only targets people in the four regions, has a skewed geographic representation, and possible sampling bias due to snowball sampling. These limit its external validity as well. Regarding reliability, I conducted pilot testing, however, it was again limited (3 people), and other reliability tests were not conducted which potentially compromises the reliability. Although potentially confounding factors such as previous disaster experiences and socio-economic status included in the survey, with the small sample size controlling the confounding variables would not produce reliable results.

Considering the above limitations, only a part of the survey data - responses to survey questions on the communicating actors (survey question no. 8) and the communication practices (survey question no. 9) - were used in Chapter 5. The rest of the survey findings were treated as secondary data to understand the study population and their perspectives. The full survey questionnaire is present in Appendix 5 and the survey data is present in Appendix 10 for reference.

3.3.4 Integrating the data sets and drawing inferences

The qualitative and quantitative data were analysed separately. At the last stage of the exploratory sequential design, the two datasets are integrated for drawing interpretations. To do this, results from both datasets are entered in a joint display (Creswell, 2014). The datasets are compared to identify similarities and differences, understand how the findings explain each other, and the metainferences (or, interpretations) that can be drawn (Creswell, 2014).

For example, for the research question exploring communication systems and processes that support collective preparedness, one theme is interpersonal relationships. The qualitative and quantitative findings related to that theme are tabulated and compared looking for convergence, divergence, and

possible explanations. Based on this the metainferences are drawn, which are then reported in the chapter findings.

Theme	Qualitative findings for the theme <i>interpersonal relationship</i>	Quantitative results	Metainferences
Interpersonal relationships	<p>Communicators leveraging own connections and relationships (example statement - "I'm Pacific by descent ... familiar with where Pacific people gather... I'll pop in and say hello ... can I just come introduce myself and just let you know about our programs and if you're interested, I can connect you to the team member that that that looks after that area")</p> <p>Previous long term relationships helped in identifying people to recruit, organizing and collectivizing (example statement - "we already had an existing relationship with these guys because of rural fire. And then I ... kept on talking once they stopped doing rural fire. ..it came down a lot to personal relationships..")</p> <p>Usefulness of interpersonal approach (example statement - "you still see them on the street and say hello and get information and thats I guess the best way.")</p> <p>Challenge in relationship based approach (example statement - "something I'm also working on is figuring out how...I can build relationships with some of the underrepresented communities or like communities, I just don't necessarily have relationships with.. that's definitely a growth area for me")</p> <p>.....</p>	<p>Most people were recruited through interpersonal influence (shoulder tapped/invited by someone I know). 23 responses (n = 80).</p>	<p><i>Convergence</i> - Both findings emphasize the effectiveness of interpersonal influence in recruiting new members, with individuals being recruited primarily through personal connections and relationships.</p> <p><i>Divergence</i> - Challenges in forming relationships with underrepresented groups using relationship based approach.</p> <p><i>Metainference</i> - Current communication approach for collective preparedness heavily rely on interpersonal relationships. It is effective to organize and sustain collective preparedness.... However, connecting with under-represented groups using a relationship based approach is challenging and needs exploration in future research.</p>

Figure 3.14 - Joint display for exploratory sequential mixed methods design.

Adapted from Skamagki et al. (2022)

One of the main challenges with the integration was the limitations of the quantitative data (as discussed in Section 3.3.3). For some questions, quantitative data could not be collected, while for some others, quantitative data was not found suitable. For these questions, I relied on the qualitative data. Thus, the research eventually became qualitative heavy with minor quantitative components.

3.3.5 Quality and rigour in mixed methods research design

Some scholars present the quality criteria according to different stages of mixed methods research (Creswell, 2014; Teddlie & Tashakkori, 2009b) while others suggest broader guidelines applicable across stages of qualitative and quantitative methods (Onwuegbuzie & Johnson, 2006). Plano Clark and Ivankova (2016), identify three prominent criteria across the different views – i) assessing the

quality the quantitative and qualitative studies, ii) assessing the quality of inferences from the entirety of a study, and iii) addressing quality concerns inherent in mixed methods design.

Assessing the quality of the quantitative and qualitative studies: The quality of the qualitative and quantitative studies within the mixed-method approach are assessed against their respective quality parameters (Plano Clark & Ivankova, 2016). The quality criteria adopted in this study for the specific studies is discussed in section Quality criteria 3.3.2.3 and 3.3.3.3.

Assessing the quality of inferences from the entirety of a study: In this study, the integration happened in two steps. First, the qualitative findings helped in developing the quantitative survey. I used joint displays in this process (Creswell, 2014; Harrison et al., 2020) (refer section 3.3.3.1). Then, at the end of the quantitative phase, both the qualitative themes and the quantitative results were again compared using joint displays to identify commonalities and differences, identify how they explain each other and draw meta-inferences (Skamagki et al., 2022) (refer section 3.3.4). Inconsistencies in findings were noted and identified as gaps and future research questions. This process ensures that the meta-inferences are rich and based on both study's findings (Fàbregues & Molina-Azorín, 2017). Rigor was also enhanced by outlining a theoretical perspective that represented the researcher's prior understanding of the phenomena, facilitated reflection on the findings in light of the existing knowledge, and ensured thorough consideration were given to alternative explanations (Leech et al., 2010; Teddlie & Tashakkori, 2009b).

Addressing quality concerns inherent in mixed methods design: The third quality criteria assesses whether the chosen design is suitable to answer the research questions. Design quality can be assessed by evaluating design suitability (Is the design appropriate to answer the research questions?), within-design consistency (Do the qualitative and quantitative strands fit logically?), analytic adequacy (Are the data analysis strategies suitable to answer the research questions), and design fidelity (are quality criteria maintained in the qualitative, quantitative, and mixed methods procedures? (Teddlie & Tashakkori, 2009b).

- The mixed methods design guiding this study is presented and the rationale for its selection is explained in section 3.3.1, to illustrate the design suitability of the study. However, after the qualitative phase of the research was completed, I perceived that quantitative surveys were not suitable to answer some of the research questions. The research reflects this consideration and only data suitable for quantitative studies were gathered using surveys. For example, for studying effective communication practices to promote collective preparedness, studying the communication messages quantitatively was not appropriate (refer Chapter 6), and hence it was not included in the survey.
- Peer debriefs on the research design was held during the start of the research to ensure there was within-design consistency.
- The rationale for selecting specific analytic techniques, how they were adopted in this study (sections 3.3.2.2 and 3.3.3.2) and what quality criteria were followed is provided (sections 3.3.2.3 and 3.3.3.3). For example, I maintained memos and field notes to maintain reflexivity during the qualitative phase.
- Design fidelity is also covered within the quality criteria for qualitative and quantitative studies (sections 3.3.2.3 and 3.3.3.3). For example, I explain how data saturation helped in improving credibility of the qualitative data. As the quality of inferences produced in one phase

significantly affects the quality in the following phase in sequential studies (Plano Clark & Ivankova, 2016), I strictly adhered to the quality criteria in the qualitative study to ensure the findings influencing the quantitative design were robust.

The table below summarizes the quality considerations for this research.

Quality criteria	Strategies adopted	Related sections
Assessing the quality of the quantitative and qualitative studies	<ul style="list-style-type: none"> • Following quality criteria suggested in qualitative studies. • Following quality criteria suggested in quantitative studies. 	Sections 3.3.2.3 and 3.3.3.3
Assessing the quality of inferences from the entirety of a study	<ul style="list-style-type: none"> • Qualitative and quantitative findings integrated suitably • Inconsistent findings discussed • A theoretical framework guided the interpretations 	Sections 3.3.3 and 3.3.4
Addressing quality concerns inherent in mixed methods design	<ul style="list-style-type: none"> • Reflection on methodology and necessary adjustments throughout the study • Peer debriefs on the research design • Describing rationale for selecting specific methods and techniques • Robust first phase study (in this case, the qualitative study) 	Sections 3.3.2.3 and 3.3.3.3

Table 3.8 – Quality criteria adopted in this research

3.3.6 Summarizing research methodology

Overarching research objective: How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?			
<i>Exploratory sequential mixed methods design</i>			
<i>Qualitative data collection and analysis</i>			
Interviews			
35 interviews of 1 to 1.5 hours conducted between Feb 2022 and Sep 2023. Participants include officials from emergency management agencies, non-governmental agency representatives and community leaders, and volunteers.			
Observation			
Observation notes from six community meetings related to preparedness - community emergency hub training (1), group meetings (4), and an annual training night (1). Field notes were taken in Wellington (where I live) between Feb 2022 and Sep 2023. Field visits and field notes from three sites, Edgecumbe, Gore and Arthur’s Pass were taken between May 2023 and Sep 2023. Social media content on preparedness shared by emergency management organizations and the community groups under study (e.g. Selwyn Community Response Team) between June 2022 and Sep 2023 was noted.			
Document collection			
Community preparedness, mitigation, and capacity development related communication material including posters, flyers, documents etc. available in print or electronic media of i) emergency management groups and ii) community groups and NGOs working on collective initiatives for DRR			
Thematic and cross-case analysis			
<i>Quantitative data collection and analysis</i>			
Questionnaire survey			
Snowball sampling of community members engaging in collective actions in DRR, 80 completed responses between August and November 2023			
Descriptive statistical analysis			
Research questions	Research objectives	Data collection & analysis	Ch.
	To explore what is civic participation and collective action in the pre-disaster stage	Qualitative	4

RQ1. What is civic participation and collective action in disaster preparedness in New Zealand?	To understand their nature and forms	Qualitative	
	To document the activities happening through collective actions at the community level and their outcomes	Qualitative	
	To identify how they emerge	Qualitative	
	To assess what factors influence people to participate and volunteer in collective action in disaster preparedness	Qualitative & quantitative	
RQ2. What communication practices are used to encourage civic participation and collective actions in disaster preparedness?	To identify what is communicated to encourage civic participation and collective action in disaster preparedness	Qualitative	5,6 & 7
	To understand how it is communicated	Qualitative	
	To identify the emerging practices	Qualitative	
RQ3. What are the effective approaches and considerations when encouraging civic participation and collective actions in disaster preparedness using communication?	To identify civil defence officials', stakeholders' and community members' perspectives on effective approaches to communicate about civic participation and collective action	Qualitative & quantitative	5, 6 & 7
	To identify main considerations when using communication to encourage civic participation and collective action	Qualitative	

Table 3.9 – Summary of research methods

3.3.7 Ethical considerations

A low-risk notification was obtained from the Massey University Human Ethics Committee on 26.08.2021 bearing Ethics Notification Number: 4000024945 (Appendix 2). A low-risk notification was requested because the study involved semi structured interviews and surveys with participants on their experiences in the pre-disaster context, which was evaluated through peer-review as unlikely to cause discomfort to participants. An information sheet was shared with all participants while scheduling interviews for data collection. The sheet outlined the research objectives, researcher details, and rights of the participants. Before beginning interviews, I briefly reiterated the contents of the information sheet and answered any questions the participants may have. Following this, the participants filled an online version of the informed consent form. The forms and the data collected through the interviews are stored in a secure password protected folder. All identifying information were removed during the transcription of the interviews. Verbal consent of the participants was obtained before recording any audio or video of the interview. Special attention was taken to be respectful towards the participants.

3.3.8 Researcher Positionality

Before discussing the findings of the study, I would like to briefly reflect on my background, professional training and lived experiences as it affects my positionality with respect to the research topic. New Zealand is not my birthplace, and English is not my first language, marking me as an immigrant researcher, an outsider. My education in India has been predominantly Eurocentric and my research supervision team comprised of pākehā (European descent) scholars integrated in varying levels in the New Zealand community. Professionally I have worked both within the government system and am a volunteer myself. Thus, as a researcher, I find myself at a complex insider-outsider dichotomy, insider as a volunteer and as someone who has worked in the government system, but outsider in the New Zealand context, and it is with this position that I conduct this research.

I also acknowledge that any research on volunteering, civic participation, and collective action is inherently political and operating in a contested terrain of power. I am also conscious of the postcolonial history in New Zealand. However, given the experience of wearing both hats, of a volunteer and working in the government system, I was keen to bring in both perspectives, trying to capture the voice of the community members while acknowledging the constraints of officials, who are also people, working in the system – which places my voice somewhere in between, without valuing one voice more against the other. My efforts in this focused on using the language of my participants as much as possible, identifying practical ways for government systems and communities to work together while also highlighting systemic issues that throttle participatory processes, and what necessary changes are required.

3.4 Chapter Summary

This chapter presents the research design. It discusses the research paradigm and the rationale behind selecting a pragmatic approach. Following this, the methodology section delves into the research strategy, a sequential mixed methods approach chosen to carry out the study and details the techniques employed for data collection and analysis.

The findings of this research are presented next (Chapter 4 - 7). The following chapter (Chapter 4) explores civic participation and collective action in disaster risk reduction (DRR) in New Zealand. Specifically, it examines their characteristics, emergence, and resulting outcomes. This chapter establishes the study's contextual backdrop before delving into communication-related research questions in subsequent chapters.

Chapter guide

Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.	What are we studying?	
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study	How are we studying it?	
Chapter 4 Civic participation & collective action	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Existing communication practices	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Communication content	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Emerging areas of communication	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Chapter 4 Civic participation and collective actions for reducing disaster risks at the community level: Insights from Aotearoa New Zealand case studies

Background: This chapter presents the first manuscript of the thesis. This thesis aims to understand the communication approaches that promote people's participation and collective action in reducing disaster risks. When this research commenced, there was limited literature in New Zealand on pre-disaster community actions undertaken collectively to reduce disaster risks, despite the presence of substantial international literature. Therefore, this chapter establishes the context for this thesis by exploring what civic participation and collective action for disaster risk reduction mean within New Zealand, providing a foundation for the analysis of communication approaches in the subsequent chapter.

The manuscript is currently published as: Das, M., Becker, J., & Doyle, E. E. (2024). Fostering civic participation and collective actions for disaster risk reduction: Insights from Aotearoa New Zealand case studies. *International Journal of Disaster Risk Reduction*, 114, 104954.

Earlier versions of the article were presented at:

- Das, M., Becker, J., Doyle, E. E. H., & McBride, S. (2023, June). Strengthening disaster preparedness from ground up: A study of community groups in New Zealand [Oral Presentation]. XX ISA World Congress of Sociology, Melbourne, Australia.
- Das, M., Becker, J., Doyle, E. E. H., & McBride, S. (2022, September). Communication, Community Action and Disaster Resilience [Lightning Talk]. 2022 QuakeCoRE Annual Meeting – Te Hiranga Rū QuakeCoRE, Napier, New Zealand.

Abstract

This paper explores how emergency management organizations collaborate with communities in the pre-disaster stage and support collective actions to reduce disaster risks. Utilizing four qualitative case studies from New Zealand, we examined how local groups interested in reducing community level disaster risks form, the nature of their collective actions and collaboration with emergency management organizations, their facilitators and barriers and the outcomes of the processes. The findings suggest that people's involvement, collaboration, and collective action in the pre-disaster stage entails participating in programmes administered by emergency management organizations through diverse community groups, informal emergency response teams, and specialized volunteer groups. The two primary goals are to have a group of people ready to provide immediate support in an event by maintaining community response teams and making prior arrangements that support people to spontaneously volunteer in an emergency, through community emergency hub approach. These groups engage in tasks such as creating community response plans, maintaining resources, and fostering communication and social capital. The factors facilitating these efforts include hazard awareness, community conversations, institutional support and active DRR organizations, clear objectives, skilled facilitators, and ensuring community solutions are supported. However, we find that the current approaches are narrowly focused on immediate response, lacking a broader perspective of addressing developmental and environmental issues that create risks. They are also rooted in the

idea of a solidaristic community and rely on social capital. We discuss the implications of the current practices and the way forward.

Keywords: *collective action, community participation, community response team, community emergency hub, disaster risk reduction*

4.1 Introduction

Aotearoa New Zealand (NZ) is exposed to a range of natural hazards and has witnessed multiple devastating disasters in the past (Potter, Becker, et al., 2015). Given the disaster history, identifying ways to improve disaster management have always been a government priority. In 2019, New Zealand released the National Disaster Resilience Strategy which outlines the vision and goals of emergency management for the next 10 years in New Zealand (Ministry of Civil Defence & Emergency Management, 2019). Under its third priority, it emphasizes the need for collective actions to improve disaster resilience and explicitly states that “collective action, by, with and for the individuals, families/whānau, and groups who live in communities” is required to build a disaster resilient nation (Ministry of Civil Defence & Emergency Management, 2019, p. 31). The existing regulatory framework, guided by the 2002 Civil Defence Emergency Management Act, the Resource Management Act, 1991 and the Local Government Act 2002, also highlight the need to involve communities in disaster risk reduction.

To promote collective actions, we need to understand what do we mean by collective action, how do they emerge, what is their nature and forms, what activities are happening through collective actions and what are their outcomes? Answering these questions are necessary for developing programmes and guidelines that are effective in supporting, promoting, and sustaining the collective actions necessary to manage disaster risks.

Reflecting on academic literature, we find that actions to reduce disaster risks can either be at an individual or a collective level. For example, being aware of evacuation routes, knowing recommended protective behaviours, and developing a household evacuation plan are individual level actions. Participating in community consultations, collaboratively developing community response plans, and getting involved in community response teams are community or collective level actions (Antonietto Mitchell et al., 2010; Sutton & Tierney, 2006). Contemporary researchers acknowledge that focusing on preparedness and mitigation efforts at the individual levels may not suffice to reduce disaster risks (Ireland & Thomalla, 2011; Yuanjaya & Fajri, 2020). It is crucial for communities, rather than just individual households, to have the capability to collaboratively mobilize resources, interact with different stakeholders, participate in the decision-making processes, strategize on enhancing preparedness for future disasters and develop the capacities of the community at large (Uscher-Pines et al., 2013). Community level actions are effective in building resilience even among the most vulnerable groups (Rivera et al., 2015), enable greater public participation in decision making and help in supporting government actions when there are resource deficits (Garvey & Paavola, 2022; Zivari et al., 2019). Thus, research highlights the need to encourage collective actions and invest time and efforts in supporting them.

While a general notion of collective action exists, there is still a need to develop the concept theoretically and establish accepted practices, common terminology, and basic principles (Willis,

2014). In this context, the paper explores: i) the concept of collective action and its forms in the pre-disaster stage; ii) the factors influencing emergence and sustenance of collective actions; and iii) the activities and resulting outcomes.

4.2 Literature Review

4.2.1 Conceptualizing collective action and defining key terms

Disaster risk reduction (DRR) involves reducing disaster risks by systematically acting on the elements that cause disasters, including reducing vulnerabilities and exposure of people, improving preparedness to adverse events, and undertaking activities that fit within the broader context of sustainable development (United Nations International Strategy for Disaster Reduction, 2009). DRR actions in the pre-disaster stage primarily include preparedness and mitigation actions.

The term ‘collective action’ has been used variously in DRR literature, primarily drawing from economy and ecology, social protests and movements and volunteering literature. It has been used to describe the collaborative actions among landowners in wildfire-prone regions like implementing prescribed burns, fuel treatments, and the strategic placement of fire-resistant plants to mitigate the risk of wildfires (Charnley et al., 2020; Sapkota et al., 2015). Participation in community consultations and collaborative development of response plans¹⁵ by community members is also considered as ‘collective action’ (Antonientte Mitchell et al., 2010). Rallies and protests demanding mitigation of a hazard facing a community is another form of ‘collective action’ (Bera, 2019). ‘Collective action’ also refers to volunteering, where “a group of people ... voluntarily engage in a common action to pursue a shared interest”. (Ireland & Thomalla, 2011, Introduction section, para. 2). Based on the above, collective action for DRR can be considered as the “joint activities by a wide group of actors on the basis of mutual interest” for improving the condition and well-being of the community by reducing disaster risks (Bamberg et al., 2015, p. 161).

Closely related to this idea of collective action is civic participation. Civic participation refers to the activities that individuals undertake beyond their immediate responsibilities to support the well-being of the community, and thereby contribute to the community life (Cnaan & Park, 2016). Civic participation at the individual level to address shared concerns or goals, leads to collective action (Evers & von Essen, 2019; Jordana, 1999). Thus, both civic participation and collective action are of interest in this study.

Another central concept in collective action is community. Communities refer to groups of people who share same geographic location, demographic characteristics (gender, race etc.) or interests (leisure activities, common interests etc.), and from which people derive a sense of identity and belonging (McMillan & Chavis, 1986; Odella, 2012). The degree of integration of individuals in their respective communities differ; nevertheless, people within the same community are more inclined to interact, establish connections, and share both material and immaterial resources (Odella, 2012). Communities,

¹⁵ Community response plans identify hazards facing the community and develop standard operating procedures for response to and recovery from hazards

however, are not holistic entities and are composed of people with diverse interests and priorities (Curato & Calamba, 2020).

4.2.2 Forms of civic participation and collective action

The concept of community participation in disasters emerged in 1970s broadly referring to community involvement in disaster management. However, over the decades the term has expanded to signify a wide range of concepts, forms, and modalities. Disaster preparedness literature views participation as the ongoing two-way dialogue between officials, technical experts, and community members about hazard risks and preparedness through which people's engagement in individual or family level preparedness and mitigation activities can be improved, thereby minimizing their chances of being affected by disasters (Abunyewah et al., 2020; Adams et al., 2017; Ryan et al., 2020). The emphasis here is on the individual action and outcomes, which collectively enhance the community's overall preparedness (Dharmasena et al., 2020).

On the other hand, disaster and development literature considers participation as the involvement of people in collectively addressing hazard risks through community-based disaster management (CBDM, CBDRR, CBDRM) practices (Delica-Willison & Gaillard, 2012; Shaw, 2012). It is rooted in concepts of community self-help, empowerment, and self-determination by local people (Victoria, 2003). At the community level this typically involves local people forming groups (like community disaster management teams), and working in close collaboration with civil defence agencies and different stakeholders to identify hazard risks, strengthen the community capacity, ensure emergency response plans are in place, address developmental concerns that cause community level vulnerabilities etc. (Brennan & Flint, 2007; Flint & Stevenson, 2010; Ossey et al., 2017; Phibbs et al., 2016). Studies drawing from the environmental and ecological tradition also follow the above concept of participation as collective actions by groups of people (Canadas et al., 2016; Hardin, 2015; Ostrom, 2010). The goals, however, are targeted towards mitigating hazard risks through decentralized environmental risk governance and management actions, like implementing fire management strategies (Charnley et al., 2020), catchment monitoring and maintenance (Garvey & Paavola, 2022), long term environmental stewardship (Sapkota et al., 2015) etc. The degree of organization, and institutionalization of these groups vary, ranging from informal groups of interested people to formally recognized, trained groups with legal mandate to implement community level risk reduction initiatives (Carr & Jensen, 2015; Cook et al., 2012; Curato & Calamba, 2020; Gentle et al., 2020).

In disaster resilience literature, participation signifies both the forms mentioned above. Resilience literature also recognizes that individuals are socially situated, and social networks and connections formed in the pre-disaster stage help in quickly securing information, support and mobilizing resources to respond after an event (Aldrich & Meyer, 2015; Ozanne & Ozanne, 2013). As such, participation in community groups, that are not directly engaging in emergency management activities but contribute towards social networks, nurture sense of belonging, collective efficacy beliefs, promote social learning and improve social capital become relevant, for example, participation in timebanks, food-banks and other community initiatives (Hasnain et al., 2023; Ozanne & Ozanne, 2016; Tidball & Krasny, 2007). The conceptual vagueness, however means that participation in resilience can imply "anaemic forms ... that are designed to stimulate public awareness" to decentralized participatory governance that is "legitimised and resourced" (Stark & Taylor, 2014, pp. 302, 311) – which sometimes leads to conflicting

perspectives on what participation looks like, what it should achieve and limits its potential (Curato & Calamba, 2020; Fekete et al., 2014; Rogers, 2015).

In New Zealand, community participation for reducing disaster risks have traditionally focused on individual preparedness actions with the assumption that wide spread adoption of preparedness measures will improve the overall community preparedness and contribute to resilience (Blake et al., 2017; Dharmasena et al., 2020). However, the Christchurch earthquake and subsequent emergencies demonstrated that the social networks and community groups in a locality play a crucial role in providing immediate information and resources, as well as in mobilizing support for those affected (Ozanne & Ozanne, 2016). It highlighted that effective disaster response requires considerations beyond individual preparedness; it needs to strengthen community groups and social networks to enable collective actions during emergencies. To achieve this, emergency management agencies are increasingly collaborating with community groups and stakeholders in the pre-disaster stage, focusing on enhancing their capacity and capability to support their communities during emergencies. Multiple initiatives are currently underway for this purpose (Hawke's Bay Emergency Management Group, 2024; Selwyn District Council, 2024b; Wellington Region Emergency Management Office). However, limited academic literature explores these initiatives - what are their nature and forms, how civic participation is conceptualized in them, and what disaster risk reduction (DRR) strategies and goals they are designed to contribute to. Without a systematic understanding of the different forms of civic participation in DRR, identifying ways to improve them and promote collective action is difficult. As such, the first research question investigates:

RQ1: What are the nature and form of collective action and civic participation in the pre-disaster stage?

4.2.3 Factors fostering civic participation and collective actions

Civic participation and collective action in DRR can emerge organically or can be organized through the support of an agency. Community groups working collectively on disaster preparedness often emerge organically after a hazardous event (McEwen et al., 2012). For example, the South Dunedin Community Network formed post-2015 floods, after the council organized an event connecting local community organizations, businesses, and residents. Currently, the group facilitates community dialogue on flood and climate change issues, bridges community-council communications and advocates for equitable flood mitigation actions (South Dunedin Community Network, 2024). Local members take an active role in identifying needs, setting priorities, and implementing solutions. Decision-making comes from within the community, rather than external organizations or authorities.

Civic participation can also be agency driven - facilitated by governmental agencies, non-governmental organizations, and academic institutions, who implement an intervention within the community. In Hawkes' Bay, decision makers initiated the process to develop a coastal adaptation strategy by forming a collaborative working group comprising local authorities, Māori leaders and community representatives. The group assessed and prioritized options developed by a technical advisory committee to create policy pathways for mitigating coastal hazard risks such as flooding and erosion (Ryan et al., 2022). In Northland, the government form priority catchment groups to promote engagement and communication between councils and communities for addressing flood risks (Auliagisni et al., 2022). In the "Living at the Edge" project, the research team supported community-

centred decision-making process for creating a strategy to build resilience to coastal hazards (Kench et al., 2018). Externally initiated projects often involve a facilitator who mobilizes existing community groups or forms new groups. Generally supporting agencies withdraw funding and reduce active involvement after the groups becomes operational.

Encouraging communities to undertake collective actions for DRR is challenging and often unsuccessful (Godschalk et al., 2003; MacAskill, 2019). Agency driven initiatives take hierarchical top-down approaches guided by pre-determined objectives established by the agency with the decision-making power residing with the agency. Such initiatives often fail to integrate the needs and priorities of community members and remain uninformed by the context, culture, practices, and norms (Wu, 2020); consequently failing to gain community interest or identify acceptable innovative solutions. The rigidity and structure of agency led approaches stifle emergent properties in newly formed groups. Community-led initiatives, on the other hand, tap into local knowledge, aspirations, and commitment, promotes ownership and increases the likelihood of positive change within the community (Phibbs et al., 2016). Such approaches that emerge through the participation of diverse community stakeholders are preferred over agency-led approaches as they tap into local knowledge, aspirations, and commitment, promoting ownership and increasing the likelihood of positive change within the community (Benson et al., 2001; Phibbs et al., 2016). This approach however faces challenges like difficulty in gaining community interest, undue influence of powerful voices in shaping community priorities etc. and has achieved limited success in empowering communities (Cretney, 2018; Pomeroy & Holland, 2016; Zhang et al., 2013). As such, in some situations, a combination of agency led and community led approaches are considered to be more suitable (Gaillard & Maceda, 2009; O'Brien & O'keefe, 2013).

Literature, however, lacks a nuanced understanding of the factors and processes that foster civic participation and collective actions in DRR; like what encourages community groups to engage in collective action, how contextual factors, local institutions and stakeholders influence the process, when groups emerge organically and when supporting mechanisms are required (Simpson, 2000). Gaining a comprehensive of the contextual factors, facilitators and their interactions is important inform policies and programmes to foster civic participation and collective action (Schneider et al., 2020). As such the second research question is:

RQ2: How do collective actions and civic participation emerge in New Zealand and what facilitates the process?

4.2.4 Activities and outcomes of civic participation and collective action

The outcomes of civic participation in disaster risk reduction primarily include: i) knowledge creation and awareness generation, and ii) the implementation of risk reduction measures.

Community members are often engaged to develop knowledge products that improve current understanding of hazard risks and raise awareness. For example, in participatory mapping (or community mapping), emergency management agencies bring together community members to produce maps of their areas based on local knowledge and experience and integrate it with scientific knowledge (Cadag & Gaillard, 2012). Maps produced through such processes are often easily comprehensible and help in building hazard awareness within the community. Co-creation of hazard

awareness products, involvement of people for data collection in citizen science initiatives, community engaged monitoring and warning system are some of the activities where community involvement is increasingly sought (Lempert et al., 2023; Mamoru et al., 2022; Stone et al., 2014; Tan et al., 2022). While community involvement in such task-oriented actions are often for a limited duration, these actions catalyse stronger connections and relations between the administration, expert groups, and community and serve as “ongoing conversation prompts” (Bailey & Mahutonga, 2021, p. 3).

Civic participation is also observed in implementing risk reduction actions. Community groups take up activities that are solely risk focused (i.e. working on addressing the apparent risk factors) or multi-issue focused (i.e. focusing on environmental stressors, addressing underlying issues by working on community development etc.) (McEwen et al., 2018).

Risk focused groups typically undertake preparedness and mitigation actions. For example, flood groups that work on reducing impacts of floods by improving preparedness, flood monitoring, establishing and maintaining early warning systems etc. (Garvey & Paavola, 2022). Community wide preparedness activities include collaboratively developing community response plans¹⁶, organizing evacuation drills, first-aid skills training and maintaining dedicated facility stocked with supplies (like food, equipment, blankets etc.) that can serve as emergency response hubs in case of emergency (Antonientte Mitchell et al., 2010; Orchiston, 2013; Que et al., 2022). For example, in New Zealand, in Fox Glacier, community leaders have established an Emergency Response Plan (ERP) that outlines how to support residents and tourists in case of emergencies, have organized drills and are maintaining the local hubs (Orchiston, 2013). Such preparedness ensures that residents are self-reliant and can assist each other effectively during emergencies, enhances their ability to cope if the community gets cut off/isolated and minimizes the strain on external resources during significant emergencies (Antonientte Mitchell et al., 2010).

Mitigation efforts involve collaborative actions among various stakeholders to prevent risk creation or reduce the intensity of the hazards. For example, in wildfire prone areas landowners can come together to plan and implement measures like prescribed burns, fuel treatments and strategically placing fire resistant plants to prevent wildfires (Charnley et al., 2020; Sapkota et al., 2015). This involves talking with neighbours about mitigation options, helping neighbours to work on their property, co-ordinating mitigation plans, sharing tools and resources etc. Such involvement of landowners and forest user groups in wildfire preparedness and mitigation is widely observed in countries like the US, Canada, Australia, or Nepal (Bihari & Ryan, 2012; Curtis et al., 2014; McCaffrey, 2015; McFarlane et al., 2011; Sapkota et al., 2015).

Multi-issue focused groups undertake activities that extend beyond the immediate causes of disasters, exploring the complex socio-economic, structural, and environmental factors causing vulnerabilities. It draws from community development perspective and aims to tackle the underlying causes of risk creation by focusing on community-wide capacity building and empowerment (Phibbs et al., 2016).

¹⁶ Community response plans identify hazards facing the community and develop standard operating procedures for response to and recovery from the hazards. It considers a range of potential risks, such as storms, floods, landslides, accidents, and earthquakes and identifies how the community can prepare using local resources and entities like doctors, ham radio operators, pharmacies, community centres etc.

For example, the ‘purok’ approach in Philippines combines traditional community organization with modern strategies, this system empowers citizens by giving them control over their own budget and decision-making and enables them to make holistic plans to reduce vulnerability and exposure, address developmental concerns, and implement disaster preparedness programs that fit their specific needs and geographical context (Curato & Calamba, 2020). Community groups also take up advocacy functions, organize campaigns, rallies, and protests demanding action on hazard risks (Bera, 2019; McEwen et al., 2018; Sharpe, 2020).

Academic focus in New Zealand, however, have been on people’s involvement in knowledge creation and awareness generation and individual preparedness activities (Blake et al., 2017; Dharmasena et al., 2020). Research on community involvement in implementation of risk reduction activities, through collective actions among community members is limited, and “little is known about their impact on community resilience goals” (Williams et al., 2018, p. 2). Thus, the third research question is:

RQ3: What activities are happening through collective actions at the community level and what are their outcomes?

4.3 Methods

A multi case study design was adopted for this research (Creswell, 2007) as it is useful to gain an in-depth understanding of a phenomenon in their real-world context (Guetterman & Fetters, 2018; Stake, 2013).

Groups engaging with emergency management agencies were chosen as the study cases (Mills et al., 2009a). The boundary conditions were defined as: i) community led groups working on DRR; ii) operating at the community, town, or district level, not regional or larger; and iii) presently active in identified locations. The research aimed to study maximum variation cases¹⁷ and identify commonalities across the cases (Creswell, 2007). A two-step process was followed to identify the study groups. First, based on historical disaster data on EM-DAT¹⁸ and Insurance Council of New Zealand and hazard profiles of each region, eight regions, four in North Island (Hawke’s Bay, Bay of Plenty, Wellington, Auckland), and four in South Island (Canterbury, Southland, Otago, West Coast) were identified as regions of interest. Then, officials from CDEM groups, academics, and community leaders were contacted for insights on community participation and collective initiatives in these regions. Eventually, four community groups were selected: 1. Edgecumbe Community Emergency and Response Team, Bay of Plenty; 2. A resident’s group in Mt Cook, Wellington region; 3. Arthur’s Pass Community Response Team, Canterbury and 4. Gore Community Response Group, Southland. These groups work on different hazards (like earthquake, tsunami, flood, landslides, and storms), differ in terms of hazard experiences, operate in diverse geographical and social settings (e.g. rural and urban,

¹⁷ Aims to select cases that represent a wide range of variation across certain key characteristics. By deliberately selecting cases that exhibit maximum variation in characteristics, researchers seek to gain a holistic nuanced view of the phenomenon under investigation and explore how different factors may influence the phenomenon being studied.

¹⁸ EM-DAT, Emergency Events Database, is a global database managed by the Centre for Research on the Epidemiology of Disasters (CRED) that tracks disasters.

stable population vs moving population), and represent different organizational forms (with respect to formation, and degree of formalization) making them ideal for cross case analysis (Figure 4.1).

Criterion sampling was used to recruit interview participants (Palinkas et al., 2015a). Emergency management officials, representatives of non-governmental agencies, leaders and volunteers of the community groups, and information-rich community members who were i) working with communities, and ii) engaged in DRR and preparedness actions in the case study regions/locations were recruited. The participant profiles are presented below (Table 1). Between February 2022 and September 2023, thirty-five interviews were conducted using an interview guide featuring open-ended questions. Additionally, three follow-up interviews were carried out to address any ambiguities identified during preliminary data analysis. The interview questions aimed to gain insights into how the groups were established, understand their form, and structure, and identify the factors that facilitated or hindered their development, as well as the outcomes they achieved. The first author also attended six meetings of the study groups as a non-participant observer, collected documents like newsletters and reports, and maintained field notes (Ostrower, 1998).

Interviews were transcribed in Microsoft word and loaded in NVivo for thematic analysis (Braun and Clarke, 2013). The transcripts were read multiple times to become familiar with the data. Structural coding was done where codes were manually assigned to a set of sentences that contained data related to the topics of inquiry. Then concept coding and in vivo coding was done (Wertz, 2014). The codes were then condensed to identify the candidate themes. An iterative process followed where the coded data and the candidate themes were reviewed and revised to make sure the final set of themes captured the meaning of the data, were coherent and answered the research questions (Bryman, 2016). The themes were also reviewed against fieldnotes and documents for data triangulation (Creswell, 2007). Member checks with the participants were done to make sure the themes were credible and relevant (Creswell, 2007).

Prior to the interviews, participants were provided with an explanation of the study's purpose and expected outcomes, and consent was obtained in an online form. Identifying information were removed during the transcription of the interviews and data was stored in a password protected folder. Ethical approval for the research was obtained from Massey University and due process was followed to maintain ethical standards prescribed by the university.



Figure 4.1 – Map of four study sites with demographic and hazard profile.

In Edgecumbe (1), Arthur's Pass Village (3), and Gore (4) the study groups are local community response teams. In Mt Cook the group is a residents' association. (Map created using SnazzyMaps - <https://snazzymaps.com/>)

Interviews participants			
Area	Profile	No. of participants	Code
Bay of Plenty	Volunteer in community emergency response team	4	BoP_V1 to BoP_V4
	Emergency management (CDEM) official	1	BoP_EM1
	Official from district council	2	BoP_EM2 & BoP_EM3
	NGO personnel assisting in emergency management	2	BoP_N1 & BoP_N2

Wellington	Volunteer in community group working on emergency management	5	W_V1 to W_V5
	Emergency management (CDEM) official	4	W_EM1 to W_EM4
Canterbury	Volunteer in community emergency response team	8	C_V1 to C_V8
	Emergency management (CDEM) official	1	C_EM1
	Official from district council	1	C_EM2
Southland	Volunteer in community emergency response team	6	S_V1 to S_V6
	Emergency management (CDEM) official	1	S_EM1
Total		35	

Table 4.1 – Participant profiles, and the identify codes used herein.

4.4 Study Groups

4.4.1 Edgumbe Community Emergency and Response Team

Edgumbe township is located on the Rangitaiki flood plains, Bay of Plenty (Figure 4.2). On April 6th, 2017, the stop bank on the Rangitaiki River in Edgumbe broke, flooding the township (Glassey et al., 2023). As the response and recovery process unfolded, multiple community meetings were held and by mid-2018, the Edgumbe Collective was formed to guide the community's transition from recovery to long-term development. This collective included representatives from community groups and service providers like Whakatane Neighbourhood Support, Blue Light (organization to support young people), etc. and was assisted by the council-appointed coordinator. The collective developed the Edgumbe Community Plan. One of the aspirations outlined in the Community Plan was strengthening community resilience by developing a community-oriented evacuation plan, identifying, and bringing responding agencies and community representatives together and improving the overall preparedness of community members. To work on these, the need to form a group was felt and in mid-2021 a community *hui* (meeting) was organized. A notice inviting community members and different agencies like included schools, fire brigade, neighbourhood support, prominent businesses etc. was circulated.

Approximately twenty representatives joined the meeting and deliberated on community's needs during the flood, what they desired to have in place before the next potential hazard strikes, and how to attain community self-sufficiency given the delay in receiving official assistance during the Edgumbe flood. The group continued meeting over the first few months, before diminishing in size eventually consolidating into the current group of around eight members who constitute the Edgumbe Community Emergency and Response Team (E-CERT).



Figure 4.2 – Snapshots from Edgecumbe.
College road (left), floodwall reconstruction site (right).

4.4.2 Residents' group in Mount Cook, Wellington

The Mt Cook group formed in 2007 as a residents' group for Mt Cook neighbourhood in Wellington (Figure 4.3) in response to two development proposals that raised concerns among the community. One involved the construction of a supermarket in the neighbourhood which would have caused traffic and congestion on the roads of the suburb that were ill-equipped to handle heavy vehicular movement. The other proposal aimed to route State Highway One through the Pukeahu National War Memorial Park which was very close to Mount Cook School and posed risks to the health and safety of children. These concerns prompted the community to organize a public meeting, which sparked the formation of the group as a citizen collective to address these issues and represent the suburb's interests. The group was successful in its efforts and continued as a resident's group, engaging in various activities like organizing the annual "Spring Fling" picnic and maintaining a gardening group.

During the regular group meetings, the members noticed that topics related to emergency preparedness, resilience, and community well-being became common themes, leading to their interest in disaster preparedness. They discussed ideas such as solar ovens and composting toilets for emergency situations, prompting further exploration of disaster management and resilience planning. In 2012, the community group decided to organize an emergency expo in the school hall, which served as an early contact with civil defence authorities. The group's engagement with emergency preparedness and their collaboration with civil defence authorities grew over time especially considering the seismic activity in the region.



Figure 4.3 – Snapshots from Mt Cook neighbourhood, Wellington.
Tasman Street (left) and board displaying community emergency response practice location (right)

4.4.3 Arthur's Pass Community Response Team

Early civil defence efforts in Arthur's Pass village (Figure 4.4) were led and resourced by the Department of Conservation (DOC) which, at the time, played an emergency management role in Arthur's Pass. However, around 2006, DOC's involvement reduced, and the locals took over civil defence role with some support from the Selwyn District Council. The local involvement diminished in the subsequent years before picking up again from 2012. The district council officials coordinated with the existing preparedness group. While the group initially grappled with defining its role within the broader civil defence structure by 2014, a "Community Response Team" (CRT) consisting of interested and trained community members was formed.

This transition reflects a broader trend in the region, where multiple towns within the Selwyn District Council have established formal CRTs, within the past decade. Following the Christchurch earthquake in 2011-2012, the Selwyn District Council formalized civil defence efforts with an increase in dedicated staff and resources. It focused on involving remote communities in emergency preparedness and fostering a robust and interconnected network of communities. Geographic mapping was done to systematically identify different communities, particularly the remote ones that can get isolated and need self-sufficiency. Engagement was initiated with community groups and interested individuals to identify people interested in creating a voluntary emergency management team within their area. Through the process, 32 CRTs were formed across the district. As the CRTs formed, they were provided information about emergency protocols and assisted in setting up processes for initial actions during emergencies. The CRTs now serve as a link between the community and the broader emergency management framework to ensure effective coordination and response in times of crisis.

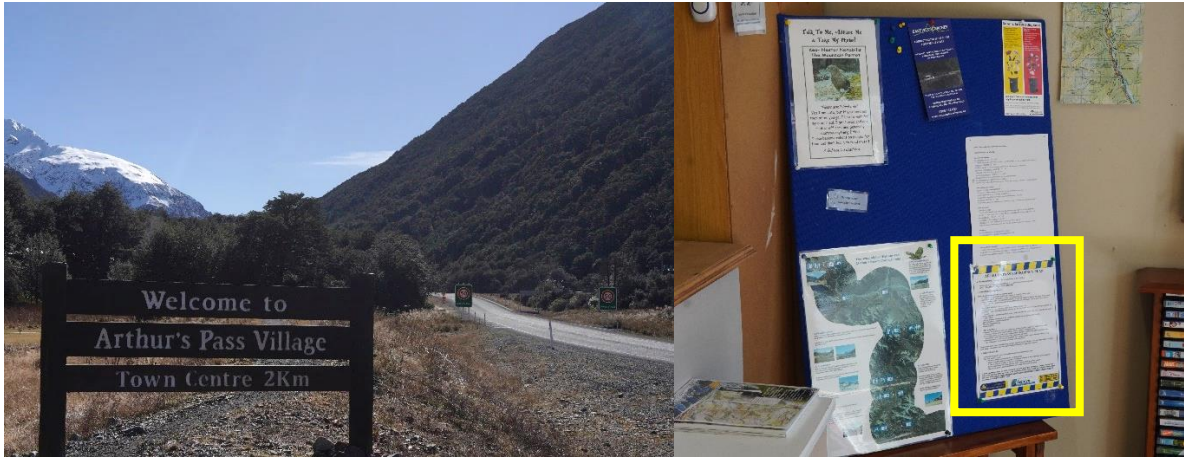


Figure 4.4 – Snapshots from Arthur’s Pass Village.

Road leading to Arthur’s Pass village (left) and Information board at a motel displaying emergency preparedness information and guidelines to follow in case of emergency (bottom right)

4.4.4 Gore Community Response Group

In 2018, the disaster management authority in Southland, Emergency Management Southland, adopted a systematic approach to form community response groups across the region and ensure each group had their own community response plans¹⁹. One of the twenty-six groups formed out of this process is the Gore Community Response Group (CRG) which was formed from an existing church group (Figure 4.5).

Prior to 2018, sector coordinators from different communities engaged with emergency management agencies. The formation of the CRGs involved connecting with the coordinators and engaging with local stakeholders, such as store owners and clubs, to identify interested participants. Community-wide meetings were organized to discuss about the new approach, brainstorm on local concerns, and develop tailored response plans. Depending on the presence of local associations and networks, in some areas, like Gore and Invercargill, groups based on interest groups like churches and sports clubs were formed, while in other areas, geographical groups were formed.

The church premises also serve as the community emergency hub for Gore. It acts as the gathering place for the community in an emergency - that members can evacuate to, access welfare support from, and use as a meeting point to decide on actions to ensure the safety and well-being of the community. In 2020, when a state of emergency was declared in Southland, the response group opened and operated the Gore hub to support the initial response and shelter the evacuated.

¹⁹ While the precise reason for this is unclear, it is a likely outcome of the goals laid out in the Southland civil defence emergency management group plan, 2017-2022 ([2017-southland-group-plan-update-2019-1.pdf \(cdsouthland.nz\)](https://www.cdsouthland.nz/2017-southland-group-plan-update-2019-1.pdf)) that focuses on increasing community engagement and empowering communities to respond to emergencies. The rural nature of Southland, isolated communities and communication challenges, necessitated a focus self-sufficiency and the need to develop a grassroots network of response groups.



Figure 4.5 - Snapshots from Gore.
Gore city centre (left) and Matura riverbank (right)

4.5 Findings

The findings are organized in three sections: 1) nature and form of civic participation in DRR at the community level; 2) emergence of the community groups, facilitators and barriers; and 3) the activities and outcomes.

4.5.1 Nature and form of civic participation and collective action in DRR

Figure 4.6 below shows four avenues through which community members participate in emergency management activities. At the lowest scale, individuals and families engage in DRR by adopting individual actions like identifying an evacuation route, keeping a grab bag ready etc.

Collective action by communities, in the most informal form, sits with key community stakeholders, like community groups, associations and organizations, community leaders and influencers. In emergencies, communities often self-organize, mobilize resources based on emergent needs, and try to restore the well-being of their communities by tapping into the existing social networks (Ozanne & Ozanne, 2016; Vallance, 2015). Key community stakeholders like local groups, and leaders play an integral role in this process. Due to their extensive local knowledge, community connections, and trust within communities, they can quickly tap into their existing social networks, gain information on community needs, connect affected people with support providers, lead spontaneous volunteers and guide initial response (Ozanne & Ozanne, 2016). Recognizing this, emergency management agencies are increasingly engaging with these stakeholders in the pre-disaster stage to form working relationships. Capacity building activities are organized for the stakeholders, in the form of trainings, workshops, scenario-based exercises etc. to discuss various response scenarios and how these groups might work with emergency management agencies to deliver initial support in their communities (W_EM4). Community emergency hubs approach adopted in Wellington provides a formal model to integrate this form of community participation in emergency management process (Wellington Region Emergency Management Office, 2024a). The groups, however, are not focused solely on emergency management and largely function as interest groups (W_V2). The resident's association in Wellington is an example of this form.

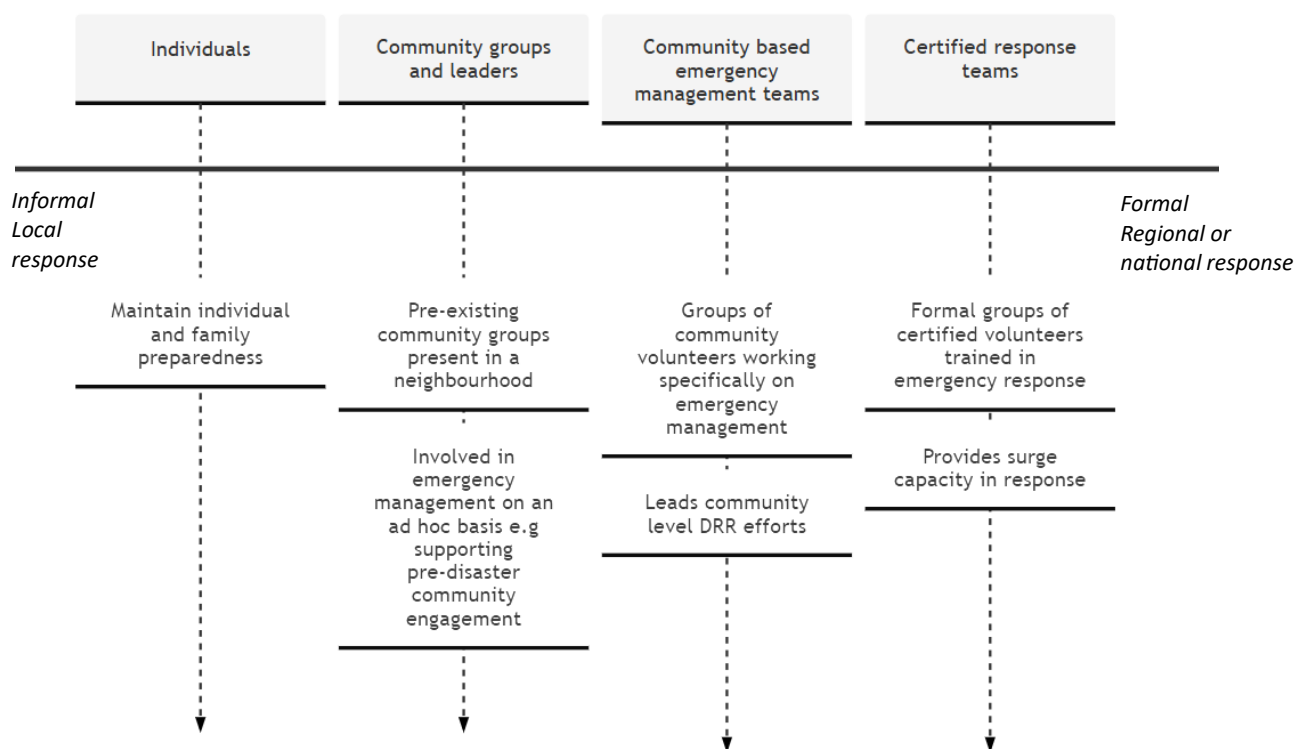


Figure 4.6 – Forms of civic participation in DRR actions at the community level in New Zealand

The figure shows the spectrum of civic participation in DRR actions. People’s participation spans from personal actions to enhance individual preparedness, to collective efforts that range from informal, ad-hoc activities to improve neighbourhood preparedness to formalized roles, such as serving as certified emergency response volunteers.

Community emergency response teams, also known as community response groups, emergency support volunteers, are community-based volunteer groups that form specifically for emergency management purposes (Selwyn District Council, 2024b). These groups engage in improving the preparedness in their areas by assessing local needs and self-assigning tasks as per their capabilities. They work closely with emergency management agencies and actively collaborate with different stakeholders, organize community level awareness programmes and events, maintain community level response resources, and undertake capacity building activities to improve their response capacity. Such groups generally comprise of volunteers representing diverse stakeholder groups, like school board members, FENZ²⁰ and St. Johns²¹ volunteers, representatives from NGOs, religious organizations, and have more visible structure compared to the interest groups discussed above. However, community emergency response teams are not formalized entities. While they typically are the first responders during local emergencies, the decision to deploy and undertake response activities rests with the group. The response team in Edgumbe and Gore represent this category.

²⁰ FENZ, Fire and Emergency New Zealand – firefighting and emergency service

²¹ St Johns – Ambulance service

NZ-RTs, or New Zealand Response Teams, are nationally accredited volunteer units capable of undertaking specialized response activities, like light rescue, hazard specific response, cordon and traffic management, welfare functions etc. (National Emergency Management Agency, 2024h) These teams comprise of trained volunteers, are formally recognized entities and are owned by councils or non-governmental agencies. They are deployed by lead agencies during emergencies, including to other areas in the country to provide surge support in large-scale emergencies. They are governed by the Health and Safety at Work Act, 2015. The CDEM Act of 2002, however, does not explicitly outline the duties and obligations of local authorities towards volunteers, it only includes provisions that allow CDEM groups to recruit, train, and support volunteers (Robertson, 2003). The response team from Selwyn (NZRT-21), Canterbury fall under this form. In addition to these groups, specialized volunteer response teams of Red Cross, Search and Rescue agencies (like LandSAR), FENZ and others also exist.

However, we were unable to find other forms of collective actions, like community groups working with emergency management agencies to mitigate local hazards, address environmental stressors that create risks, or conflictual collective action in the form of rallies or protests.

4.5.2 Facilitators of civic participation and collective action in DRR

Aligning with existing literature, the findings from Edgecumbe demonstrate that communities with hazard experience are more likely to self-organize for reducing disaster risks (Bera, 2019; Que et al., 2022; Sapkota et al., 2015). The experience of the 2017 floods and the dissatisfaction with the official emergency response catalysed the formation of the E-CERT team.

“We've well learned our lesson in a couple of really major events now that it takes time for the officials to get here... So, we know now that we have to be self-sufficient in ourselves for a number of days.” – BoP_V1

The participants, however, emphasized that having a leader or facilitator with strong community connections and knowledge is important, particularly in the initial stages of such initiatives.

“You need someone or a group or agency that are well connected within a community... because of knowledge or experience, they know which connections or which pathways to go down... that is vital whether you are going to get people on board...” – BoP_EM2

The Mt Cook case suggests that groups can engage in disaster preparedness even without a hazard experience. While the intense media coverage and subsequent public discourse following the Christchurch earthquake, 2011-12, likely heightened the awareness of the earthquake risks, it was the conversations among the group members that triggered the group's active involvement in DRR.

“I think it's just one of those things we talked about. That was like 5 years into the group. So, by that stage we were having a community picnic once a year, the gardening group had started... When we were talking in our meetings, we were ‘so well, what else should we be doing?’ And that was one of the things that came up.” – W_V1

Ease of access to information, knowledge and training sustained the group's involvement. The local councillors connected the Mt Cook group with Wellington Regional Emergency Management Office (WREMO) which was already engaging with multiple communities in the region.

"We probably went through one of our city councillors. We're really lucky that over the years the councillors have been really good at being involved. You know, coming to our meetings and helping us with things." – W_V2

Additionally, the Mt Cook group is part of a network of community groups in South Wellington. This network includes groups already collaborating with WREMO, like the Island Bay community group. Social learning from the neighbouring community group, especially regarding how collaboration between emergency management agencies and community groups should operate, what specific actions they can undertake, and what successful outcomes look like, inspired, and supported the group's involvement. This highlights the importance of community conversations, social learning from local associations, and supportive institutional structures in facilitating collective actions on DRR.

On the other hand, the findings from Arthur's Pass, show that possessing hazard awareness and experiences are not sufficient conditions to trigger collective actions. Arthur's Pass village is situated in the geographically remote alpine region, and experiences heavy rainfall and snowfall, occasionally being cut off from nearby cities. There is a culture of self-reliance and an awareness on the need to be self-sufficient for extended periods of isolation. However, even with an existing preparedness group, the proactive involvement of the council was required to support and lead the group.

"We would probably be one of the few towns before that actually had a civil defence structure....but there was probably a bit of a downtime after 2006 after DOC left... there wasn't much happening ... from 2014, I think, there were a series of managers who sort of really kicked things into gear for the council...we received a lot more assistance ...that's kind of also pushed us" – C_V1

It is important to understand why some groups struggle to sustain and how the agencies can facilitate the renewal of the groups. Firstly, unlike developmental and environmental concerns, reducing disaster risks are not a priority for many. Additionally, a lack of clarity persists on how disaster risks can be reduced collectively, what actions can be adopted, and the skills and time commitment required in it. In such situations, agency-led initiation of conversations and support to groups holds value,

"Without casting sort of any judgment, I think that's just the pros and cons of different processes... in a way that model is not as fitting to all members of the community but somewhere that it makes it really accessible to some... You know the consistency in process and the clarity on a very, very clear structure does enable some parts of the community all the time to be quite clear on how to engage with it." – C_EM1

Secondly, bureaucracy and conflicting priorities of different governmental agencies often places roadblocks in civic participation and collective action. For example, a community member from a flood prone area noted that remedial works like clearing river flood ways could not be undertaken as they conflict environmental conservation regulations protecting natural habitat of an endangered fish

species. In such cases, it becomes imperative for government agencies to intervene and establish frameworks for collaborative decision-making and action that ensures a balance is maintained between environmental conservation and meeting community needs. Without such measures, grassroots efforts on preparedness will yield little impact, leading to frustration and waning community participation. One participant voices that “in each community there will be a small group (willing to engage in community work)... when it (community work) falls on the shoulder of a few, the few needs to be supported” (C_V8).

Thirdly, while communities should be empowered to take care of themselves, that should not imply a transfer of responsibility. Organic, and emergent community driven initiatives require support from emergency management agencies for technical knowledge transfer, skill development and provision of resources. This requires equal partnership, in the absence of which community driven initiatives crumble. Citing the example of a community group that could not sustain, a participant notes that

“(Emergency management agencies think) what you needed really was some drivers some leaders within the communities, and then the agencies wouldn't be required to do the work... they could just motivate community representatives to do it for them ... I think that's where it broke down and that it was kind of not a shared responsibility, but rather a transfer or responsibility ... in this very successful case, the woman moved on to other areas and as I understand it hasn't been operating to my knowledge... it's often the leaders of our community are ... busiest and juggling all sorts of different responsibilities. So, my feeling it's not realistic to transfer that model and consider that communities need to look after themselves and it's not an agency responsibility, it must be done in partnership.” - W_V3

The second part of the question was, in situations where it is difficult to form groups or existing groups are disintegrating, how agencies can facilitate civic participation and collective action. Firstly, clarity and honesty on why civic participation is necessary and how that benefits communities is important to secure community buy in. One participant notes that, “You've got to keep your why in front of you.... (it's) going to take time and ... resources and you have to actually put why we exist here, as a group, collectively, and volunteers” (BoP_EM2). In Arthur's pass, officials highlighted the need for the groups to ensure immediate information was available post emergencies,

“When we (civil defence team) think about the response, how did things go and what can we do to be better off next time... what they recognised was in this major event (we) had no simple way to find out how everyone was doing where, where should they be sending their resources... (so we) identify these are some communities we need to prioritize, and we need to reach out to them proactively.” – C_EM2

Secondly, in all the study groups we found that facilitators play a crucial role. Their knowledge, facilitation skills and relationship building abilities influence the outcomes, particularly in agency-led initiatives. In Selwyn, the co-ordinator for the CRTs is also the co-ordinator for the neighbourhood support and has been working in the area for over ten years. Due to her long association with the communities, she is well connected and trusted. She also possesses rich contextual knowledge which helps in providing locally relevant information and devising solutions that are acceptable and

sustainable. Participants noted that the skills brought by her team significantly improved the way things were happening.

“The level of skill is a lot higher than it used to be...people like C_EM2 and (names another official) and the people who are there are probably much more skilled at how they organize things. So, all of a sudden, this whole network of CRT's all over the district has really taken off ... I personally find a lot of it comes down to the skill of the people doing it...I mean you see difference ... I guess if she wasn't any good at that we probably wouldn't” - C_V3

Thirdly, ensuring that agency-driven programmes are flexible to support local initiatives and emergent solutions is essential to foster mutual respect, goodwill, and trust. Describing their approach to supporting local initiatives, an official mentions,

“We work with them ... by providing, some of the resources... But they also use their own initiatives. One of the members (from a SCRT) has gone to the management there and they have agreed to sponsor the whole team with complete wet weather gear which is huge...we can't give everything always because we can't afford to but we do try to support them as much as we can, and I really love it when they use their own initiative and do something like this.” – C_EM2

Such support demonstrates that the emergency managers are “approachable, very engaging and always been very positive and supportive” (C_V4) and contributes to the community intentions of working collaboratively for reducing disaster risks.

4.5.3 Activities and Outcomes

The groups are involved in preparedness tasks like developing community emergency plans, updating the plans, identifying evacuation centres, establishing protocols for setting up community emergency hubs, preparing contact lists and repository of equipment, maintaining equipment like radio, wet weather gear etc. The groups also assume the duty of opening local emergency centres (e.g. community emergency hubs) in their areas to cater to the emerging needs till specialized services can arrive. They take a leading role in organizing and guiding spontaneous volunteers as observed in Gore. Some groups have taken up their own initiatives to secure support or resources for their communities by reaching out to private agencies, applying for council funding or through other means.

“We identified a number of things that we felt would be most helpful in those initial first day or two...she managed to see some funding from this organization... the funding came in and so yeah, we've gone and spent a bit of money.” – BoP_V1

Some groups assume advocacy functions as well. For instance, one of the study groups is presently engaging with a housing development agency to ascertain the arrangements for emergency drinking water. The housing agency is constructing affordable multi-level flats. Owing to the small size of the dwellings, the houses have limited space to store the prescribed amount of drinking water for emergencies. The community is advocating on behalf of the residents to ensure that alternative water provisions are considered, or mechanisms are established to address this issue effectively.

“I think water is going to be the big issue... not everyone can store water... the people living in the small apartments have got lots of things going on in their lives... and then pushing them to do these things (storing drinking water)... they don't have the space... (Organization name) is doing these massive housing projects without any thought about emergency water provisions in those houses. That's something we keep lobbying for, to think about supply of water to their tenants in the case of an emergency.... so yeah, when we have an issue, we'll work on that issue to right things up, getting the message out about” – W_V1

The groups also play a crucial role in fostering connections and communication among emergency management agencies and communities. In the pre-disaster stage, the groups act as liaison between emergency management agencies and communities. As the groups are well connected within their communities, their association with emergency management agencies increases the visibility and reach of the agencies and provides them access to a wider network for promoting preparedness, raising awareness of hazards, and sharing hazard warnings and information on recommended action. The group members also connect officials with resourceful people and representatives of vulnerable groups, help in gaining interest of diverse stakeholders and recruit participants willing to volunteer in preparedness activities.

During an emergency, they provide up to date information about the ground conditions to emergency management agencies thus providing them situational awareness. They also communicate official information within their communities. As the volunteers come from within the community, are familiar to community members, and often police vetted, they are trusted. Thus, they serve as the trusted connection between the emergency management agencies and the affected communities.

“We can be here at the district EOC and very quickly and easily find out what is happening throughout the whole district by speaking to the volunteers.... they are our eyes and ears at the street level...our direct link in the communities...” – C_V2

Disasters often generate strong shared intention of strengthening disaster resilience and prompt collective actions. However, as disaster memories fade, the strong sense of solidarity and urge to reduce disaster risks that emerge in the aftermath of an event diminishes, potentially becoming a lost opportunity. The Edgecumbe case demonstrates the role community groups play in preserving hazard memory and ensuring the collective efforts triggered post disasters are sustained. The E-CERT team that emerged in the aftermath of the floods played a crucial role in maintaining a discourse on preparedness in the community and preserving the shared experiences, knowledge and networks that formed in the aftermath of the flooding. It ensured a continuity in efforts towards improving community preparedness.

The groups also contribute to the social capital²² of the communities. By holding regular meetings (*huis*) between community representatives, service providers and the broader community at a physical gathering place, the groups create spaces for community members to connect, share, and engage in discussions, develop a sense of familiarity, trust and belonging and establish relationships. The regular meetings amongst the team members, interactions with external stakeholders, engagement with broader community, achievement of small successes like establishing the evacuation centres by working collaboratively, etc., creates an environment where people feel connected, supported, “and part of something larger than themselves”. One participant from Edgumbe comments,

“We did events to bring community back... We did drop-in centres, talks... making sure we’re all linking with each other... It was really a reconnection of communities.” – BoP_EM2

This contribute to the social fabric of the township, particularly building social capital which is considered as an important element in community resilience (Aldrich & Meyer, 2015; Kyne & Aldrich, 2020). However, it is noteworthy that despite having a strong community presence, most groups find it challenging to connect with every segment of the community. For example, the Mt Cook group possesses a strong network within the residents as also with the councillors, civil defence authorities and other government agencies, however, it struggles to establish connections with certain groups.

“Residents group like this will generally attract the longer term residents of the suburb who generally happen to be old like me, and who own their own house like me, so there are two other types of residents in Mount Cook who we struggle to represent, one is the students who might flat in the place for two or three years... and the other is social housing residents.” – W_V2

The outcomes of pre-disaster civic participation and collective action in contributing to disaster resilience can be visualized in the form of an iceberg (Figure 4.7). On the surface, the visible, tangible, and measurable activities and outcomes can be observed. These include creating response plans, contact list, maintaining equipment etc. However, multiple intangible impacts are also achieved in the process. For example, working together helps in building a sense of community, connections, sense of solidarity, and social capital. These are not distinctly observable and measurable, but extremely important for improving the resilience of a community.

²² Social capital is the shared resource within a group comprising of sets of relationships, networks, interpersonal connections, common norms, values, beliefs, trust, and structures that enable collaboration and joint efforts for the mutual advantage of individuals involved.

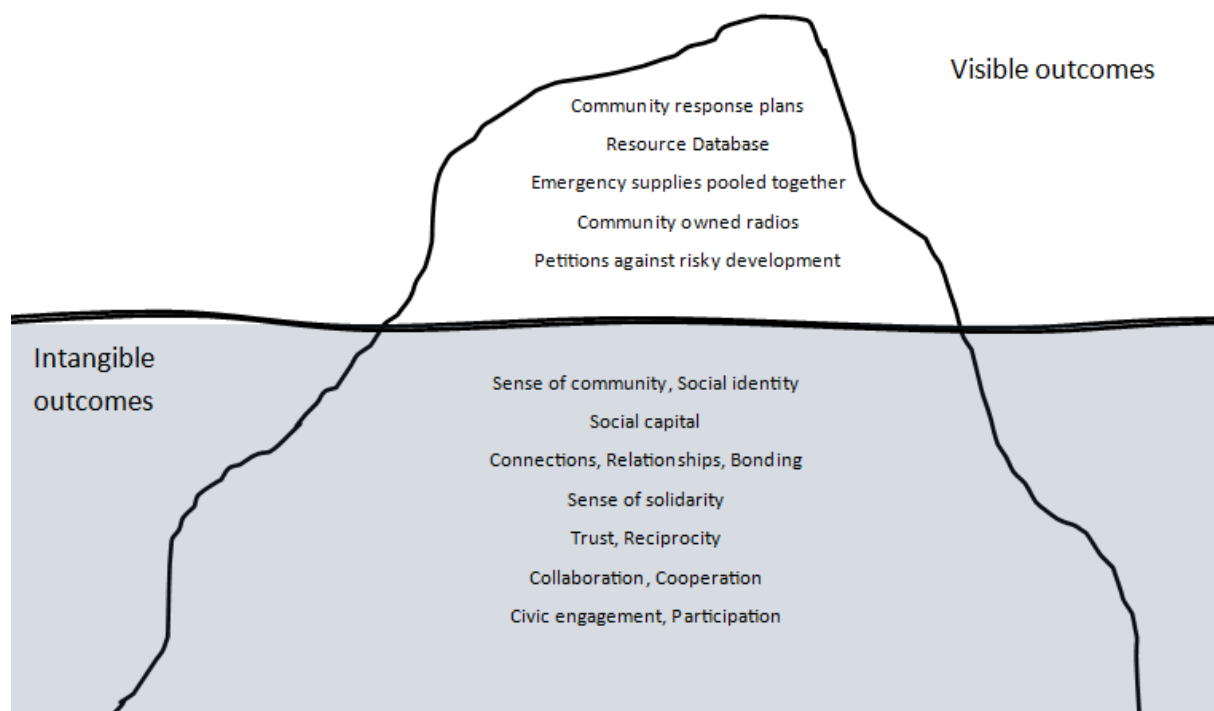


Figure 4.7 – Visualizing the outcomes of collective action in preparedness as an iceberg

4.6 Discussion

Two main factors prompt civic participation in DRR – i) heightened hazard awareness either through hazard experience (Edgecumbe and Arthur’s Pass) or because of public discourse on hazards (Mt Cook) and ii) facilitation by emergency management agencies (Gore and Arthur’s Pass). Having trusted community coordinators with extensive local knowledge was recognized as a crucial facilitating factor for all four groups. The barriers in fostering and sustaining civic participation include a lack of community interest in DRR, bureaucracy, and poor institutional support. The findings show that while hazard awareness is an important factor (Bera, 2019; Que et al., 2022; Sapkota et al., 2015), it does not necessarily trigger community initiated collective action (Gore) or sustain it (Arthur’s Pass). The findings also indicate that with an enabling environment community actions can be triggered by external agencies as well (Gore) (Obregón & Tufte, 2017).

Collective action through civic participation is observed in three forms in the pre-disaster stage – through existing community groups, community emergency response teams, and certified response volunteer groups. This approach integrates community emergency management groups as well as broader community groups working on developmental issues (like urban development concerns, community health, etc.) in emergency management adopting a broader perspective towards building resilience. The groups engage in preparedness activities, capacity building, advocacy, promote connections and communication, enhance situational awareness, and contribute to strengthening intangible assets such as a sense of community and social capital. By working collaboratively, community groups and emergency management agencies establish clear mechanisms for the groups to support emergent needs post disasters. The findings from Gore highlight the importance of such

groups during response and recovery aligning with previous research (Nissen et al., 2021; Ozanne & Ozanne, 2013).

However, there is limited focus on prevention and building long term resilience. We were unable to find groups engaging in emergency management and non-structural mitigation through natural resource management. On the contrary one of our findings highlights conflict between emergency management and environmental priorities. While community groups for maintaining health of rivers, like catchment groups, exist, and are involved in consulting, planning, advocacy, wetland restoration, soil conservation etc. (Auliagisni et al., 2022; NZ Landcare Trust, 2024; Sinner et al., 2022), their role in non-structural mitigation and hazard protection actions for risk reduction remains under recognized, unlike in countries like UK where they are key stakeholders in flood risk management and response (Garvey & Paavola, 2022). Similarly, we were unable to find landowner or forest user groups in New Zealand involved in wildfire mitigation which is observed in many countries (Bihari & Ryan, 2012; McFarlane et al., 2011; Sapkota et al., 2015). It is noteworthy that many people who volunteer in emergency management are also volunteers in Fire and Emergency New Zealand and in natural resource management activities, through DOC, Landcare, and Coastcare. Emergency management and natural resource management are also generally under council responsibility. These factors may help in bringing synergy to the activities happening at the community level in emergency management and natural resource management through informal interactions. However, there is a need to formally recognize the dependencies, integrate related activities, and adopt a holistic perspective on DRR involving both preparedness and mitigation.

There is also a lack of clarity on how existing institutions of the indigenous Māori people are considered within the current approaches of promoting pre-disaster collective actions. During the interviews we found that separate workstreams exist for engaging different groups, including the Māori people, which is valuable. However, it remains unclear how these workstreams operate in synergy with the programmes designed for the mainstream groups and how they enable effective collaboration among different community groups, both before and after an emergency. While informal connections exist in some areas, there is a pressing need for clearer and more formal mechanisms to ensure coordinated and effective risk reduction efforts. Additionally, it is equally important to consider other underrepresented groups and demographics, such as culturally and linguistically diverse communities, socio-economically disadvantaged groups, gender minorities and identify pathways to integrate and collaborate with these groups in DRR processes and decision-making.

Also, it is noteworthy that although, the groups contribute to social capital, even well-connected groups, like the Mt Cook group, struggle to connect with and represent every segment within a neighbourhood. Our findings align with other studies in New Zealand that highlight strong bonding capital does not naturally progress into linking and bridging capital²³ (Trần & Blake, 2024; Uekusa,

²³ Bonding capital - Connections between groups similar in their composition and values.; Bridging capital - Connections between groups dissimilar in their composition and values; and Linking capital - Connections across power structures. Kyne, D., & Aldrich, D. P. (2020). Capturing bonding, bridging, and linking social capital through publicly available data. *Risk, Hazards & Crisis in Public Policy*, 11(1), 61-86.

2020). This underscores that government agencies still need to actively work with a variety of partners even in the same suburb to cater to different groups, perspectives, and needs, particularly to reach marginalized groups, as such groups continue to remain under-represented in participatory processes (Amore et al., 2017; Garcés-Ozanne et al., 2022; Stark & Taylor, 2014; Uekusa et al., 2022).

To address these gaps, emergency management agencies need to adopt a holistic lens moving away from the narrow response centric focus. It is essential to recognize the linkages of emergency management with other sectors and make institutional provisions that enable integrated, cross-organizational collaboration. It is also important to include broader functions within the role definition of local emergency management groups, provide adequate staff and conduct capacity building activities as well as ensure community groups are supported to engage in addressing problems that concern them, including contentious developmental issues and adopt corrective actions at both policy level and implementation level (Vallance, 2015).

A broader concern lies in the fact that community participation, collective action and the concept of resilience could be exploited to transfer responsibility to communities with the “desire to cut costs and ‘pass the buck’ onto citizens” (Rogers, 2015, p. 67), instead of true partnership. Though the community might be involved in meetings, advisory committees or consultation groups through seemingly community engaged participatory processes, they would possess no real power to influence the decisions. Such participation is depoliticized lacking power to address structural problems (Amore et al., 2017; Ryan et al., 2022; Uekusa & Cretney, 2022), “exemplify, at best, passive collaboration, at worst, manipulative consultation done only to help advance a predetermined objective” (Huesca, 2008, p. 187) and reinforces settler-colonial dynamics by favouring institutions, ideas and narratives of those in power (Cretney, 2018; Ryan et al., 2022). This calls for a nuanced understanding of civic participation from the lens of decision-making power reflecting on who is actually making the decisions by critically examining factors like locus of power, control over decision making processes, mode of intervention, flow of communication etc. (Arnstein, 2019; Hore et al., 2020; Inelmen et al., 2004; Nkombi & Wentink, 2022; Servaes & Servaes, 2021).

Additionally, the findings from Arthur’s Pass highlight that a re-consideration of our understanding of community led and agency driven approach is needed, to identify how these approaches should be adopted in practice, in different contexts with varying socio-economic, cultural, and political dynamics (Irvin & Stansbury, 2004). There is a need for abandoning the coarse agency led - community led binary and examining the different modalities of decision-making in participatory processes – on what decisions community input is sought, in what ways the inputs are sought, do people need to go through bureaucratic processes to provide inputs, is community input only a consideration or a deciding factor in the decision-making process?

The idea of communities also needs to evolve beyond the simplistic understanding of communities as stable cohesive units connected by collaborative networks ready to work together. Rather, it should consider communities as spaces of contestation as well where competing demands, conflicts of interest, and negotiation among different groups of people are common (Curato & Calamba, 2020; Lederman, 2019). It is this dynamic of collaboration and contestations that determines how social capital evolves in the community and whether the community can self-organize (or can be organized) to act collectively. It is also crucial to recognize that all collective actions for DRR are not equal - some

benefit the entire community, while others favour only a few - leading to varying levels of interest, support, and participation. Collective action literature acknowledges this difference and distinguishes between collective action as conversionary (e.g. in environmental action where the focus is not to elevate the status of the in-group members, but rather to convince out-group members to subscribe to the in-group's worldview and transforming the out-group into the in-group (Bamberg et al., 2015)) or competitive/conflictual (e.g. in social protests and movements where the in-group members²⁴ are trying to elevate their status as compared to the out-group members (Wright, 2009)). Adopting a similar lens in DRR, distinguishing the types of action, rather than assuming all collective actions are universally supported, can help develop more effective policies and practices.

This paper explores the concept of civic participation and collective action in DRR. Currently, the term refers to a wide array of concepts which causes ambiguity - to the extent that the concept loses relevance. To address this issue, we organize the forms of participation by examining the degree of formalization and organization. We hope that this will help in avoiding ambiguities and help in identifying appropriate policy and programmes to promote civic participation in DRR. Future research can explore each of these forms in details, examining which forms are suitable in which context. Our study only includes four groups, identified through consultations with academics, community leaders, and emergency management organizations. The study would have benefitted from a wider range and number of groups to further refine and improve the insights. Additionally, businesses, critical infrastructure agencies, and other entities are also an integral part of community and future research could explore how these entities contribute to collective emergency preparedness. The paper also identifies some of the factors supporting civic participation and collective action. However, an in-depth study exploring the factors is necessary. Additionally, multiple studies highlight the central role of communication in encouraging civic participation (Colle, 2008; Dagron, 2009). Future research should explore how communication can be leveraged to facilitate these efforts.

4.7 Conclusion

One of the priorities outlined in New Zealand's 2019 National Resilience Strategy is to empower communities to enhance their resilience by promoting collective actions across all sectors of society. In this context, we aimed to understand what collective action means, how it is currently manifesting in New Zealand, what factors influence it, what activities and outcomes are achieved through it, and how it can be improved.

The findings indicate that collective action in DRR in the country primarily occurs through three avenues: through diverse community groups engaged in various community activities, through informal community emergency response teams focused on emergency management, and through specialized and formalized response teams of community volunteers. These groups undertake prescriptive tasks (like building community response plans, maintaining community resources), improve communication across different stakeholders and contribute to intangible community resources like community connections and social capital. and communication among different stakeholders, and the community. Factors that support the emergence and sustenance of collective action in DRR include hazard experiences and awareness, community conversations, supportive

²⁴ In group – The group with which an individual identifies and feels a sense of belonging or solidarity.

institutional structures that provide access to technological knowledge, skill development, and resources, the presence of community organizations involved in DRR activities and social learning from them, clarity on the purpose of initiatives and requirements from community members, the presence of skilled facilitators, and ensuring solutions provided by community members receive adequate support.

While the current forms of civic participation are promising, we find that the existing approaches have a narrow, response-centred framing and lack the potential to address broader developmental and environmental concerns that lead to risk creation. The findings also suggest that in certain situations, community-led approaches struggle, and in these cases, the support and leadership of official agencies are crucial to sustain the initiatives. Future research exploring in-depth the factors that influence civic participation and collective action, the role of engagement and communication in supporting such initiatives, targeted studies of different community groups and the facilitators and barriers to their participation in collective initiatives, and the evaluation of different approaches and their contributions to reducing disaster risks at the community level would be beneficial.

Chapter guide

Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.		What are we studying?
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study		How are we studying it?
Chapter 4 Civic participation & collective action	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Existing communication practices	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Communication content	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Emerging areas of communication	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Chapter 5 Exploring communication practices that promote community participation and collective action for reducing disaster risks in New Zealand

Background: This chapter presents the second manuscript of the thesis. The previous chapter established what civic participation and collective action in reducing disaster risks in New Zealand imply. Building on that foundation, I was interested in understanding the communication practices that support these community actions. Upon exploring the communication practices currently adopted, I found that most of them are rooted in relational and network-based approaches towards communication. Therefore, I adopt a relational perspective to analyse the communication networks, including the actors and resources embedded in them, that promote civic participation and collective action for disaster risk reduction.

The manuscript is currently published as: Das, M., Becker, J., & Doyle, E. E. (2025). Exploring communication practices that promote community participation and collective action for reducing disaster risks in New Zealand. *Disasters*, 49(4), e12690.

An earlier version of the article was presented at: Das, M., Becker, J., Doyle, E. E. H., & McBride, S. (2024, January). Communication approaches for encouraging civic participation & collective actions in disaster preparedness [Oral Presentation]. The Society for Risk Analysis Australia New Zealand Annual Meeting 2024, Christchurch, New Zealand.

Abstract

Emergency management agencies in New Zealand are increasingly engaging with communities to promote civic participation and collective actions for reducing disaster risks. Utilizing a mixed methods approach, this paper explores the communication practices that support these efforts. The qualitative findings reveal that emergency management agencies, different government organizations, community-based agencies and local people play a key role in the process. Communicative actions supporting people's participation include scoping and relationship building activities, awareness events, promotional activities and community conversations. Based on these findings and guided by the communication infrastructure theory, a conceptual map of the communication networks, resources, and processes adopted to promote people's participation and collective action is presented. The survey results indicate that emergency management agencies are the main communicators promoting people's participation. Interpersonal influence and community conversations are most effective for involving new people. The theoretical and practical implications of the findings are discussed.

Keywords: Communication, community participation, collective action, disaster risk reduction, disaster preparedness, communication infrastructure theory

5.1 Introduction

After a natural hazard, like an earthquake, it is the people in the local community that mobilizes to search for survivors, provide first aid to the injured, and offer food and shelter to the affected, before specialized teams of emergency management personnel arrive. This is observed after most disasters like the 2011 Christchurch earthquake (Potter, Becker, et al., 2015), 2015 Nepal earthquake (Devkota et al., 2016), and others. Recognizing this, the guiding principle of contemporary emergency management practice is on working with community members before an event to identify people and

elements at risk of hazards, promote protective and preventive measures, upskill people, and strategically position resources to ensure people's safety and quick response after an event (Kruger et al., 2018; Ministry of Civil Defence & Emergency Management, 2019).

The initial and widely employed approach towards preparing our communities has been on motivating people to adopt individual or family level actions that minimize hazard impacts. Such actions include awareness of hazard risks, identifying evacuation routes, adoption of protective behaviours, obtaining hazard insurances, maintaining emergency kits, storing additional supplies for emergencies, etc. (Becker, Paton, Johnston, et al., 2013; Ning et al., 2021).

However, contemporary research recognizes that individual and family-level preparedness are not sufficient to significantly reduce disaster risks (Ireland & Thomalla, 2011). It is crucial for "communities, and not simply individual households", to come together, mobilize resources and engage with diverse stakeholders (Uscher-Pines et al., 2013, p. S70). Communities should participate in decision-making processes on disaster readiness and act collectively to develop capacities and capabilities (Zivari et al., 2019). While such civic participation and collective action may or may not directly benefit individuals, altogether, they decrease exposure, minimize vulnerability (Rivera et al., 2015), and enhance capacity at the community level (Andrew et al., 2020; Bera, 2019; Garvey & Paavola, 2022; Sapkota et al., 2015).

This raises the question – how do we encourage civic participation, and collective actions in disaster preparedness? Studies in different disciplines indicate that communication²⁵ has immense potential to promote civic participation, and collective actions. e.g. Damtew et al. (2021) in natural resource management, Klavina and van Zomeren (2020) in sociology and political science Dasgupta (2019) in public health. In the disaster context, communication helps in building risk knowledge, generates collective awareness (Ireland & Thomalla, 2011), supports sharing of actionable information and mobilizing resources to address the collective challenges faced by the group (Nah et al., 2021) – thus being instrumental in promoting civic participation and collective action

However, we find that communication research within disaster studies primarily focuses on the communication strategies to encourage individual preparedness, overlooking its role in promoting collective actions. Little systematic knowledge exists on how different communication initiatives influence members' involvement in collective actions for disaster preparedness, which communication approaches are beneficial, and what additional supports beyond communication may be required (Ryan et al., 2020). While there is potential for the use of communication to encourage civic participation and collective actions, how communication can be best utilized remains less understood (Burnside-Lawry et al., 2013). In this context, the paper aims to examine how communication is currently used to promote civic participation and collective action and explores how they can be improved.

²⁵ Defined in section 2.1.

5.2 Literature review

5.2.1 Collective action and civic participation in disaster preparedness:

Collective action, in the pre-disaster stage, refers to the act of people coming together to identify hazards, collectively taking decisions on the best way to address hazards, engaging with diverse stakeholders, mobilizing resources, and building capacities and capabilities to withstand the effects of the hazards with minimal disruption (Bera, 2019; Ireland & Thomalla, 2011). For example, in wildfire prone areas, landowners sharing a property boundary can collaborate with each other and organize prescribed burns to mitigate the risk of wildfires (Charnley et al., 2020; Sapkota et al., 2015).

The idea of collective action is also embedded in community resilience (Coles & Buckle, 2004; Kwok et al., 2016; Patel et al., 2017). Community resilience refers to the collective ability of communities to anticipate, respond to, and recover from disruptions, caused by disasters while maintaining essential functions and preserving community well-being (Mayer, 2019). Community resilience emerges as community members acquire hazard awareness, critically reflect on their awareness and knowledge, constructively engage in group processes and collaboratively solve problems through decision making and collective action (Norris et al., 2008). Thus, collective action is one of the elements fostering community resilience as it enables people to collectively address hazard risks empowering them to navigate and overcome adversity – it is an integral element of community resilience.

Closely linked to collective action is civic participation. Civic participation refers to people's active involvement in the processes and activities of community life that improve community well-being (Arnstein, 1969). Six groups of activities are considered as forms of civic participation - association participation, giving behaviour, volunteering, environment-friendly pro-social behaviours, political and pro-social behaviours, and supporting-helping individuals (Cnaan & Park, 2016). In the context of disasters, people participating in community consultations (Antonientte Mitchell et al., 2010), organizing rallies and protests to demand hazard mitigation (Bera, 2019), volunteering in disaster preparedness committees can be considered as forms of civic participation. It is obvious that without civic participation, there is no collective action.

5.2.2 Communication and collective action

Communication refers to the social interaction among actors through symbols and message systems (Gerbner, 1966). It encompasses all formal (meetings, official memos etc.) and informal processes (casual conversations) occurring at various levels with different flows of information (vertically up or down the hierarchy, horizontally between group members, or diagonally across levels and functions) that facilitate information sharing, defining and negotiating interests, shaping behaviours, and influencing actions (Mansell & Raboy, 2011).

5.2.2.1 *Preparedness communication*

Early communication research in disaster preparedness was guided by the information deficit model which presumed that people are less prepared because of lack of knowledge and 'incorrect' risk perceptions (Balog-Way et al., 2020; Wood et al., 2012). The focus was on informing the public about hazard risks with better scientific and factual information to 'correct' the understanding of risk and promote 'rational' responses from the public in the form of improved disaster preparedness behaviour

(Abunyawah et al., 2020; Bradford & O'Sullivan, 2011). Over the following decades, preparedness communication has expanded to include persuasive and participatory approaches towards communication.

The emphasis in persuasive approaches is not solely to provide clear intelligible risk information (normative), rather it is to influence attitudes and behaviours of others towards the hazard through the communication processes (Wardman, 2008) by varying source, message, receiver, and channel (SMRC) characteristics (Breakwell, 2000). For example, multiple studies have identified that messages invoking social norms can shape attitudes towards disaster preparedness (Seyranian et al., 2015; Solberg et al., 2010; Vinnell et al., 2019).

While persuasive communication was somewhat successful, a growing need was felt that participatory approaches to communication that facilitate participation of all stakeholders are essential to improve preparedness outcomes. In participatory approaches, community members are involved in identifying what the risks are, which are to be prioritised for communication and determining the form and process in which risk is communicated (Abunyawah et al., 2020; Sellnow et al., 2008). Participatory approaches can follow the normative path that focus only on providing a better understanding of hazard through the dialogue (e.g. participatory risk mapping) (Demeritt & Nobert, 2014) or, it can follow a persuasive path where risk communicators try to promote certain attitudes, behaviour, and actions through two-way interaction and how the desired end results will be attained is discursively negotiated (Wardman, 2008). For example, using communication to engage with local communities, understand barriers towards protective action, and discursively negotiate options to reduce vulnerability to earthquakes (Musacchio et al., 2017). The change towards participatory approaches was accelerated by the spread of digital media which led to the rise in “participatory culture” where knowledge is generated, distributed and evaluated in new ways (Delwiche & Henderson, 2012). To encourage people’s participation, conventional communication techniques like meetings, workshops, storytelling (Ryan et al., 2020) as well as communication facilitated by digital media (through social networking platforms, citizen science approaches, virtual reality tools) are used (Basak et al., 2020; Tran et al., 2009).

However, involving the public in collective preparedness is challenging because of the time-intensive and demanding nature of participatory communication and preparedness processes (Antoniette Mitchell et al., 2010; Wu et al., 2016). Meaningful interaction with the public through two-way risk communication processes and the establishment of trust and relationship is necessary to foster citizen participation (Balog-Way et al., 2020). The relational model of communication recognizes this and aims to improve the quality of the relationship between communicators and leverages on social networks, trusted relationships, interpersonal connections and face to face conversation – the objective is to transform a linear transmission of risk information into a dialogue between equal participants (Lejano et al., 2023). The model also suggests that narrative messages with vivid descriptions which are contextualized to the community experiences and are informed by local knowledge are more likely to be effective (Lejano et al., 2018; Lejano et al., 2021).

While the different models of preparedness communication, particularly the participatory approaches and relational models of communication, have potential to support collective action in disaster preparedness, there is a lack of research exploring it (Burnside-Lawry et al., 2013). Further research in

the ways information and communication “promote more-than-coping responses ... to facilitate collective action” is needed (Elrick-Barr & Smith, 2022, p. 1).

5.2.2.2 *Community resilience and communication*

At about the same time as preparedness communication was evolving, due to a burgeoning interest in community resilience from early 2000s, research in community resilience communication also grew. Though community resilience is closely related to disaster preparedness, the communication research trajectories of both grew separately. Reconciling communication research on community resilience with disaster preparedness research is important, as collective preparedness forms an integral component of community resilience.

Communication research on community resilience have explored mainly two strands – i) developing the conceptual linkages between communication and community resilience and ii) understanding how communicative actions by citizens lead to community resilience in the pre and post disaster stages.

The first strand explores how communication is a core element of almost all community resilience models (Houston, Spialek, et al., 2015; Patel et al., 2017). For example, Norris et al. (2008, p. 136) consider community resilience emerges from four networked resources within a community – “Economic Development, Social Capital, Information and Communication, and Community Competence”. These resources are interlinked and influence each other, i.e. communication can influence the other networked resources, for example, social capital. Social capital enables people to access and utilize resources embedded in one’s social networks to gain information, material, and emotional support that enables them to cope with hazardous events (Meyer, 2018; Putnam, 2000b). Meaningful communication enables people to build connections, maintain social interactions, and forge reciprocal relationships that are key to developing social capital (Norris et al., 2008). Thus, communication influences the way in which people collectivise to improve their readiness to disasters by supporting and developing the strengths within a community. It fosters proactive agency and self-organization by nurturing the connections between individuals, strengthening social networks, providing avenues to share values, beliefs, knowledge, and learning, creating opportunities for collaborative governance and enabling mobilization and better utilization of resources (Berkes & Ross, 2013). Communication for community resilience is not focused solely on sharing accurate information, but it aims to build a communication ecosystem that enables people to discuss their needs and views by maintaining connectedness among community members, establishing strong communication networks, including trusted sources of information in the communication network, engaging in trust building processes, maintaining communication infrastructure, and helps in constructing communal narratives that recognize local experiences, values and practices (Chandra et al., 2011; Norris et al., 2008; Patel et al., 2017).

The second strand in the literature looks at people’s communicative actions²⁶ and how that influences community resilience in both pre and post disaster contexts (Pfefferbaum, Neas, et al., 2013; Spialek & Houston, 2019). For example, Liu (2022) examines how community-level communication resources, such as interpersonal connections and local media storytelling, support multiethnic communities to

²⁶ Various ways in which individuals engage in communication within a societal or civic context, e.g. attending community meetings.

navigate post-disaster recovery, showing better coping outcomes in communities with stronger communication resources and networks. The Communities Advancing Resilience Toolkit (CART), which is an evidence informed intervention designed to assess and foster community resilience, also leverages on communication for problem-solving, promoting resource sharing, directing resources toward community needs in the face of potential threats, and fostering connections (Pfefferbaum, Neas, et al., 2013; Tavares et al., 2023).

5.2.2.3 *Research gap and theoretical framework*

From preparedness and community resilience communication literature, we find that communication can influence civic participation and collective actions for reducing disaster risks (collective preparedness), but a gap exists in our understanding on what form of communication influences it and how it can be improved. This study addresses this research gap.

We use communication infrastructure theory (CIT) to guide the study (Kim & Ball-Rokeach, 2006a). CIT adopts a communicative lens to understand civic participation in neighbourhoods. It draws from communication ecology perspective and conceptualizes the communication systems within a community as networks of communicating actors and resources that people engage with to acquire information, make decisions, and perform routine tasks (Broad et al., 2013). This communication system consists of two components: i) the neighbourhood storytelling network (NSN), and ii) the communication action contexts (CAC). NSN consists of macro (like mainstream media, focusing on broader city, national, or global narratives for a generalized audience), meso (concentrating on specific city sections or communities), or micro level actors (family, friend, and neighbour networks). These actors create and disseminate neighbourhood stories and drive everyday conversations. CAC consists of both tangible and intangible resources in neighbourhood that facilitate communication among residents, like institutional resources, neighbourhood environment, shared histories etc. Guided by the CIT, we wanted to explore the communication infrastructure that supports civic participation and collective action at the community level. Therefore, the first two research questions are:

RQ1: What community communication network (NSN) promotes civic participation and collective action for reducing disaster risks?

RQ2: What community contexts (CAC) support such actions?

We were also interested in understanding the elements in the communication infrastructure that are effective in supporting civic participation. Encouraging new members to participate in collective preparedness is often most difficult as community members are busy and might not have the time, energy, resources, or interest to engage in collective preparedness (Charnley et al., 2020; Antoniette Mitchell et al., 2010). So, we aimed to understand the communicating actors and actions that are most effective to recruit new members. This guided the third research question:

RQ3: What elements in the communication infrastructure are most effective in involving new members in civic participation and collective actions for reducing disaster risks?

5.3 **Methodology**

A mixed methods approach was adopted (Morse, 2010) with qualitative case study and quantitative surveys.

Based on historical disaster data (from EM-DAT and the Insurance Council of New Zealand), hazard profiles of each region, and discussions with Civil Defence Emergency Management (CDEM) officials, representatives from community-based agencies, community leaders, and academics, four community groups, one each from Bay of Plenty (Edgecumbe community response team), Wellington (Mt Cook residents' association), Canterbury (Arthur's Pass community response team, part of the broader Selwyn district response teams), and Southland (Gore community response team) were selected for the study. These groups were selected as they have varying hazard experiences and operate in areas that differ in geographical and social characteristics making them suitable for cross case analysis (Figure 5.1).



Figure 5.1 – Map of study areas.

Snazzy Maps website (<https://snazzymaps.com/>) was used to generate the map.

5.3.1 Qualitative themes

The first author reached out to the leaders and members of the groups requesting an interview. Thirty-five interviews of about one hour were conducted between February 2022 and September 2023 with officials from emergency management agencies, community organization representatives, community members and leaders (Table 5.1). The interview guide contained open ended questions exploring the communication networks, resources and processes, like how do you tell people to prepare together for disasters, what do you say, where and how, etc.

The first author also participated as a non-participant observer²⁷ in six community meetings related to emergency management - community emergency hub training meeting (1), group meetings (4), and an annual training night (1) - and maintained field notes (Ostrower, 1998). Documents like pamphlets, newsletters, posters were collected. The data obtained from these sources were utilized to triangulate the findings from the interview data (Creswell, 2007).

Thematic analysis was conducted (Braun & Clarke, 2012). The interviews were transcribed and loaded in NVivo software for analysis. First structural coding was done to organize the data and then concept codes and in-vivo codes were assigned to the data (Saldaña, 2016). Codes were then condensed to identify the categories and potential themes. An iterative process followed where the codes, categories and themes were reviewed and revised to ensure the themes were coherent and answered the research questions (Bryman, 2016). We also reviewed the themes against the observation notes, and documents for triangulation. Member checks were conducted with the participants to ensure the findings are credible and relevant (Creswell & Poth, 2016).

Interviews			
Area	Profile	No. of participants	Code
Bay of Plenty	Volunteer in collective preparedness	4	BoP_V1 to BoP_V4
	Emergency management (CDEM) official	1	BoP_EM1
	Official from district council	2	BoP_EM2
	NGO personnel assisting in collective preparedness	2	BoP_N1 & BoP_N2
Wellington	Volunteer in collective preparedness	5	W_V1 to W_V5
	Emergency management (CDEM) official	4	W_EM1 to W_EM4
Canterbury	Volunteer in collective preparedness	8	C_V1 to C_V8
	Emergency management (CDEM) official	1	C_EM1
	Official from district council	1	C_EM2
Southland	Volunteer in collective preparedness	6	S_V1 to S_V6
	Emergency management (CDEM) official	1	S_EM1
	<i>Total</i>		35

Table 5.1 – Participant profiles, and identity codes used herein.

5.3.2 Survey results

The survey was conducted between August and November 2023. Survey questionnaires were distributed in both hardcopy and as an online link to the survey hosted in Qualtrics platform. The survey participants included community members from the study areas (Bay of Plenty, Wellington, Canterbury and Southland) who participate or volunteer in collective actions for reducing disaster risks at the community level. A snowball sampling approach was employed, where the surveys were shared with emergency management officials, community-based organization representatives and

²⁷ Non-participant observation involves the process of studying a situation or group without actively participating in the activities being observed (refer Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage publications.

community members from the study areas, who were then asked to share it with other people engaging in collective actions.

In total, 80 participants completed the survey (Table 5.2). Results of two open ended questions from the survey questionnaire are presented in this study: "How did you come to know about the emergency management and preparedness group for which you are currently volunteering?" (communicative action) and "Who informed you about the emergency management and preparedness group for which you are currently volunteering?" (communicating actor). The data entered by participants were reviewed and a coding framework was developed both inductively and deductively. Initial codes were derived from the data (inductive coding) while some were predetermined based on existing literature (deductive coding). Each response was reviewed and assigned a code. For example, the response "Once moving here, the local team leader approached and asked if I wanted to join" to the communicating actor question was coded to "Local people associated with civil defence". The frequency of each code was calculated and reported. The data is presented in section 4.2. An integrated discussion drawing on the qualitative themes and the quantitative results are presented in section 5.

Participant profile (n = 80)	
<i>Gender</i>	
Male	41
Female	37
Undisclosed	2
<i>Age</i>	
18 to 30	3
31 to 45	9
46 to 60	27
60 to 75	37
Above 75	4
<i>Location</i>	
Bay of Plenty	3
Wellington	21
Canterbury	51
Southland	5

Table 5.2 – Demographic profile of survey participants

Ethical approval

The Massey University Ethical Code of Conduct was followed. A Low-Risk Ethics Notification Number of 4000024945 was obtained. Informed consent was secured from the participants. No potentially identifiable images or data are included in this study.

5.4 Understanding the communication practices

5.4.1 Community communication network (NSN)

Four main actors communicate in the pre-disaster stage - i) emergency management (CDEM) agencies, ii) Emergency service agencies and other government organizations or entities supported by the government, iii) non-governmental or community-based agencies, and iv) local people.

Emergency management agencies

Local CDEM groups play a central role in promoting civic participation and collective actions at the community level. Their active presence can be attributed to their mandate as the emergency management agency in the country (Ministry of Civil Defence and Emergency Management, 2002) as well as a general lack of interest in emergency management among local people and community organizations (Becker et al., 2012). With the support of different governmental agencies, NGO/CBOs, community leaders, and local people, emergency management agencies promote civic participation and collective actions using three approaches – i) scoping and relationship building activities, ii) awareness raising events and iii) advertisements and promotions.

Awareness events are structured events held in-person or virtually in the form of meetings, workshops, training nights etc. Depending on a regions' approach towards collective preparedness, the structure and purpose of events, how frequently they are organized, how they are facilitated, the extent to which informal processes are incorporated etc. varies. While an awareness event can be focused solely on collective preparedness; typically, they are combined with broader hazard awareness events that discuss individual preparedness, business continuity and other related topics as well. The following excerpt explains how such events are organized in Selwyn:

“We'd say, we're gonna come out to Leeston... to do an emergency preparedness presentation about the Alpine fault...we would put on supper and invite all the locals and tell them what we're doing, what the impacts of an Alpine fault rupture is likely to be on their community... we'd tell them what they can do now to make their life more comfortable afterwards... And then we would tell them the way community response works and we're looking for more local people. Would anyone be interested? Please come and see us and we'll take questions. And just mill around, always put on supper and a cup of tea. People stay. They have the opportunity to chat... And now they've been presented with the facts of what might happen.... and how they can step up now and do something voluntarily to be involved... it appeals to people.” – C_EM2

Scoping and relationship building activities rely on in-person informal approaches like cold calling, shoulder tapping²⁸, maintaining presence in social events, drop-in sessions etc. They aim at identifying key stakeholders and interested members within a community and establishing trust and collaborative relationships with them. Local leaders and community influencers often are the first point of contact for emergency management officials trying to form or strengthen relationships with a community.

²⁸ Shoulder tapping is an approach to reaching out and inviting individuals to participate in a volunteer initiative. This involves directly approaching and engaging with people, either in person or through communication channels like email or social media requesting them to be a part of the initiative.

“It’s a lot of informal and formal talks with our team and the local community leaders and then of course leveraging off those community leaders. They are members of ... the local schools... they share the news through those channels... Local sports coaches and the residents’ association... And then it was about coordinating and bringing those different residents together...the most effective has always been going to meeting with community leaders and influencers and really meeting the right people.” – W_EM2

Additionally, to connect with interested community members, emergency managers organize “drop-in sessions” or put “stall at a community event” through which “community members come up” to discuss “something that’s on their mind already”; these events provide “an entrance way” and “sometimes develop into a group” around preparedness (C_EM1).

Promotional activities rely on impersonal communication techniques over print (community newsletters, advertisements through letterbox drops etc.) and digital media (website and social media). They encourage collective preparedness activities like creating community emergency plans, staying connected with neighbours, hosting neighbours’ days, volunteering with organizations focused on disaster preparedness etc. (National Emergency Management Agency, 2024b; Selwyn District Council, 2024a; Wellington Region Emergency Management Office, 2024c). They supplement in-person approaches to increase reach and visibility. With the rise of social media, officials are using social media to “inform the community that they’re invited to *huis* (meetings) or projects that are happening” (BoP_EM2) or engage in “discussions online so our team are able to jump online and answer questions” (W_EM2).

As the approach towards collective preparedness in New Zealand is different across different regions in the country, the number of formal events, their purpose, how they are facilitated, the extent to which informal processes are incorporated, use of digital platforms etc. varies across regions. However, most officials found informal interpersonal approaches as more effective than other techniques in generating interest and finding volunteers; hence preferring to use personal connections over mass communication. Highlighting the importance of the informal in-person approaches, an official states,

“(Community engagement) can be a real varied approach ... especially during COVID it was quite challenging ... a lot of the engagement that would normally happen face to face was done over zoom or via e-mail. And I think that really stunted the start of me forming community connections...So I would say a solid 85 to 90 percent of the engagement or relationship building I do is face to face over a cup of coffee and the odd phone call and e-mail scattered in there but where I can very much like to be out and about and see people face to face.” – W_EM4

The communication processes are also highly dependent on the community engagement facilitators’ (also known as community resilience advisor, community resilience co-ordinator) skills, knowledge and relationships within the community and their approach towards community engagement. For example, an official highlights how such approaches have a heavy reliance on their relationship in a community and quotes that she “drew on my own personal networks across the disability spaces... and just anyone I knew pretty much”(W_EM3) while another official shared that “I’m still... figuring out how I can build relationships with some of the underrepresented communities or communities I just don’t necessarily have relationships with.” (W_EM4).

Other government organizations and community-based agencies

Emergency service agencies (like Fire and Emergency New Zealand., St. Johns, NZ Police), select government departments (like public health, primary industries etc.) and community-based non-profit organizations (like residents' associations, Salvation Army, Neighbourhood Support, Federated Farmers, Rural Support Trust etc.) support emergency management agencies with their communication activities. The agencies spread preparedness messages within their networks, connect interested people with emergency management officials and amplify the visibility and reach of disaster and risk communication. For example, a representative from Neighbourhood Support explains that when posting on the NGO's social media page about neighbourhood events, they also include messages on preparedness:

“We have a Neighbourhood Support Facebook page ... we can get to five thousand views with my weekly crime reports ... So, when I do my weekly crime report... that have happened in the last week... I'll put in it... emergency management preparedness or FENZ fire tips as well” – BoP_N1

These organizations also highlight preparedness issues within their neighbourhoods to responsible agencies and work towards resolving them.

Emergency management officials often collaborate with these organizations to identify new volunteers from their networks. It is common to partner with “FENZ and Police and St John” and “encourage their volunteers to come along (to meetings organized by emergency management agencies) because a majority of them are very interested in what we do and how we (can) work together” (S_EM1). As existing community volunteers often have rich local knowledge, community connections, an interest in community concerns, they are often the first points of contact when forming new volunteer teams. A volunteer from FENZ mentions,

“When we first started forming it... it was myself, and two of our station officers here... I was originally set up by (a person from the district council) ...we were pulled in from a fire and emergency point of view.” – BoP_V2

Leveraging existing organizations and networks is particularly important for engaging with hard-to-reach communities. Describing their experience, one participant says that in “new migrant communities or culturally and linguistically diverse communities, identifying either that person in the local council... or ... another social agency that holds the relationship and working through them and with them” is important (C_EM1).

Local people

Local people engage in conversations around collective preparedness in several ways. Local leaders and community influencers often are the first point of contact for officials to identify potential volunteers. The process to establish contacts can extend over a long time and can suffer when the connections cannot be established and maintained.

Local people also disseminate information and knowledge about collective preparedness gained from the above communication streams through informal conversations with family, friends, neighbours and the broader community. They “spread the word” about awareness events organized by emergency management agencies, create interest, “bring along friends” to attend the events. During these events,

they participate in discussions with officials, share their viewpoints, influence the conversations and their outcomes, and then bring the knowledge back to share within their social circles - thereby maintaining a discourse on preparedness. Such community conversations play a crucial role in influencing people's participation in collective preparedness. For example participants from Wellington mentioned that their activities on emergency preparedness started "(as) a realization... as simple as two people talking... you know we've got some water or we haven't got anything ready and it probably just grew from that" (W_V4) and "discussions about them (disaster preparedness) came and went, people added other ideas... (and it) just snowballed really." (W_V2).

As a core team of residents interested in collective preparedness forms, they become advocates of collective preparedness within their communities, promoting conversations on preparedness through "word of mouth" and encouraging others to get involved. Describing how local people take leadership, one official mentions,

"(It is) somebody who takes on that leadership... they might be the Facebook community page driving all that, be the person that organises the coffee group for the new mums, they're just community minded people who are quite active and like to help organise and support things in their community." – C_EM1

A volunteer shares how they feel that they "have a lot of resources around here" in the community and they encourage other residents to engage more and "spring into action" (W_V1). It is noteworthy that officials from emergency management, government entities and CBOs/NGOs are also members of their local community. They champion preparedness conversations within their personal networks, even when not in their official role. A volunteer, now in charge of the local CRT team, shared how, when she moved to a new area, her neighbour, who was already part of the local CRT team, visited her. During their conversation, the topic moved to local hazards at which point the neighbour asked if she would like to join the group which marked the beginning of her involvement with the team. Digital platforms like "community Facebook page" are also used to generate awareness by posting "that they (local community response team) were seeking volunteers". The tacit and experiential knowledge of local volunteers help them in suitably adapting their messages and communication techniques to the local context. For example, a volunteer explains that their initial plan was to share the community response plan at a local event, such as Christmas in the park, by setting up a stall to talk with residents directly, but "COVID kept making it really hard" and "we just decided we're gonna put in the mailbox" (BoP_V1).

Even people who are not associated with collective preparedness, in their interpersonal conversations or in social events, share information on the preparedness groups and connect interested people with the contact persons. For example, one volunteer came to know about the preparedness groups from "word of mouth" and then by "meeting existing members from the civil defence effort" they got involved, while another member "talked to people and got asked to join because of my skills and training".

Figure 5.2 below maps the communication network along with the actors and the communicative actions. The upper part of the figure shows the organizations communicating about collective preparedness at the community level and the communicative actions they adopt. The lower part shows a hypothetical community with each point representing a person within the community with

existing networks denoted by lines (like the network of a community leader) and groups shown in circle (like resident's association, sports groups etc.).

As organizations engage in collective preparedness communication within the community, they establish connections with interested community members (like a community leader, sports group and resident's association). These connections serve as a bridge between official agencies and communities triggering ongoing conversations and collaborative decisions on issues of disaster risks and actions to reduce them. The conversations are re-shared in the community networks. The process helps in enhancing the disaster knowledge and fostering relationships between community members and organizations that can aid in securing support and resources during an emergency. However, it is noteworthy that not everyone is connected to the community communication networks (e.g. the bigger black dots in the figure) and they might struggle to participate in conversations or access resources shared through these networks.

In some cases, community emergency response teams form through this process. They lead community level disaster preparedness efforts working closely with official agencies, undergoing training and engaging in more tangible actions for reducing disaster risks (like preparing community evacuation plans, organizing evacuation drills, operating emergency hubs during hazardous events).

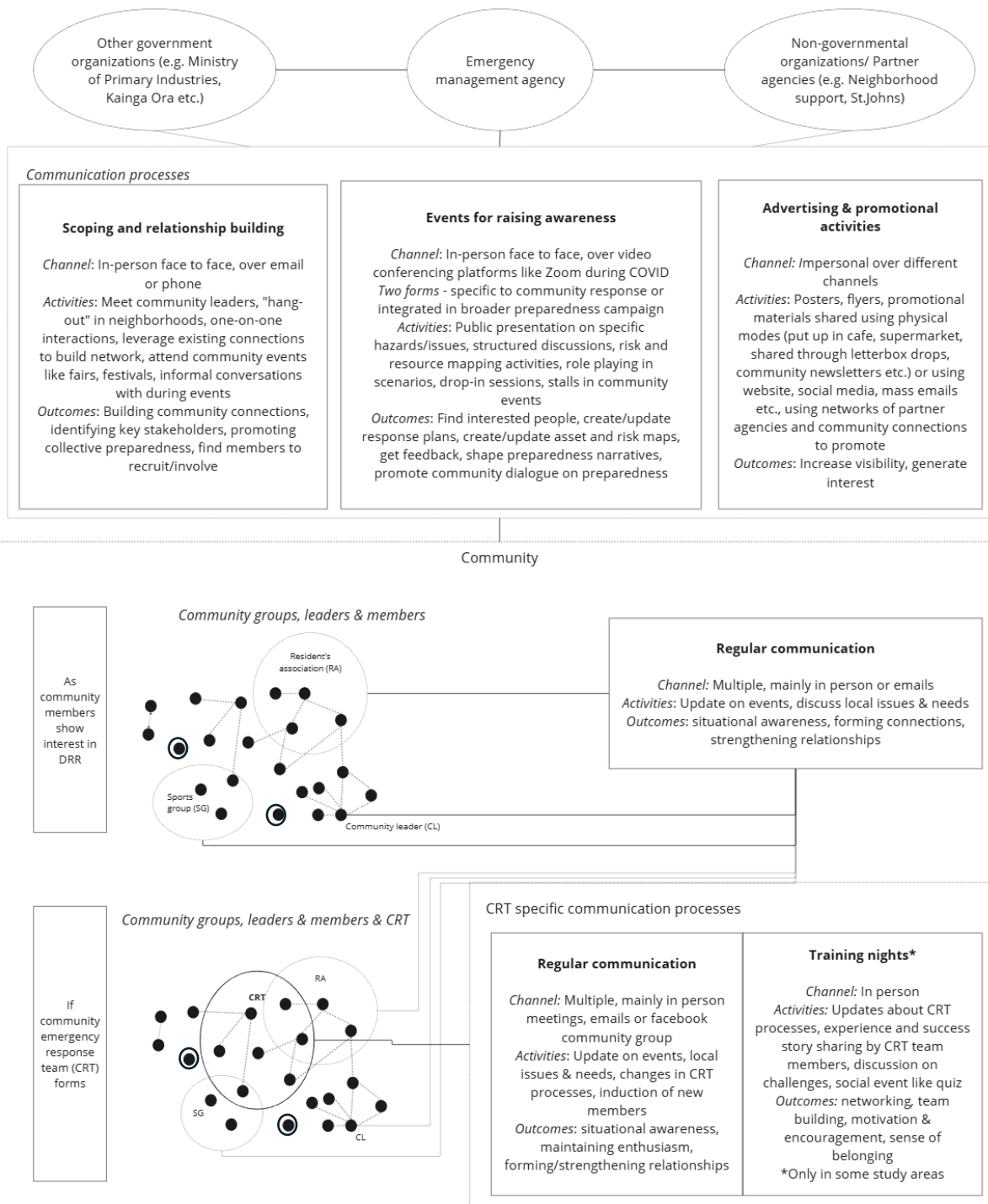


Figure 5.2 – Representative diagram of the community communication network.

It shows the communicating actors and communicative actions promoting civic participation and collective action for reducing disaster risks. Created using Miro tool (<https://miro.com/>).

5.4.2 Resources and community contexts (CAC)

Social infrastructure plays a crucial role in promoting community interactions essential to promote civic participation. Particularly public facilities with meeting halls like community centres, event centres, memorial halls, schools, and religious establishments enable community members to come

together, discuss issues, conduct activities, and engage in collective decision-making. Emphasizing the significance of physical spaces for bringing people together, a volunteer notes,

“I think shoulder tapping probably has occurred, but it generally occurs because somebody stopped to listen to the conversation..because they stand next to you, you can tap them on the shoulder and say, would you like to do something.” – W_V4

Local cafes, public libraries, supermarket notice boards and digital media (websites and social media pages) are used by communicators for informing about collective preparedness activities, upcoming events, and how people can engage in them. On the otherhand, a lack of such features in a neighbourhood constrained people from forming connections. For example one volunteer highlights how urban neighbourhood structures are challenging to engage with people,

“We've tried to meet people in the apartments and get apartments more involved. It is difficult. You can't go in and put up notices in an apartment block because the doors locked... we need someone from inside who is part of your group.” – W_V1

It is also important to have comfortable, familiar and safe spaces in the neighbourhood that facilitate interactions and informal conversations among community members. It was found to be particularly important to form connections between different groups in a neighbourhood. A volunteer mentions,

“(We have) people who are a bit too frightened to turn up to public meetings.. There's a person... He's very nervous on the phone but he rings nonetheless.. So, they've really only come from personal one on one conversations.. I think both (names another volunteer) and myself have met him on the street now and then, and we just stop and say g'day, how are you, how's it going?... it all starts with face to face” - W_V2

Neighbourhoods with diverse groups such as young people, migrants, ethnic minorities, and individuals from underrepresented groups were identified as more challenging to connect with. However, the findings suggest that the problem primarily stems from challenges in establishing connections with and between the groups and gaining their interest. For example, one official notes that,

“There have been areas where communities have been identified as a quite key priority community to engage with, but it hasn't been possible as of yet to either find the right community leaders or to generate their interest in a way that's almost a precondition you need...” – W_EM2

Most participants find that the approach to address this again involves leveraging on community interests and existing networks and connections, some of which might not be evident without maintaining long term “community presence”. An official highlights how “we probably never reached” the most vulnerable (who are) hard to reach through more traditional means of engagement” and how “food banks can become a conduit for information” here and “it's through those types of networks that we can actually have reach.” (C_EM1).

While a communication infrastructure consisting of relational ties is important to promote civic participation, linking it with resource access and institutionalizing it is essential to translate collective action intentions to actions (Kim & Ball-Rokeach, 2006a). For example, the lack of formal recognition of community driven initiative sometimes limit ability to quickly access resources when needed. An official highlights that while having relationships is important it is “getting those relationships may be

written up” “before the event so we can go and get” things that they need instead of “sitting here with pellets of water and a storage cupboard (that) we have to swap out every year” (BoP_V2).

5.4.3 Integrating new members

To identify the actors effective in connecting with new members, we conducted a questionnaire survey (Section 5.3.2). From the responses (n=80), we found 7 main actors - authorities responsible for emergency management (council or CDEM), journalists (regional and local media), local people associated with emergency management, other groups that they are associated with (through work or volunteering), local people, people from workplace and personal connections (friend, husband, wife, neighbour) (Table 5.3). The findings highlight that authorities responsible for emergency management are the main actors communicating about civic participation. The other important actors include existing volunteer groups and local people.

Communicating actor	No. of responses
Authority responsible for emergency management (council and/or CDEM)	24
Another group that they were volunteering with	11
Personal connection (friend, spouse, neighbour etc.)	7
Local people	6
Local people associated with emergency management	5
Workplace	5
Journalists	4
Multiple sources - Workplace/ local people / Authority responsible for emergency management (council/CDEM)	2
Do not remember	16
Total	80

Table 5.3 – Survey findings on communicating actors

The table shows the actors identified in the survey as key communicators about people’s participation in emergency preparedness.

Findings about the communicative actions show multiple ways through which new members are recruited - interpersonal influence (shoulder tapped/invited by someone I know), community conversations (discussions happening in the community, word of mouth etc.), newspaper/newsletter, personal conversation (with friends, partner, neighbour), public events (meetings, information sessions), social media (community Facebook page), internet search (e.g. Google) and mass media (Table 5.4). In some cases, the participants mentioned that they received information about the groups through multiple channels (district council run programme across multiple channels, internet search, community conversations, local events booklet) before deciding to volunteer. The results highlight that the effective ways to engage people are either through interpersonal influence where people are shoulder tapped/invited to join the group or when collective preparedness is discussed in community conversations.

Communicative action	No. of responses
Interpersonal influence (shoulder tapped/invited by someone I know)	23
Community conversations	19
Personal conversation	6

Social media (e.g. community Facebook page)	5
Public events	4
Newspapers	4
Internet search (e.g. Google)	3
Newsletter	2
Mass media	2
Leaflet drop in letterbox	1
Multiple channels (district council run programme across multiple channels, internet search, community conversations, local events booklet)	5
Do not remember or unclear response	6
<i>Total</i>	<i>80</i>

Table 5.4 – Survey findings on communicative actions

The table shows the actions taken by the actors to communicate about and encourage people’s participation in emergency preparedness, as identified in the survey findings.

5.5 Discussion

The paper describes the communication practices adopted to promote civic participation and collective actions for reducing disaster risks at the community level. It outlines the communication network, resources and contextual influences and highlights the effective approaches. The data shows that emergency management agencies are the main communicators about collective preparedness. This might be because of the lingering command and control perception of emergency management that views it as central authority led actions with citizens positioned as passive recipients of support (Dynes, 2006). To encourage people’s involvement, promoting a collaborative model of emergency management emphasizing the central role citizens play in reducing disaster risks would be beneficial. Additionally, people often do not express interest in participating or actively seeking information on preparedness (Becker et al., 2012). As such, leveraging on existing networks, resources and community interests becomes essential (Balog-Way et al., 2020; Oktavianus & Lin, 2022). However, future communication efforts can also tap into people’s interest in areas like environmental protection or climate change and highlight the interlinkages of disasters with these fields to gain public interest.

Utilizing volunteer networks is useful as existing volunteers are more likely to have the interests, time, skills, and resources to volunteer in other causes. However, it is crucial to ensure that the same pool of volunteers are not overburdened by multiple community roles to prevent burnout and implement adequate mechanisms before promoting collective preparedness through volunteer groups. Supporting previous research our findings highlight the importance of community engagement facilitators (Garvey & Paavola, 2022; Sharpe, 2021a) and their relationships with the community, in the absence of which official communication efforts suffer. Formally recognizing and institutionalizing these relationships would help preserve and maintain them, even when facilitators move, thereby reducing dependency and pressure on specific individuals.

Aligning with previous studies, we find limited involvement of mass media in promoting civic participation at the community level (Kim & Ball-Rokeach, 2006a). However, contradicting CIT, we also

find limited involvement of geo-ethnic media²⁹ in collective preparedness communication. Future communication practices can target engaging more with geo-ethnic media as well as working closely with journalists and science communicators to promote mass media involvement. Based on the survey data, communication through workplace communities can be another avenue that needs further exploration.

The findings support previous research that argue promoting conversations among community members on hazards and disaster risks positively influence collective actions (Lejano et al., 2022). It also suggests that regular exchanges among community members and connectedness to each other in everyday life plays an important role in fostering civic outcomes, even in the domain of disaster preparedness (Houston, Spialek, et al., 2015; Spialek & Houston, 2018). Interpersonal influence of trusted communicators was found highly effective to promote participation (Sharpe, 2021a). Overall, the data indicates that a relational approach to disaster and risk communication is effective and is more common in promoting participation and collective actions compared to conventional communication practices that rely on mass communication and public education approaches (Balog-Way et al., 2020; Lejano et al., 2021). The current communication practices also provide an example of how a relational approach can be integrated in the conventional disaster and risk communication practices. However, evaluating this model across contexts, understanding integration challenges with existing practices, assessing its applicability in different cultures, and longitudinal studies on supporting and maintaining relational communication would be valuable. The findings highlight that a relational communication approach in itself will not be effective unless resource and institutional support mechanisms are in place. Integrating the communication infrastructure theory with collective action theories like the resource mobilization theory would help in identifying better ways to support collective efforts.

Local people, regardless of their involvement in emergency management, play an important role in the communication network by engaging in conversations about hazards and preparedness in their communities (Kim & Ball-Rokeach, 2006a). It is important to create opportunities for people to connect and engage in these community conversations. This involves not only promoting initiatives that encourage community connections, like "know your neighbour" (Wellington Region Emergency Management Office, 2024c) but also ensuring supporting communication resources, either physical (e.g. community halls, gardens etc.) or digital (Facebook community groups), that are safe, inclusive, accessible and enjoyable are in place. There is also value in understanding the communicative activities of different communicators like government agencies, local leaders, mass media, that bring preparedness into community conversations. e.g. awareness events with avenues for informal interactions. Future research can systematically compare the effectiveness of different communicative activities in generating community conversations.

Understanding communication networks of hard-to-reach groups (like migrants and young people) and leveraging the main communicating actors in their network would be advantageous for enhancing disaster communication. For example, younger individuals might be more effectively reached through universities. Additionally, utilizing a communication infrastructure perspective to explore communication inequities within different groups even in the same neighbourhoods (Matheson &

²⁹ Local media that target specific population groups, like immigrant minorities

Jones, 2016) by understanding their access to communicating actors, resources and contexts would be helpful in identifying and prioritizing groups that require more attention to strengthen community relationships and connections with authorities. Future research examining the reasons behind unequal access to communication resources, understanding how power dynamics are reproduced within these networks, how disparities emerge in the relational networks, which perspectives gain dominance, and identifying methods to address these inequalities would be beneficial.

Initially we attempted to map the communication infrastructure using survey based social network analysis (Wasserman & Faust, 1994). However, the pilot surveys did not return satisfactory data, so we outline the network using qualitative data. Nevertheless, a quantitative analysis would provide more generalizable findings. We also intended to identify the messages and conversations that were most effective in recruiting new members. However, most people could not remember the message or conversations that had an impact on them or that convinced them to join the collectives. Future research can focus on the messages shared in these networks to understand effective messages. Additionally, in community communication networks, information and messages are often shared through conversations and narratives. These narratives are critical in influencing the interpretation of events, shaping the understanding of the world, beliefs and attitudes and can play an important role in influencing civic participation and collective action (Dawson, 2020; Fisher, 1985). Future research could benefit from a critical analysis of the narratives shared within these networks to understand how they foster civic participation, assess their impacts, identify potential issues, and explore areas for improvement.

There is an increasing adoption of social media in collective preparedness communication, despite concerns around social media (Endsley et al., 2014; Hughes & Palen, 2009; Knuth et al., 2016; Plotnick et al., 2015). Future research can benefit from studying emergency managers' and community members' use and perspectives of social media, identifying their role in supporting civic participation and broader preparedness actions, key concerns and the areas of improvements like necessary guidelines, policy documents and upskilling needs. Additionally, though innovative communication techniques, such as games, virtual reality simulations, and citizen science applications, are being experimented with, we did not find their adoption in the routine practices of collective preparedness communication. Future research can explore why emerging technologies are still underutilized by examining their effectiveness, perceptions, practicality, and adoption challenges. This is crucial for identifying the most effective tools, optimizing their use, and prioritizing investment efforts.

5.6 Conclusion

This paper aimed to explore the communication practices that promote civic participation and collective action at the community level for reducing disaster risks. Drawing on data from four regions of New Zealand, and guided by the communication infrastructure theory, the findings suggest four main actors in the collective preparedness communication network - emergency management agencies, emergency service agencies and allied government organizations, non-governmental or community-based agencies, and local people, with emergency management agencies being the main communicator. Scoping and relationship building activities, awareness raising events and advertisements and promotions are used to engage with community members. Government and community-based organizations promote disaster and risk reduction activities within their networks and connect interested people with emergency management officials. Local people engage with the

communication streams, often re-sharing them with their connections. This process helps in improving hazard knowledge, generating a shared interest on hazards and preparedness actions, and often trigger community conversations that lead to civic participation. A conceptual map of this communication infrastructure is presented. The paper also highlights the importance of interpersonal influence, community conversations, presence of safe and accessible social infrastructure, skilled facilitators, existing community organizations with networks and relationships and supporting institutional and resourcing mechanisms in promoting people's participation in collective preparedness actions. We expect the findings will contribute to communication research and practices supporting community actions on disaster risks and will also help in advancing the broader fields of disaster and risk communication, climate change communication and ecology and environmental communication.

Chapter guide

Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.		What are we studying?
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study		How are we studying it?
Chapter 4 Civic participation & collective action	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Existing communication practices	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Communication content	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Emerging areas of communication	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Chapter 6 Examining the narratives shared to encourage civic participation and collective action in disaster preparedness

Background: This chapter presents the second manuscript, examining the narratives shared to promote civic participation and collective action for reducing disaster risks. The data revealed that in a community communication network described in the previous chapter, information and messages on disaster preparedness typically flow through narratives shared in conversations among the different communicating actors instead of structured and targeted messages. This chapter, therefore, examines these conversational narratives, to understand what is shared, how it influences community action and the key concerns.

The manuscript is currently published as: Das, M., Becker, J., & Doyle, E. E. (2025). 'One big team working together'-Shifting narratives to encourage civic participation and collective action in disaster preparedness. *International Journal of Disaster Risk Reduction*, 118, 105218.

An earlier version of the article was presented at: Das, M., Becker, J., Doyle, E. E. H., & McBride, S. (2024, July). Changing Narratives to Encourage Civic Participation in Disaster Preparedness [Oral Presentation, presented by McBride, S]. Natural Hazards Centre 2024 Researchers Meeting, Colorado, US.

Abstract

Disaster risks cannot be reduced by individual efforts alone and necessitate community participation and collective action. However, communicating and encouraging collective action is difficult. Existing studies show that stories and narratives are useful to convey complex less-understood phenomena, like disasters, in a comprehensible and relatable manner. As such, this paper explores existing disaster narratives and aims to understand how they encourage civic participation and collective action for reducing disaster risks. The findings show that the framing of disasters in mass media narratives are unlikely to encourage collective action as they do not emphasize citizens' agency and efficacy in reducing disaster risks. However, in the narratives shared at the local level between emergency management agencies and community members, there is currently a shift towards emphasizing community agency, efficacy, and responsibilities in reducing disaster risks. Four dominant themes are identified in these narratives: reframing the concept of *heroes*, promoting connection and care, emphasizing collective efficacy and collective responsibility. While the narratives are beneficial, they also cause some tensions, such as, confusion arising from lingering response-centric narratives; frustration around the collective responsibility narratives; and resistance to the current narratives as they are perceived as attempts by agencies to transfer emergency management responsibilities to people. The implications of the findings and the future directions are presented.

Keywords: *Narrative, civic participation, collective action, disaster preparedness, disaster risk reduction*

6.1 Introduction

Growing evidence indicates that engaging with communities and involving them in risk reduction efforts is crucial for building their resilience (Ireland & Thomalla, 2011; Antonientte Mitchell et al., 2010; Shaw, 2012; Spialek & Houston, 2019). Since community members are often the first responders during a crises and play a critical role in providing initial support before formal state intervention (Victoria, 2009), it is important to prepare and empower them in pre-crisis times such that they can take swift action during an emergency (Shaw, 2012). Recognizing the importance of community involvement in disaster risk reduction (DRR), the Sendai Framework for Disaster Risk Reduction, an international agreement on DRR, urges civil society, volunteers, and community-based organizations to collaborate with public institutions to reduce disaster risks (United Nations Office for Disaster Risk Reduction, 2015). In New Zealand as well, the policy environment encourages community involvement - the 2002 Civil Defence Emergency Management Act emphasizes the role of communities in managing their risks (Ministry of Civil Defence and Emergency Management, 2002) and the 2019 National Disaster Resilience Strategy under its third priority explicitly calls for participation and collective action by communities to build a resilient nation (Ministry of Civil Defence & Emergency Management, 2019, p. 31).

Communication is central in this process of engaging with communities and encouraging civic participation and collective actions (Buzzanell, 2010; Houston, Spialek, et al., 2015; Klavina & van Zomeren, 2020). Traditionally disaster and risk communication have followed a rational approach guided by cognitive and psychological studies (Lindell & Perry, 2012; Renn, 1992; Tversky et al., 1982). The emphasis is on presenting scientific information about hazards and recommended actions clearly in a logical manner, using rhetorical argumentation, backed by data and statistics with the expectation that people will process this information, make decisions, and adopt actions following scientific rationality and reason (Fischhoff, 1995; Sharpe, 2021b). However, research suggests information flowing passively from experts and authorities to the public are often complex and technical in nature and fails to clearly convey the concern and generate interest (Balog-Way et al., 2020). Understanding what the abstract technical hazard information and recommended measures imply in terms of actions that the community members can adopt in their specific context becomes difficult, especially for rare events that community members have not experienced (Lejano et al., 2020). Thus this approach is insufficient to prompt people's participation and collective action (Sharpe, 2021b).

Given the limitations of the rational approaches, there is a growing interest in the relational and network-oriented perspective of disaster and risk communication (Houston, Spialek, et al., 2015; Zhu & Lejano, 2024). The relational perspective views people as situated within social networks and communication as an exchange between peers within this network (Lejano et al., 2018). It argues that stories, anecdotes, and narratives shared in conversations in this network of peers become the vehicles through which community knowledge, perspectives and actions are shaped (Chamlee-Wright & Storr, 2011). Studies in communication, marketing, health and psychology, demonstrates that narratives can be used to raise awareness of social, political, and environmental issues and garner support for or against them (Balog-Way et al., 2020; Braddock & Dillard, 2016; Dahlstrom, 2014; Janssen et al., 2013; Margolis et al., 2019; Shen & Edwards, 2023); like, grievance-based narratives are powerful in initiating and maintaining civil wars (Unruh & Abdul-Jalil, 2014), and victim and hero themes in narratives encourage protective actions during the outbreak of infectious disease (Liu et al., 2020). For disaster

and risk communication, narratives are suitable to deliver contextual personalized information in a language that is understandable, engaging, relatable and easy to act on (Kim & Ball-Rokeach, 2006b; Shanahan et al., 2019). Given that much of the current understanding of disasters, vulnerabilities and capacities is shaped by narratives of individual and collective experiences of extreme events of the past – they are an intuitive way of conveying complex unfamiliar processes (Jerolleman, 2021; Kelman et al., 2015). Particularly, narratives are helpful to engage people in conversations, re-frame public imagination, influence how people think about disasters, highlight human agency and mobilize people to reflect on strategies and implement actions to reduce risks; thus suitable to promote civic participation (Chamlee-Wright & Storr, 2011; Hou, 2023; Kim & Ball-Rokeach, 2006a).

While the potential of narratives is recognized, there is limited evidence on how narratives can be adopted in disaster and risk communication practice alongside the existing rational technical communication to promote civic participation and what are the challenges. To develop a clear understanding, there is a need to answer questions like - what are the existing narratives about disasters and risks prevalent at the community level? How do these narratives frame civic participation? How actors like emergency management agencies, community-based organizations and community members perceive and engage with these narratives? What is the impact of these narratives? Which narratives are problematic and how can they be improved? This study aims to answer the above questions.

The following section presents the extant literature discussing what narratives are, why they are influential, what disaster narratives currently exist, how they promote civic participation in the pre-disaster context and what gaps persist. Then the methodology of the study is presented followed by the findings, discussion, and conclusion.

6.2 Literature Review

6.2.1 Narratives and civic participation

What are narratives?

Narratives emerge from the everyday stories and conversations that media, community organizations and local people engage in and share (Kim & Ball-Rokeach, 2006a). The terms *narratives* and *story* are frequently used interchangeably (Hou, 2023) and refer to the portrayal of interconnected events and characters in a specific space and time structured in a cause-and-effect format (Dahlstrom, 2014). The same event can be depicted in various ways across different narratives, where some elements of the event can be emphasized to different extents to align with the communicator(s)' perspective and desired representation of the event (Caswell & Dörr, 2018). For this study, we consider narratives as a symbolic representation of events that contain a "character or characters" (Dillard & Shen, 2013, p. 201) and are about the local community (Kim & Ball-Rokeach, 2006a).

Narratives are communicated in various ways. It ranges from transmedia storytelling (using multiple media integrating vivid imagery with evocative descriptions) often adopted by government agencies or corporate organization to convey a message through a compelling story (Bourdaa, 2014; Gambarato & Medvedev, 2015; Heilemann et al., 2018), to narratives shared through mass media about topics of interest that shape public knowledge, behaviours and opinion (Gonsalves et al., 2017; McKinzie, 2017),

to oral narratives of personal stories, actions, challenges, resources, and aspirations shared by community members through monologic stories or through conversational storytelling (Hou, 2023; Norrick, 2007).

Persuasive power of narratives

The narrative paradigm by Fisher (1985) claims that humans are storytelling animals. In everyday community life, people do not rely on scientific-logical arguments which are common in science or policy - rather much of human argumentation, decision-making and life choices rely on stories shared among people. Embedded in these stories are people's reasons and values. Community members construct their realities through their interpretation of the different narratives - which stories people resonate with is influenced by lived experiences, personal values, and pre-existing socio-cultural narratives. By connecting individual experiences with shared social values, stories shape beliefs and attitudes.

The elaboration likelihood model (ELM) suggests that the initial step to influence behaviour through a message lies in capturing and sustaining an individual's attention, prompting them to engage with and process the information (Baranowski et al., 2008). Narratives are relatable, and interesting and hence more likely to capture an audience's attention and enhance their intentions to engage with the information and generate conversations (Shen & Edwards, 2023). Narratives can absorb individuals in the story, transporting them away from the realities of their daily lives and into a narrative realm where they can immerse themselves in the story's experiences (narrative transportation) (Green & Brock, 2002). This immersion in the narrative world fosters vibrant mental imagery, emotional reactions, and responses to the story directing people's attention to the narrative itself rather than the underlying messages and logical arguments (Escalas, 2004; Shanahan et al., 2019; Van Laer et al., 2014). By engaging people both cognitively and emotionally, narratives become more impactful than non-narrative messages (e.g. reports, statements) that feature persuasive arguments or logical-scientific proof which activates only cognitive reasoning.

Moreover, rhetorical strategies employing argumentation or logical-scientific statements are useful for persuasion in domains like science or policy. However, people talk amongst themselves in everyday life using narratives (Dahlstrom, 2014). These narratives reflect the values, beliefs, and reasons to justify a call to action. Thus, narratives, and not logical-scientific statements, guide rhetorical argumentation in real life among people. This shapes individual and public opinion, decision making, and is influential in engaging us into actions that shape our future.

Structuring scientific information in the narrative format is more likely to lead to its adoption in everyday conversation, support its dissemination and generate social support (Lejano et al., 2018). As the persuasive intent of narratives are not apparent, narratives reduce our intentions to oppose and counterargue against the messages shared (Ratcliff & Sun, 2020). Thus, for "communication of science to nonexpert audiences, stories, anecdotes, and narratives become not only more appropriate but potentially more important" (Dahlstrom, 2014, p. 13614).

Narratives, and civic engagement

Central to community building and civic participation is communication (Carpini, 2004; Nah et al., 2016; Robertson & Stephens, 2022). Habermas' seminal work on the Theory of Communicative Action (TCA) posits that communication is not only for transfer of information, but also about reaching mutual understanding. By engaging in a conversation, the public present their viewpoints, express their interests, and engage in argumentation to resolve conflicts, reach a consensus through reason, and take collective action to resolve problems (Habermas, 1984).

The communication infrastructure theory (CIT) advances this idea (Kim & Ball-Rokeach, 2006a). However, instead of focusing on rational discourse in communities following TCA, the CIT explores the role of narratives and storytelling in civic engagement. CIT argues that storytelling is integral to building communities. Storytelling happens through everyday conversations among community members where they share local stories, information, news, etc. The narratives shared during conversations in a neighbourhood storytelling network³⁰ allows community members to relate to their neighbourhood and generate a shared sense of reality by discussing their identities, aspirations, challenges and lived experiences. The framing and re-framing of the narratives shapes the community members' idea of what the community is, what the community values and what community features they should preserve and carry forward. Such story telling engenders a sense of solidarity and community, which is a key factor in motivating civic participation. Stronger connection to the neighbourhood storytelling network also enables community members to identify local resources to attain their individual or collective goals (Nah et al., 2016). Thus, narratives shared through conversations have a strong role in catalysing civic participation and collective action.

6.2.2 Communication, civic participation and collective action for reducing disaster risks

Collective component in pre-disaster communication

In the pre-disaster stage, communication activities help in improving preparedness by providing information about risks and existing resources (e.g. hazards in the area, who are exposed), involving the community in discussions on risks and plans for response (e.g. developing a response plan), promoting preparedness and mitigation activities (e.g. preparing a grab bag, installing disaster mobile apps), and fostering community connections and relationships (e.g. identifying interconnections between community members, building trust) (Houston, 2012).

These communicative activities have both an individual and collective component. The individual component of communication highlights individual agency, responsibilities, and recommended protective actions for emergencies at an individual level. The collective component of communication helps in situating individuals in the broader community context, builds a shared understanding of risks, fosters community relationships and supports individuals to access resources available within the community to address hazard risks (Robertson & Stephens, 2022). For example, in wildfire prone areas, property owners may communicate amongst themselves to form networks and collaboratively conduct prescribed burns, fuel treatments³¹, and plant fire resistant vegetation to effectively mitigate

³⁰ Network of people, community organization and media that share everyday neighbourhood stories

³¹ Controlled burning, pruning, chipping, and clearing inflammable plant material to reduce the quantity and the continuity of combustible vegetation.

wildfire risks, which cannot be attained by individual efforts alone (Canadas et al., 2016). Prior to hazard events, community members may share warning and preparedness messages within their social networks to protect loved ones, thereby amplifying effects of official communications and sometimes influencing hard to reach groups (Lejano et al., 2023). Such communicative actions also helps in building deeper connections within the community, fostering a sense of belonging, and attachment and contributing to social capital all of which contribute to disaster resilience (Houston, Spialek, et al., 2015; Ireland & Thomalla, 2011). Thus, the collective component highlights the social situatedness of individuals, fosters a sense of community and encourages co-operative efforts for protecting all members of the community.

However, the “collective component” of pre-disaster communication is often “not apparent” (Spialek & Houston, 2019, p. 16) and the focus remains limited to individual responsibilities and protective actions. To advance communication for building community resilience there is a need to integrate the collective component in pre-disaster communication through targeted communicative efforts that build a shared understanding of risks, foster collective efficacy beliefs³², and encourage civic participation and collective actions among community members (Burnside-Lawry et al., 2013; Spialek & Houston, 2019).

Narratives and the collective component

As discussed in section 2.1, narratives make scientific information and complex data easily understandable and relatable by translating it to everyday language and connecting it with lived experiences and struggles of community members (Hou, 2023). This knowledge empowers community members to reflect on their experiences of hazard events and apply their practical contextual knowledge in finding solutions to complex hazard related problems (Lejano et al., 2023). Only when residents are well-informed and empowered to make decisions, and take proactive steps, can they exercise their ability to make choices and take actions that ensure their preparedness. Narratives also help in developing a shared understanding of reality; thereby reconciling differences on perceptions of disasters and risks among different community members, fostering a sense of solidarity and building consensus to mobilize collective action (Kim & Ball-Rokeach, 2006b). Studies have shown that narratives are an effective tool for encouraging community involvement in (Lejano et al., 2021; Warner & Meissner, 2021) and there is a need to further explore their role in building resilience (Buzzanell, 2010).

Drawing on the above discussion, we contend that narratives can be applied to communicate the collective component in pre-disaster communication.

6.2.3 Narratives on disasters and their limitations

Disaster narratives

Much of our understanding of disasters is shaped by what we learn about disasters when it occurs and, in its aftermath, when disasters generate interest and become newsworthy. As disasters stages are

³² Belief that by working collectively we can minimize the effects of disaster.

cyclical in nature, there is no marked distinction between post event and pre-event communication, our social learnings from post event narratives are carried forward and form our notions about disasters in the pre-event stage. Hence, it is important to look at disaster narratives shared during and post event and identify how it shapes our perceptions of disasters and preparedness.

Disaster narratives are shared in mass media (macro), at the town or community level (meso), or neighbourhood or individual level (micro) (Kim & Ball-Rokeach, 2006a). These narratives predominantly focus on disaster experiences and recovery (Carlin & Park-Fuller, 2012; Drennan, 2018; Irawanto, 2018; Miles & Morse, 2007; Sayers et al., 2023). Examining disaster and crisis related narratives, Seeger and Sellnow (2016) identify five dominant narratives - accounts of blame (who is to blame), victim narratives (suffering and recovery of individuals), heroic tales (protagonist overcoming odds, exemplify altruistic behaviour), stories of renewal (narratives of growth, learning, restoration), and memorials (meaning-making of the destruction, reflects on human spirit and values, supports grieving and healing process). These narratives are fundamental in shaping our comprehension of disasters and how we can respond to them.

The first four forms of narratives are particularly influential in shaping discourse on preparedness. In the victim narrative the people that are harmed in the event are depicted as people who had no control over their situation in the face of a “natural” disaster (Buchtman et al., 2023). Thus, the challenge with the victim narrative is that people are placed in a powerless position, taking away their agency to act in the event, or to act prior to the event to prevent its occurrence (Parida et al., 2021). On the other hand, the blame narrative assigns responsibility of the event on an external agency. While blame narratives are important to highlight systemic flaws and call for corrective measures, competing narratives of blame often divide the public and remove attention from learning from the event and taking actions to prevent the event (Ewart & McLean, 2015; Saldaña, 2022). While regeneration narratives are circulated after extreme events, their coverage is typically short lived, like general disaster stories (Houston et al., 2012), and does little to inform preparedness narratives.

The hero narrative is favourable to promote proactive action for preparedness as it highlights human agency in the face of a disaster and promotes positive emotional and behavioural responses (Shanahan et al., 2019). By placing proactive people at the centre of the story it facilitates a shift in our lens from looking at people as passive elements to active agents in the story who address local challenges by sharing their knowledge, experience and expertise (De Meyer et al., 2020). Heroes can be the first responder, the leader, or a common citizen. However, stereotypical portrayals of heroes as strong masculine stoic persons in the form of first responders or efficient leaders (Figueroa, 2022) reinforces the idea that only people who possess certain characteristics, and not the ordinary common person, can make a meaningful contribution before or during disasters. Actions by citizens, even when discussed, are simplified (Carter & Kenney, 2018) and portrayed as largely “spontaneous” (Nissen et al., 2021), and reported using an individualistic lens - dissociating them from prior conditions in the community that influenced their emergence. Thus, the narratives around disasters dominant in the mass media and popular discourse often fail to acknowledge the role of human agency, pre-existing characteristics of the community, and the broader socio-political context in moderating the effects of an extreme event. This narrow framing of disaster is unfavourable for encouraging civic actions to prepare for disasters.

Pre-disaster narratives

Beyond sharing disaster warnings and occasionally playing a watchdog role in highlighting major hazard risks, the involvement of mass media in communicating about disasters prior to major events is limited (Houston et al., 2019). This might be because of disinterest of people in preparedness stories or unfavourable public reaction to hazard risk stories (Houston et al., 2019; Radford & Wisner, 2012).

At the meso level, emergency management agencies, and associated government agencies often are the key communicators about disasters. While narrative formats for disaster and risk communication are becoming popular (Warner & Meissner, 2021), their adoption by emergency management agencies and other stakeholders in public education content to raise hazard awareness and prompt protective actions is still in its infancy. The rational model of communication persists which communicate scientific information and recommended actions using a non-narrative structure (Sharpe, 2021b).

The above discussion suggests that there is a lack of pre-disaster narratives, and the post disaster narratives are inadequate to encourage civic participation for reducing disaster risks. A “new narrative is needed to motivate, inspire, and empower a transformational whole-of-society change in to action (Buchtman et al., 2023, p. 54)”. The new narratives need to highlight citizen agency in preventing disasters (Shanahan et al., 2019), build citizen identity, encourage shared responsibilities (Buchtman et al., 2023) and promote collective efficacy (Houston et al., 2019) such that collectively we can take actions that will reduce the impact of disasters.

However, an area that remains understudied is narratives on disasters shared outside mass media or public education content - like oral or conversational narratives shared in the pre-disaster stage at the meso and micro level. Studies demonstrate that conversational narratives shared amongst community members are an important avenue to promote civic participation and collective action (Kim & Kim, 2021; Lejano et al., 2020). Given that emergency management officials are increasingly engaging with community members to promote community resilience through dialogical communication in the form of in person workshops, community meetings, interactive presentations, and informal conversations etc. (Ministry of Civil Defence Emergency Management, 2010; Ryan et al., 2020; Wellington Region Emergency Management Office), exploring the oral and conversational narratives become important. We are still unaware of what narratives are shared in these conversations amongst emergency management agencies, community leaders and community members, how they frame civic participation and collective action, what resonates with people and sustains in the meso and micro level, and how it influences people’s perception, understanding and actions on disasters, particularly to foster civic participation and collective action. As such, our first research question is,

RQ1: What narratives are shared at the meso and micro level, particularly through oral medium, and how do they frame civic participation and collective action for disaster risk reduction?

Additionally, more evidence is required on what forms of narratives are effective and what are less likely to work, particularly with regards to the emotional appeal integrated in the narratives. For example, research is still divided on whether narratives should focus on concern and worry, or optimism and hope (De Meyer et al., 2020). As narratives present the story as evidence for the claim, without needing to explicitly justify their accuracy (Dahlstrom, 2014), there are also concerns around

subjectivity and bias in narratives (Lejano et al., 2023). Additionally, as discussed previously, narratives are inherently persuasive as they engage the audience emotionally. The persuasive intent in narratives is not apparent, so they are less likely to face opposition and more likely to influence people. Given the persuasive power of narratives, there is a need to understand the ethical implications of using narratives to encourage collective preparedness, and what should be avoided (McComas, 2006). Thus, while narratives are promising, our understanding of the problems associated with narratives in disaster preparedness is still evolving. In this context, our second research question explores:

RQ2: What narratives about civic participation and collective action for disaster risk reduction are problematic, why they are problematic, and how the issues with such narratives can be addressed?

6.3 Methods

A qualitative multi case study design was adopted to conduct the research as it helps in gaining a comprehensive understanding of the phenomena under study in a real-world setting with all its complexities (Guetterman & Fetters, 2018).

Four geographic community groups working with emergency management officials to improve preparedness of their areas were included in the study – a resident’s association in Mt Cook suburb in Wellington (urban group, predominantly mobile population), the community response group in Gore, Southland (township, settled population), the community emergency response team from Edgecumbe, Bay of Plenty (township, settled population) and the community response team in Selwyn district, Canterbury (both rural and urban population) (Figure 6.1). The first two were already existing groups that the emergency management agencies connected with. The community-based response teams were facilitated by the respective councils and emergency management agencies. This mix of groups were selected as they possess different demographic characteristics and hazard experiences. The objective was to identify the commonalities and differences in narratives across these different groups.

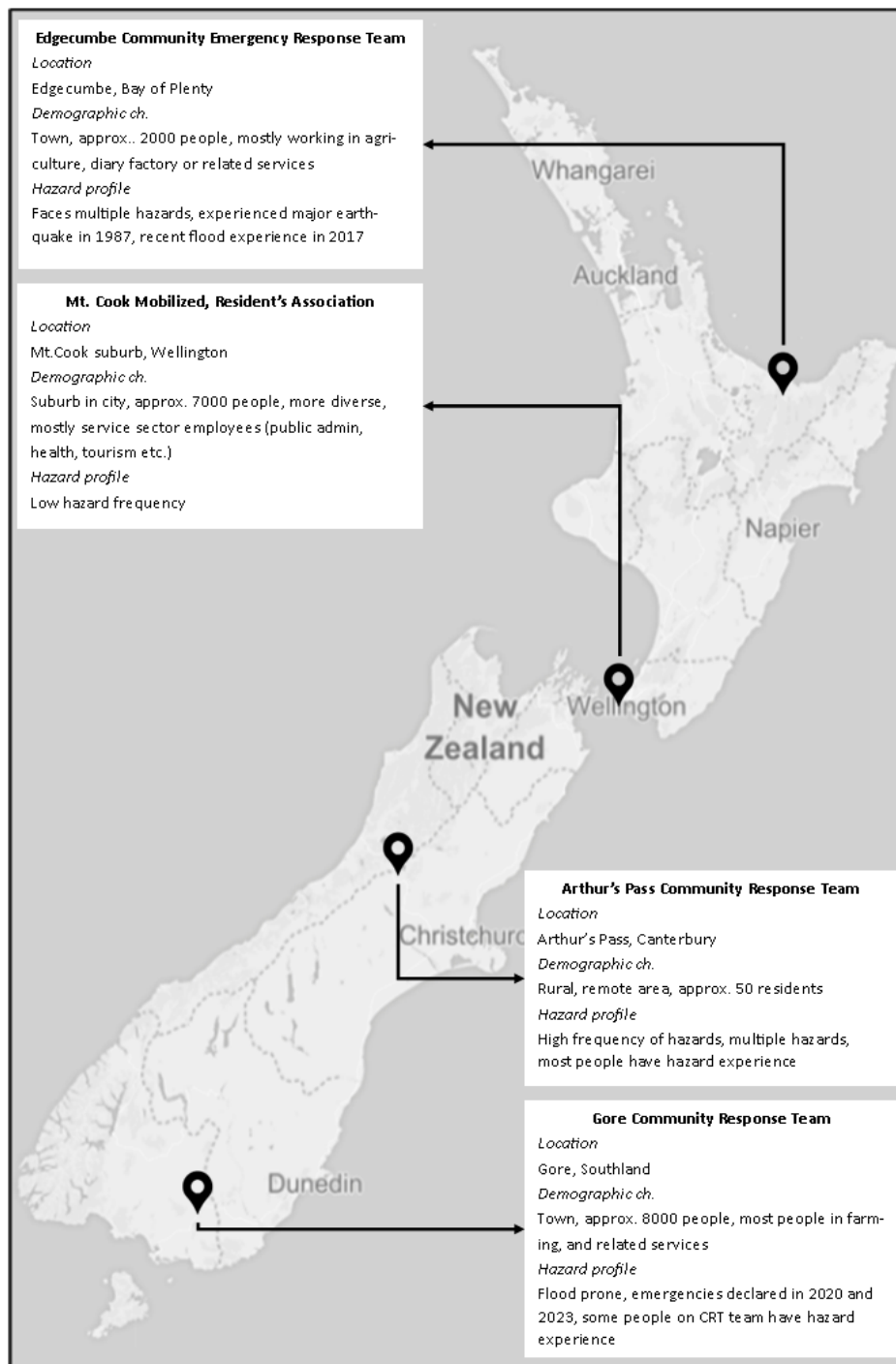


Figure 6.1 – Map of study areas (Edgumbe, Wellington, Arthur's Pass and Gore in New Zealand)

Guided by the Communication Infrastructure Theory (that proposes that narratives shared in community conversations facilitate civic engagement), we wanted to examine the narratives used in disaster communication at the meso and micro levels. To understand this, we conducted thirty-five (35) interviews with emergency management officials, representatives of community-based organizations, community leaders and members of the four community groups. The questions inquired about what is communicated about emergency management, what messages, narratives and stories are shared and how community members perceive their role in emergency management. Participant profiles are presented in Table 6.1. Semi structured interviews of 1 to 1.5 hours were conducted over

video call or in person from February 2022 and September 2023. The interviews were audio recorded with consent except for three interviews where only written notes were taken with consent respecting the preference of the interviewees. The interviews were transcribed and loaded in qualitative analysis software NVivo. Open coding was conducted to identify the major themes (Bell, 2010).

<i>Area</i>	<i>Participant profile and participant codes</i>	<i>No. of participants</i>
Bay of Plenty	Volunteer in collective preparedness (BoP_V1 to BoP_V4)	4
	Emergency management (CDEM) official (BoP_EM1)	1
	Official from district council (BoP_EM2 & BoP_EM3)	2
	NGO personnel assisting in collective preparedness (BoP_N1 & BoP_N2)	2
Wellington	Volunteer in collective preparedness (W_V1 to W_V5)	5
	Emergency management (CDEM) official (W_EM1 to W_EM4)	4
Canterbury	Volunteer in collective preparedness (C_V1 to C_V8)	8
	Emergency management (CDEM) official (C_EM1)	1
	Official from district council (C_EM2)	1
Southland	Volunteer in collective preparedness (S_V1 to S_V6)	6
	Emergency management (CDEM) official (S_EM1)	1
	<i>Total</i>	35

Table 6.1 – Participant profiles and identity codes used herein.

The first author attended community group meetings (4), a community emergency hub training (1) and an annual training night (1) as non-participant observer (Figure 6.2). We found that in person informal communication (e.g. informal interactions between emergency management official and community members in community events) plays an important role in disaster preparedness communication at the meso and micro level. So, the first author attended multiple community events, and social gatherings where emergency management officials, community groups and community members interacted. During these events, there were multiple opportunities to converse with the participants informally and observe interactions in social settings. Rough notes were taken during the events, and detailed notes were written after returning from events, based on the first author’s experience of what happened. The notes reflected on what was communicated during the events, and what narratives community members shared regarding disasters that highlighted the collective element of preparedness.

We also collected documents, posters and other promotional materials shared by the agencies, written material shared during different events and written materials found in community places like libraries, cafés, shopping centres etc. regarding disaster preparedness (Figure 6.3). Content about community preparedness and resilience in the commonly referred public facing websites (Wellington regional emergency management office, Emergency management Southland, Gore district council, Civil defence emergency management Canterbury and Selwyn district council) were also noted in a word document. Content related to preparedness shared in social media of the abovementioned organizations and the community groups under study for the past one year were also scanned for content related to collective aspects of preparedness, and relevant content noted in a word document.

The fieldnotes, written materials and digital content were also open coded. We were not looking for the number of occurrences of specific words/phrases, rather we were looking at the dominant ideas conveyed in these materials. Though narratives and argumentation are two distinct forms of persuasive statements, seldom are they used alone and often narratives contain, claims and evidence, and argumentative statements embedded in stories, and anecdotes which are narrative in nature (Atkin & Salmon, 2013). Based on this understanding, we intended to examine the narrative elements manifest in communications shared across the different channels. The codes were consolidated to identify the main themes.

Ethical approval for the research was secured from Massey university and ethical standards as per the university guidelines were maintained. Member checks with the participants were conducted to ensure the findings were credible and reliable (Creswell, 2009).

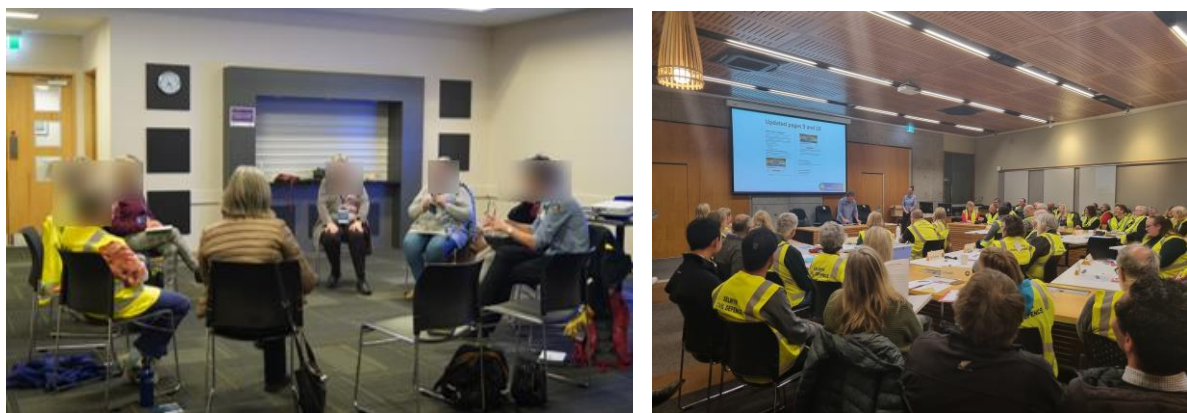


Figure 6.2 – Community emergency response team meeting and training night (in Selwyn)



Figure 6.3 - Communication material shared at a meeting (in Selwyn) and found at a café (in Wellington)

6.4 Results

The section below discusses i) how new narratives are introduced at the micro and meso level to promote civic participation in disaster preparedness, and ii) highlights the tensions arising because of the shifting narratives.

6.4.1 Preparedness narratives to encourage collective action

In the study areas, we observed a shift in narratives shared at the meso and micro level to incorporate the collective component alongside the individual component in conversations around preparedness. In the past, conversations on preparedness “very much focused on the individual”, with messages like “get your get your kit ready, have an exit plan for your family” etc.; however, the recognition that “the reality of an event is that community members tend to help each other” have caused an increase in community focused conversations on preparedness (W_V2). We find four dominant themes relating to civic participation and collective action in the narratives:

Re-framing our understanding of heroes - ‘Everyday heroes’

Our comprehension of what a disaster is, what skills are valuable in disasters and who can meaningfully contribute during a disaster derives from the mainstream response centric view of disasters. The prevailing understanding is that people with specialized skills, like first responders, emergency management agencies, military, medical service providers, and community leaders are valuable in disasters with common people having little to offer. To mobilize citizens for community preparedness, it is necessary to re-shape this conception of who is valuable and how they can be valuable.

Narratives shared by emergency management officials, community organizations, and volunteers expanded the idea of who is valuable in a disaster - extending it beyond skilled practitioners to include citizens. For example, the following statement by an emergency manager shows how the idea of who is valuable, and who can be a ‘hero’ after a disaster is being reframed:

“People come up for a chat and go I've been wanting to maybe get a little more involved, but I don't want to do much you know, and we are like that's fine are you happy making a cup of tea? ... People think civil defence, oh God, I'm going to rescue someone ... No, you can just make a cup of tea, a sandwich and that's fine.” – S_EM1

Similar sentiment was reiterated by senior officials at an in-person training night organized by the district council, who highlighted the potential number of deaths and harm that could have happened in a recent event and mentioned:

“If it does not happen, it is because of you... You are the few that have chosen to serve the many and we thank you for that.” – Senior official, Selwyn district council

Acknowledging that “everyone brings something to the table that can help’ and recognizing that every contribution has a value (BoP_EM2), offers citizens a chance to rise to the occasion and make a positive impact before and during a crisis through actions within their capacity. It does not require citizens “to be a superhero”, an exceptionally strong, brave, self-sacrificing person willing to take risks. Rather it posits that anyone can be a hero by helping through everyday ordinary actions - an everyday hero. Thus, it re-constitutes the idea of a hero by moving from a physical risk hero stance towards a principled and value driven hero who is helpful, kind and empathetic towards their community (Franco et al., 2011). Embedded in the quotes above, we can find examples of the actions that the everyday hero can take up (provide comfort (tea, food) when a community is disrupted by an extreme event, update the council about the on-ground status, like the extent of damage, emerging needs etc.). This

reconstitution brings back citizen's agency in the narratives putting them in positions to make real world changes in ways that align with their experiences, capacities, and aspirations. Reflecting this narrative a community member mentions: "We're not out there to save the world...I look at it that anything that we do...will be a help to someone, and so if you can help one person that's fine." (C_V7).

Valuing 'connection' and 'care'

Relationships, such as those among family, friends and community, are crucial during emergencies as it helps in securing information, immediate support, resources, and emotional comfort during disasters (Aldrich & Meyer, 2015; Dynes, 2002). Additionally, the neighbourhood and geographical communities become important, as neighbours can offer immediate assistance and help address emerging issues using local resources (Kyne & Aldrich, 2020). Following this, there is an increasing emphasis on connectedness in public education and awareness messages like, "Get to know your neighbours and community" (Civil Defence Emergency Management Canterbury, 2024), "Meet your neighbours" (Wellington Region Emergency Management Office, 2024c), "Help keep your family, friends and community safe by getting involved in emergency preparedness" (National Emergency Management Agency, 2024), "Are there people in your community who might need extra help in an emergency? Ask around and make sure everyone will be taken care of" (NZ Civil Defence, 2023) etc.

Narratives conveying the theme of connectedness are observed in conversations as well. Such narratives are often tied to a message of community care, which emphasize the importance of helping behaviours within connected communities and highlights actions individuals can take to build connections and enhance the well-being of their community members. An emergency management official states that they will often say,

"There's people in the community that probably will need help...if you've got elderly or disabled or, you know, neighbours (who need help)... how you prepare now will mean ... that you'll be safer and that you'll know what to do and you'll know how to help each other in an emergency, rather than having no knowledge at all." – BoP_EM1

The concept of care extends beyond people and includes care for natural resources or cultural artefacts within the community as well. One emergency management official says that they open up community meetings by asking, "why is (it that) you love your community?", which can be for the people, local places and resources that people value. Then they discuss the threats that hazards pose to these community assets and how people collectively can take care of them.

These narratives permeate communities and are often echoed by community members, especially those engaging with emergency management agencies. One community member states that she feels the need to be more prepared to help others, like young university students living in her area, most of whom are new to the locality with limited social connections. She tries to spread the message around.

"I feel like the rest of us, we, have to be a bit more prepared so that if there's a massive earthquake... we might have to help them... So, getting the message out about that" – W_V1

Another participant in Arthur's pass mentions that:

“Just the nature of Arthur’s pass and the fact that it is already an isolated town quite a long way from anywhere else, the locals are pretty well educated about the fact that you know the main fault³³ will go at some stage and we need to be kind of super independent and prepared to just deal with stuff for quite some time... everybody’s gonna come to the party when they need to, but we do need to do probably a little bit more about keeping on top of the resourcing and planning and everything to make sure that we’re absolutely ready” - C_V1.

The narratives on connection and care often invoke identity and expected duties towards neighbours and neighbourhood. For example, one community member notes “kiwis” grow up “with the belief that we are to care for the neighbours, the elderly, the vulnerable...” and a heightened awareness of the AF8 were “the driving force” for him to join the community response teams (C_V8). Similarly, the member of a church group that works with emergency management agencies to improve preparedness in their area noted “we are constantly wanting to say look our mission is to love God and love people but how do we really love people... we support one another within our community...- watching out for one another is definitely something” (S_V1). Such statements connect the uniqueness of the community with what values the community should carry forward, what they should preserve – in this case, their commitment to care and well-being of the community - thus attaching a call to action with their unique community identity.

Introducing collective efficacy in narratives

Collective efficacy beliefs are a major factor in motivating collective action (Agostini & van Zomeren, 2021). To foster a sense of collective efficacy, it is crucial to involve the community in conversations about risk and disaster preparedness (Houston, 2012) and highlight that collective efforts will be effective in reducing disaster risks (Bonniface & Henley, 2008). Traditionally the emphasis of disaster preparedness communication by emergency management agencies and other stakeholders has been individual centric that stresses preparedness as mainly a personal/ family level responsibility with less focus on the collective community components of preparedness (Spialek & Houston, 2019).

However, in the study areas we could trace a shift to incorporate collective efficacy in conversations around preparedness. Statements by officials from emergency management agencies in public meetings repeatedly carried themes implying the residents are capable to take care of their neighbourhood and emergency management officials are “here to help you look after your local community”. Conversations emphasize that while disasters are overwhelming situations, community members have skills and resources that they can pull together to respond better to emergencies. For example, one emergency management official states,

“We pull out a big map and we have them map their assets... they realize how many things that they (have)... They often go oh, we don’t have anything in our community to respond and then suddenly they realize they’ve got all kinds of things in there” – W_EM1

³³ Alpine fault, a geological fault line in New Zealand’s South Island.

Recalling experiences of the community meetings related to preparedness organized by emergency management agencies, one of the participants mentions,

“So, it used to be an approach of we’re Civil Defence, we’ll tell you what to do. Now it’s if X, Y and Z were to happen, what would you do locally? What kind of resources do you have to help yourselves? .. and once you've got those discussions going you find out everyone knows someone that has something.. the community knows that so and so down the road probably doesn’t have that so they'd make that a priority... people actually started to think a bit more about what they could do.. they have most of what they need within their communities to be able to deliver a response.” – S_EM1

These descriptions suggest a change in the approach from “big boys and girls of civil defence” saying “you (community members) sit back, and we will deliver” (C_V6), to civil defence agencies invoking community members’ ability to effectively address many of the community concerns by acting collectively using their own skills and resources. Facilitating conversation on what people can do together remains a major focus:

“One of the big ways we certainly work towards that is with a bit of a strengths based approach.. we don't necessarily know the best way for how people are going to prepare themselves. But we know the communities often have the answers. So, it's often about asking the right questions or encouraging them to think about what things they already have... and thinking about the ways people are already really capable problem solvers.” – W_EM4

Beyond discussions on the community’s ability to be self-reliant, conversations during public meetings, events, and training nights emphasize how the CERT volunteers, street co-ordinators, community agencies, community leaders and the public are all part of “one big team working together” to reduce disaster impacts. During a CERT team meeting, an emergency management official mentioned that “by telling us what is happening in your area (during an event), you give us situational awareness... we can make much better decisions because of that...” thus acknowledging their dependence on inputs from the community volunteers to function better.

The shift in the narratives have also influenced the way in which the community volunteers view their role and contribution in emergency management. A respondent mentioned “we’re at the very low level, we’re only a step up from the general public... but that's what we are in our area” (C_V7). This change is rooted in the evolving understanding of what preparedness means and how people participate in the process at the local level. During a meeting, one of the participants shared how they feel the government agencies “don't have all the staff and resources to be able to get to it (monitoring every hazard)” and so community members need to step up and the “District Council are relying on us to be the eyes and ears” (C_V6). Such conversations enforce the idea that by working together community members can support the emergency management agencies in improving preparedness of their areas.

Tying risk messages with collective responsibility

People's responsibility in preparing for natural hazards is front and centre in the risk governance approach of New Zealand (Blake et al., 2017). Public education campaigns, outreach events, and other communication activities highlight people's responsibility to prepare for adverse events, like "Get your household ready", take part in Shakeout Drill and tsunami hikoi etc., "Get involved" by getting the community ready or by volunteering (McBride et al., 2019; National Emergency Management Agency, 2024c, 2024d). Drawing on the idea of responsibility, collective responsibility in preparing for hazards is another dominant theme.

In Southland and Canterbury, there is an increased emphasis on people to prepare due to the proximity of the Alpine Fault. The outcomes of the AF8³⁴ project have been extensively used by emergency management agencies to raise community awareness of the seismic risk in the area and encourage communities to prepare. By mentioning that it is "not a matter of if but when.." and describing what the impact of a seismic event of magnitude 8 would mean in their local area, officials explain the inadequacy of available resources to cope with its potential effects. They stress that an "all hands on deck" effort is necessary to prepare for such a massive event. For example, one emergency management officer mentions that in community meetings she would say:

"A message that we pushed is we would get FENZ³⁵, St John³⁶, and Police in the room to stand up, and that would sometimes be actually half the group. We'd say these people are going to be needed in an emergency event...if it's major Alpine Fault event they might need to be deployed to other areas in Southland or Otago, so that leaves the rest of you to look after your community. You can't rely on St John, Police and your FENZ members because they're going to be busy, so what are you going to do to make yourself better prepared for this...So, just making that realisation that they're not going to be there to help you so what are you going to do." – S_EM1

This resonates with messages shared in print and digital media like "It's up to you to make sure your whānau and the people you care about know what to do" (National Emergency Management Agency, 2024f) or "after a large earthquake, locals like you should gather at your local Hub to co-ordinate your community's response.." (pamphlet collected in a meeting). Community members often internalize these messages, accept a certain level of responsibility, and share similar messages within their communities:

³⁴ The Alpine Fault in New Zealand's South Island is a major seismic hazard that can generate an earthquake of magnitude 8 or greater and could cause ground shaking, landslides, and liquefaction, leading to severe and far-reaching consequences. To improve preparedness to seismic hazards in South Island of New Zealand, project AF8 was launched in 2016 (Orchiston et al., 2018). As part of the Af8 project, multiple outreach activities were organized like a series of videos about seismic risks were launched in the Radio New Zealand web platform, roadshows involving public talks and school visits were held (<https://af8.org.nz/explore-the-science/af8-roadshow/>).

³⁵ FENZ - Fire and Emergency New Zealand, firefighting, and emergency services agency.

³⁶ ST John – Ambulance service

“We're agreeing to take a degree of responsibility for it on behalf of the town, because we know that this is what happens and we want to change it. So when approaching officials from school boards to encourage preparedness, I guess I'm appealing to his duty and his sense of his, his duty of care to his students and his responsibility to manage health and safety for his students.” – BoP_V1

Another participant mentions how they are close to the alpine fault and that they have “been told if the alpine fault goes.. we will most probably be quite isolated, for a period of time”. In such a scenario, “we may not be able to go to them (civil defence) for every decision that needs to be made” and will need to collectively respond to the event. By highlighting the potential for isolation and the need to be self-reliant to deal with such events, the narratives invoke collective responsibility to prepare for the event. Repeated exposure to such conversations shape people’s beliefs on what can happen and how they are expected to react. The internalization of the message is evident in statements like this: “They tell us there's going to be a big earthquake of some form... and I just want to be aware that I know what I'm going to do to help people” (S_V5); “We need to make sure that we've got everything in line ... they (council) know where we are at and we know what they expect of us” (C_V2).

6.4.2 Navigating tensions and conflicts arising from re-framed narratives

The current narratives focus on what communities can achieve by working collaboratively with governmental agencies. For example, an emergency management official quoted,

“We try to, keep ourselves separate.. we don't buy into any long standing grievances that people have. We say look, we are here to help you look after your local community... if you have a serious issue and you need help in your community, you can tell us and we can prioritize that.” – C_EM2

By clearly communicating what emergency management can offer and what it cannot, this statement carefully sets expectations of what can and cannot be achieved. However, it limits avenues for working on deeper developmental concerns and addressing broader systemic problems that creates risks. This causes tensions among community members who may “feel supported” but question emergency management agencies’ actual “ability to change anything substantially”. Expressing displeasure with the “misplaced priorities” of current preparedness approaches, one volunteer said,

“There is enormous frustration... there is still a degree of two-faced nature – they talk like they get it but in reality they don't.... They live in their own space and do not want to get in the way (to get into conflict with other departments that handle environmental and developmental issues)” C_V8.

Responsibility attribution narratives were found to be particularly problematic. These narratives emphasize that community members should prepare themselves and their neighbourhood for disasters. It largely derives from the perception that people do not prepare due to complacency (National Emergency Management Agency, 2023a). However, in circumstances where community members do not have the resource or capacity to act on the hazard, even when they were willing to prepare, this narrative causes loss of support and goodwill. One participant from a flood prone locality mentions:

“We hear that climate change is going to make things worse and you and your community should prepare...but you can’t actually do anything because you are tied in bureaucracy.. When it rains heavily council says put sandbags but they are not pro-active response to flooding.” - C_V8

Perceptible in his statement is frustration with the government that is asking him to act without providing an enabling mechanism to take up the tasks that they are (told to be) responsible for.

Some participants highlighted how the current narrative that preparedness is people’s responsibility conflicts the response centric narrative around disasters that was prevalent for many years, when emergency management officials did not want civilian involvement in disasters and there “was no value in someone who was not wearing a title or position”. Additionally, some participants find that due to health and safety regulations, “the council is scared that you might hurt yourself and stops you from doing things”. The lingering response centric narratives and the risk averse approach of some government departments creates hesitation and confusion among community members, often dissuading them from participating in collective initiatives.

6.5 Discussion

The findings support previous research that show narratives make messages on disaster risks understandable, engaging and personally relevant by embedding them in the local context (localized), talking about people’s lived experiences (personalized) and using vivid descriptions (dramatized) (De Meyer et al., 2020; Lejano et al., 2023). Narratives often capture information that are lost or difficult to express in logical, rational argumentation and written documentation (Sauer, 2003). They help in viewing the world from different perspectives, enable meaningful discussion on experiences that are not common (like disasters) and support community interactions with emergency management agencies and stakeholders (Pstross et al., 2017). Instead of instructing people on what to do, the fluid and contextual nature of conversational narratives allow community members to discursively negotiate their role within the emergency management system. This approach helps them identify realistic, actionable steps that they can take, while respecting their aspirations and skills – thereby breaking a lack of agency and empowering people to decide for themselves (De Meyer et al., 2020).

The study identified four main themes in the narratives shared by emergency management agencies in the pre-disaster stage – connection and care, everyday heroes, collective efficacy, and collective responsibility. The connection and care narrative encourages people to form social networks and informal relationships in pre-disaster situations. Research indicates that cultivating networks of mutual aid and support enhances community connections, cohesion and social capital, which plays a crucial role in building resilience (Aldrich & Meyer, 2015; Matheson & Jones, 2016).

Information, awareness and concern do not lead to action in the absence of agency (De Meyer et al., 2020). The everyday hero and collective efficacy narratives are valuable because they emphasize agency, underscore personal autonomy, and encourage people to take actions for attaining intended outcomes (Bandura, 1995; De Meyer et al., 2020; Jones, 2014). Aligning with prior studies, we find that promoting everyday heroism is likely to help people recognize their role, value and potential to make positive social change in their communities by reducing disaster risks (Keczer et al., 2016). Also, people

are asked to contribute based on their capacities and skills, which respects local capacities while avoiding putting anyone in unnecessary danger.

Promoting these narratives, however, becomes challenging as they conflict people's mental frames and perception of disasters. The current narratives diverge from the conventional view of emergency management as a top down, response centric approach that dissuades people's participation. To support a transition to new narratives that encourage pre-disaster civic participation, it's essential to emphasize that our understanding of disasters is evolving and being explicit about the rationale for the transition, instead of introducing the new narratives abruptly.

Additionally, some narratives fail to resonate with community members' experiences, evoking feelings of helplessness, frustration, apathy, or antagonism. To avoid this, it is crucial to maintain narrative fidelity, which means that for narratives to be engaging and trustworthy, they should resonate with people's experiences, beliefs, and values (Baesler, 1995). In a multicultural environment like New Zealand with diverse population groups who possess varied lived experiences, beliefs, and values, maintaining narrative fidelity is challenging. To address this, documenting lived experiences and insight from individuals, and communities and carefully crafting narratives that reflect the contextual realities, engage people and empower them is important (Hou, 2023). Encouraging community champions and leaders to share their lived experiences, and highlighting stories of positive deviance, where local individuals and groups have independently developed innovative solutions to reduce disaster risks hold value (Marsh et al., 2004). While it is natural for narratives and counter narratives to emerge (Agrawal et al., 2022), there is a need to ensure that subaltern voices are not dismissed or subdued and their narratives are included and present in the broader discourse (Dutta, 2018). It is crucial to critically reflect on which narratives are prioritized, acknowledge counter-narratives, and present different sides of an argument to ensure that narratives do not inadvertently disempower people.

We find the collective responsibility narrative is particularly problematic in situations of resource constraints. People can adopt protective actions based on risk information only when they have the opportunity and capability to do so (De Meyer et al., 2020). When people's actions are constrained due to lack of assets, competencies, resources or lack of power because of regulatory or political mandates, there is little benefit of risk communication (Buchtman et al., 2023; Lejano et al., 2023). Rather it causes economic strain and mental burden in people who are unable to prepare for failing to meet the expected social standards (Baker & Grant Ludwig, 2018; Blake et al., 2017).

Additionally the current strategy of transferring responsibility of personal safety to individuals themselves is an agenda of a neo-liberal approach to risk management that shifts the burden of risk from state to people and sets social standards people should fulfil (Bell, 2010). This approach depoliticizes risk by placing responsibility on individuals themselves, disconnecting it from the political, economic, and social factors that creates the risks in the first place. The consequence of not looking at developmental problems and long-standing grievances is that it shifts focus from the systemic roots of disasters, depoliticizes risk, delegitimizes community voices that demand government oversight, involvement and accountability, and closes paths of identifying transformative solutions towards building resilience (Mosurska et al., 2023).

Following communication infrastructure theory (Kim & Ball-Rokeach, 2006a), we argue that to improve the effectiveness of current communication approaches and pre-disaster narratives, it is crucial to

consider issues of resource mobilization as well (refer Resource Mobilization Theory by McCarthy & Zald, 1977). The initial steps in attaining this can be in the form of providing information on where people can find and secure resources and offering financial and operational support from emergency management agencies and councils. However, in the longer term the discourse on emergency management needs to engage with issues of inequity and systemic barriers that creates challenges in accessing and mobilizing resources and discuss how appropriate bureaucratic and policy provisions can be made to support transformative enabling environments. This should happen through partnerships and sharing of responsibility with communities where communication is leveraged to support these changes, instead of responsibility transfer approach.

There is also a need to examine the ethical implications of using narratives in disaster and risk communication. Narratives suppress counterarguing (Shen & Edwards, 2023) and are inherently persuasive in nature as the story justifies the claim (Dahlstrom, 2014). It is important to ensure that the narratives are used cautiously, lest they become tools for manufacturing compliance. Particularly, attention needs to be paid that they are not used “asymmetrically to disseminate top-down information rather than involving authentic voices and agency from people” (Hou, 2023, p. 184). As narratives are increasingly being adopted, it is crucial to establish ethical guidelines on their framing and application. These guidelines should establish that a high degree of accuracy and fairness is maintained, develop a common understanding of when the use of narratives are ethically justifiable and ensure that using narratives do not undermine people’s autonomy to make choices (Dahlstrom & Ho, 2012).

The literature review shows that existing understanding of disasters, particularly that shaped through mass media narratives, are inadequate to foster civic participation and collective action for disaster preparedness - a new narrative that promotes citizen agency, collective efficacy, and promotes shared responsibilities is needed (Sayers et al., 2023; Shanahan et al., 2019). As such, emergency management agencies are increasingly sharing narratives that reframe the pre-conceived notions related to disasters – like who is valuable in disasters, how people can be valuable in disasters and why people need to engage in preparedness collectively. However, it is important to ensure that this message is also reflected in mass media to maintain synergy and avoid confusion. Working closely with journalists, science communicators and other stakeholders, promoting the adoption of a disaster preparedness and mitigation angle highlighting the voice and role of local people will be beneficial (Matheson & Jones, 2016; Scanlon, 2011).

While mixed opinion exists on the effectiveness of narratives (Dillard & Shen, 2013; Golding et al., 1992; Oschatz & Marker, 2020), drawing on our data, we find that some are narratives valuable while others are problematic. We argue that the effectiveness of narratives compared to rational messages vary and rely on the quality of the narrative (how they are framed, how they reflect people’s experiences etc.) and the context where they are applied (Morris et al., 2019). Future research can explore the factors that influence the acceptability and effectiveness of narratives in the disaster context. Additionally evaluative research examining the long-term impacts of narratives would be beneficial. Narratives can also become tools to promote dominant voices while dismissing or erasing marginalized voices (Lejano et al., 2023). While this research was not focused on under-represented groups, during the research we identified a lack of diversity in narratives accounting for different worldviews, historical, social and cultural settings. Studying narratives from a critical perspective

exploring how diverse groups relate to these narratives, how these narratives align with communication programmes designed for specific groups (like indigenous people, culturally and linguistically diverse communities), what concerns exist hold value. Research is also required on the ethical implications and potential misuse of narratives in disaster and risk communication.

Research on the role of narratives in generating disaster awareness and promoting individual preparedness is growing. However, our understanding of narrative in promoting civic participation and collective actions remain in its infancy. The paper contributes to this gap by documenting how narratives are adopted in emergency management communication along with rational communication approaches to promote civic participation and collective actions. The paper also advances our understanding of narratives as communicative elements that can encourage civic participation (Kim & Ball-Rokeach, 2006a), enhance social capital (Chamlee-Wright & Storr, 2011) and contribute towards improving resilience (Houston, Spialek, et al., 2015). The findings hold value for emergency managers, local and regional authorities, communicators and informs communication research on resilience.

6.6 Conclusion

Emergency management agencies are increasingly engaging with communities to promote disaster preparedness through communicative interventions like meetings, workshops, storytelling exercises, to community champions programmes that encourage conversations and dialogue (Ryan et al., 2020). These conversations are not structured as scientific rational arguments, rather they flow as stories and narratives shared discursively by emergency management agencies and community members. This paper examined these narratives and explored how they encourage civic participation and collective action, what the dominant themes are in the narratives, how communities interpret and engage with them, and which narratives lead to conflicts and tensions.

Four main themes are identified in the narratives – connection and care that encourages people to stay connected, maintain informal relationships and care for their community; everyday heroes that highlight the value of simple everyday actions during situations of emergency, expanding the idea of heroism beyond physical stance heroes to anyone who support emergency management operations by caring for their communities' well-being and taking proactive measures; collective efficacy that suggest that community members can work together effectively to achieve common risk reduction goals; and a collective responsibility theme that highlights community's shared obligation to collectively address risks facing their community. These narratives reframe the understanding of disasters, from a narrow response centric view, often propagated through mass media reports of disaster response, to a broader recognition disaster risks and preventive actions.

The narratives have potential to promote community agency, enhance social capital, and motivate collective actions. However, they also pose some challenges, such as confusion arising from contradiction between the lingering response-centric narratives and the current community action centric narratives, frustration over collective responsibility narratives that urge action without addressing concerns about resources and capacities, and resistance to current narratives perceived as attempts by emergency management agencies to reduce their responsibilities. To address these challenges, there is a need to critically reflect on issues of narrative fidelity, resource access and ethical considerations. We hope that by addressing these issues, narratives will become a more useful tool for disaster and risk communication, which fosters meaningful civic participation and collective action.

Chapter guide

Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.		What are we studying?
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study		How are we studying it?
Chapter 4 Civic participation & collective action	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Existing communication practices	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Communication content	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Emerging areas of communication	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Chapter 7 Exploring social media functions in the pre-disaster stage: Enhancing preparedness, supporting community actions, and addressing key challenges

Background: This chapter presents the last manuscript of the thesis. The overarching aim of the thesis was to understand the communication practices that promote people's participation in collective actions for disaster risk reduction. The data revealed several references to social media, particularly Facebook, as a digital communication infrastructure used by community communicators to share information and engage with communities. Interestingly, social media platforms, like Facebook, are built on relational network-based communication where a network of users connect with each other as friends and followers, share content and collaborate around shared goals. Therefore, building on the previous chapters' focus on relational communication approaches, in this chapter I explore how a communication infrastructure built on relational networks support people's participation in collective actions for disaster risk reduction. Specifically, this chapter examines on the role of Facebook, in promoting civic participation and community actions in the pre-disaster stage and the challenges associated with its use.

The manuscript is currently in submitted status: Das, M., Becker, J., Doyle, E. E. H., & McBride, S. (2024). Exploring social media functions in the pre-disaster stage: Enhancing preparedness, supporting community actions, and addressing key challenges.

Abstract

Given the widespread adoption of social media in everyday communication, understanding its use before, during, and after disasters is crucial. While post-disaster social media usage is well-studied, its pre-disaster uses remain under-researched. This paper seeks to address this gap. Utilizing a qualitative case study, the paper documents social media functions in the pre-disaster stage. Facebook emerged as the most used social media platform for pre-disaster communication. Its functions include providing and receiving disaster information and warning, maintaining preparedness in community discourse and being a communication resource for volunteers. It is utilized for preparedness communication, reaching people not actively seeking disaster information, connecting with specific groups of people, establishing trusted communicators, sharing warnings, gaining situational awareness about hazards from communities, generating dialogue on preparedness, fostering community connections and conversations, preserving collective memories and serving as platforms for volunteers to communicate and learn. The findings indicate that while social media in itself do not trigger civic participation and collective action in the pre-disaster stage, it plays a supporting role by being a community communication resource. The main challenges include digital divide, differences in usage based on audience and the platform's effectiveness in prompting preparedness actions. The findings emphasize that using local community pages on social media and engaging local people as communicators on these platforms offer numerous benefits. The theoretical and practical implications of the findings are presented.

Key words - *Social media, disaster preparedness, community participation, collective action*

7.1 Introduction

Social media has transformed everyday communication. Websites like Facebook have 2.989 billion active global users monthly (Dixon, 2023) with around 3 million in New Zealand (Kitchin, 2023). When considering all social media platforms like Instagram, Twitter, Tiktok, 81.4% of all New Zealanders are active social media users (SocialMedia.org.nz, 2023). Given the widespread use of social media in today's world, including in emergency situations (Knuth et al., 2016), it is necessary to explore the optimal ways to leverage these platforms to communicate with the public before, during, and after disasters (Buzzelli et al., 2014). While substantial research examines social media usage when an event is imminent, during and after the event, there is limited research on its use prior to an event in regular communication (business as usual) for preparedness and mitigation (Eckert et al., 2018; Ghosh et al., 2018; Nazaruddin, 2020).

Embracing social media platforms in the pre disaster stage is necessary to improve pre-disaster communications and enhance emergency response capabilities. Social media messages, when designed and disseminated carefully, can quickly reach a wide audience (Neely & Collins, 2018). It supports two-way communication, allowing citizens to actively participate in emergency management processes (Paton & Irons, 2016) with less costs compared to conventional communication strategies. In the pre-disaster stage, social media can be utilized to share emergency preparedness information and engage with people wanting to reduce their risks. Social media also enables individuals, communities, and agencies to establish connections and networks with different stakeholders and the public. During crisis, these familiar networks can be leveraged to collect real time information, offer support, and mobilize resources (Merchant et al., 2011). Considering the potential of social media, we wanted to explore how it is currently used in the pre-disaster stage to encourage individual and collective actions for reducing disaster risks and what factors need to be considered for using it effectively.

7.2 Social media in pre-disaster stage

7.2.1 Social media and pre-disaster communication

Social media allows people to create, share, and exchange information, experiences, and perspectives in the virtual world using online platforms and technologies. It includes a range of Web 2.0 applications like social networking sites (Facebook, LinkedIn), media sharing sites (Youtube, Instagram, Tiktok), blogs (Wordpress, Blogger), microblogs (X formerly Twitter), discussion forums (Reditt), conversation platforms (WhatsApp, Microsoft Teams, Zoom etc.), wikis (Wikitravel) and others (Fraustino et al., 2012; Montag et al., 2021). They are user-friendly cost-effective platforms for high-volume communication in various media formats (audio, video, informative images, animated maps, etc.) that allow engaging and interactive communication (Tang et al., 2015). As social media allows anyone with devices (like computers, smartphones, tablets) and functional internet connection to engage at their own convenience without limitations on user location (Austin et al., 2012), it is suitable for engaging with individuals from a wide area, irrespective of time and availability constraints - thus complementing conventional public communication approaches (Wukich, 2016).

Studies on social media use in disasters exist for almost every disaster that has occurred in the last ten to fifteen years (Reuter & Kaufhold, 2018). Studies on its use in the pre-disaster stage can be

categorized into two groups, i) social media during an imminent threat, and ii) social media during the non-threat periods.

Research that examines social media when a threat is imminent studies social media use by different actors like emergency management agencies, organizations, and general public before emergencies. e.g. to issue warnings, gain situational awareness etc. (Cool et al., 2015; Ghosh et al., 2018; Yan & Pedraza-Martinez, 2019). These studies examine the themes in the messages (Kurian & John, 2017), usage patterns (Neely & Collins, 2018; Yan & Pedraza-Martinez, 2019), complexity of the messages (Pogrebnyakov & Maldonado, 2018), challenges in using social media including misinformation/disinformation (Sultan & Maharjan, 2022), considerations and best practices when using social media (Andrade et al., 2020; Nemeskey & Kornai, 2018).

Comparatively limited literature exists on social media application in non-threat periods for promoting long term preparedness and mitigation. While some studies highlight the benefits of social media in this stage (Perera et al., 2021; Veil et al., 2011), there is a lack of understanding of its actual adoption in emergency management communication practices and the associated challenges (Dufty, 2015; Eckert et al., 2018; Knuth et al., 2016; Nazaruddin, 2020; Rasmussen & Ihlen, 2017). For example, Alexander (2014, p. 730) highlights that it is important to understand “the role of social media in the long periods dominated... by mitigation” and how to “incorporate social media into these processes”. This drives our first research question:

RQ1: How is social media adopted in the pre-disaster stage for disaster and risk communication, particularly in non-threat periods?

7.2.2 Social media functions in the pre disaster stage

Social media and risk communication

Compared to traditional media, social media offers multiple benefits. It supports two-way communication among government agencies, research organizations, NGOs, and community members where all stakeholders are both producers and consumers of the communication outputs (Houston, Hawthorne, et al., 2015; McBride et al., 2020). It allows feedback, which is important to generate engagement (McBride & Ball, 2022). For example, during the pre-disaster stage community members can take photos with mobile phones showing a problematic situation (Bray et al., 2023). It informs the officials what to act on and helps in understanding community’s risk concerns, differences in risk perceptions and where more communication efforts are needed. Thus, it can inform public education and outreach design. Social media also has the capacity to inadvertently connect users with disaster information without actively seeking the information (Houston, Hawthorne, et al., 2015). Such exposure sometimes triggers users to seek further information in official channels and traditional media (Austin et al., 2012), thus amplifying the reach and visibility of disaster information. In exceptional situations like COVID 19, social media offers an alternate to in person communication (Adu Gyamfi & Shaw, 2022). Additionally, disaster specific applications gain low interest because of their limited use once in a while (Reuter et al., 2017). Social media, on the other hand, is used by many consumers in their day-to-day life for achieving different tasks, thus maintaining user interest (Dixon, 2023). The responsibility to maintain them do not fall on the government agencies or the end users, thus not financially constraining and more likely to be sustainable than tools designed for single purpose. Multiple studies recommend that emergency management agencies and related

stakeholders establish a social media presence and integrate it into their daily operations for optimal effectiveness during crisis situations (Andrade et al., 2020; Eckert et al., 2018; Scott & Errett, 2018; Veil et al., 2011). Recognizing these benefits, officials are increasingly adopting social media in disaster and risk communication practices.

Currently, social media is used to raise awareness on risks and recommended actions (Kaufhold & Reuter, 2016; Kirby et al., 2023; Wukich, 2016). In situations of imminent threat, social media is used to provide information about the evolving hazard situation, possible impacts and recommended actions. It acts as a geo-sensor network (Joseph et al., 2018), that monitors and detects what is happening in an area, helps to gather latest information, gain situational awareness and broadcast time critical information to stakeholders (Tang et al., 2015; van Gorp et al., 2015). In protracted disasters which have a long pre-event stage, government agencies have used social media for rumour control (Tang et al., 2015). Organizing these, the functional framework on social media identifies four main social media functions in the pre-disaster stage – i) providing and receiving disaster preparedness information, ii) providing and receiving disaster warning, iii) signalling and detecting disasters, and iv) implementing traditional crisis communication activities (Houston, Hawthorne, et al., 2015).

Social media also has an agenda setting³⁷ potential which generally resides with the mass media (McCombs, 1977). When conversations are unidirectional from mass media to the people, the agenda setting power remains with the mass media. Social media challenges this by allowing users to join conversations, guide what is being talked about, start new conversations and set the agenda on issues more relevant to the community (Alexander, 2014). It can also be used to share alternate narratives and perspectives on hazards. For example, a case study on the ‘Info Merapi’ demonstrates that users availed the platform to share contrasting narratives of Mount Merapi as beautiful against mainstream media's portrayal of Mount Merapi as dangerous, by emphasizing the prolonged periods of normalcy over short eruption events (Nazaruddin, 2020). The platform enabled people to share their traditional beliefs of Mount Merapi as a sacred power and values of living in harmony with the nature against the mainstream discourse of Mount Merapi as hazardous.

However, social media continues to be underutilized in non-threat periods and its adoption is still ad-hoc (Bennett, 2014; Kirby et al., 2023; McCormick, 2016; Möller et al., 2018; Neely & Collins, 2018; Wukich, 2020). This drives the second research question:

RQ2: For what functions and uses is social media adopted in the pre-disaster stage?

Social media and civic participation

Establishing relationships with community members is crucial to improve community readiness and ensure that people act on warning messages and preparedness advisories (Kim et al., 2021; Lejano et al., 2023). While in person community engagement is desired, it is often restricted due to financial and staffing constraints (Ryan et al., 2020). Social media offers a platform for two-way communication (asking questions, seeking information) instead of one-way communication of public education campaigns or social marketing approaches (Tang et al., 2015). Such two-way communication with continued presence in virtual platforms is key to build trust and confidence in public agencies (Kim et

³⁷ Agenda setting – that we should think about, importance and prominence of various issues or topics

al., 2021; Prior & Paton, 2008). It also helps in creating new connections and social networks that can be leveraged during emergencies (Dufty, 2012; van Gorp et al., 2015). Studies show that such community engagement and ongoing discussions about risks help community members understand hazard risks, develop a shared sense of responsibility, and identify ways to collaborate in reducing those risks thus fostering collective preparedness actions (Dufty, 2012; Pfefferbaum, Pfefferbaum, et al., 2013; Prior & Paton, 2008).

Social media supports the formation of virtual communities (Mullan et al., 2022; Peeters & Pretorius, 2020) including emergency preparedness communities (Dufty, 2015). These communities undertake various risk reduction activities like promoting preparedness at the community level, collaborating with different stakeholders to implement risk reduction actions etc. While studies have documented the emergence of virtual groups post-disaster and their use of social media to support community participation and collective actions by allowing people to establish connections, organize volunteers, seek donations, and mobilize resources (Bhuvana & Aram, 2019; David et al., 2016; Nissen et al., 2021), there is limited research exploring how social media is utilized during the pre-disaster stage to promote civic participation, organize volunteers, and support collective actions (Comfort, 2016). This leads to the third research question:

RQ3: What is the role of social media in the pre disaster stage in supporting civic participation, and collective action in preparedness?

7.2.3 Challenges of social media

A major challenge lies in the lack of credibility of social media. Often misinformation, disinformation, and outdated information, whether shared intentionally or unintentionally create confusion, panic or outrage (Hughes & Palen, 2009; Knuth et al., 2016; Plotnick et al., 2015). As such, individuals tend to obtain news from mass media, official channels, and trusted sources like friends and family (Endsley et al., 2014). Recent studies identify that self-correction occurs³⁸ in social media, and is more likely to happen when there are credible and reliable members active in the social media (Bennett, 2014) like admins and moderators of social media groups (Alexander, 2014). However, in the pre-disaster context, misinformation was considered as less of a problem than in the post event stages (Dufty, 2015).

There is also a gap between the social media content shared by government agencies and citizen's information needs (Jha et al., 2016). People have different experiences and perceptions of disasters, and contextualizing information is necessary (Eckert et al., 2018; Tampere et al., 2016). There is also a need to identify the social media channels that community members engage with, and maintain presence there to increase reach and spread of messages (Wukich, 2020). Furthermore, while communication using social media is important, rampant use of social media is not likely to improve preparedness communication as it can cause information overload³⁹ and user disengagement (Austin et al., 2012; Hughes & Palen, 2009; Plotnick et al., 2015). Dealing with these factors require

³⁸ Self correction – Social media users correcting incorrect information, e.g. by fact checking,

³⁹Information overload – When information received exceeds a person's capacity to absorb the information leading to difficulty in processing it and feeling overwhelmed Fu, S., Li, H., Liu, Y., Pirkkalainen, H., & Salo, M. (2020). Social media overload, exhaustion, and use discontinuance: Examining the effects of information overload, system feature overload, and social overload. *Information Processing & Management*, 57(6), 102307.

prioritization and personalization of information which, while easy to recommend, is difficult to practice.

At the operational level, unavailability of resources (Hughes & Palen, 2009) lack of staff skilled in social media communication, technical difficulties and unfamiliarity with the new technology create doubt and reluctance in social media adoption among emergency management agencies (Bennett, 2014; McCormick, 2016; Plotnick et al., 2015; Wukich, 2020). Additionally, a of lack of training, knowledge resources, guidance, and policy documents on social media use (Plotnick et al., 2015), ethical concerns around privacy and security of social media persist (Alexander, 2014; Knuth et al., 2016; Luna & Pennock, 2018). The issue is complicated by the fact that social media platforms themselves can change due to changes in management, technological advances and other factors which can significantly affect communication practices that rely on them. e.g. platforms like X have recently undergone substantial changes which have negatively affected science communication practices (Insall, 2023). Given these concerns, the use of social media continues to be largely ad-hoc (Houston, Hawthorne, et al., 2015).

Another serious challenge relates to digital divide. It refers to disparity among people in access or ability to use information and communication technologies, such as internet, smartphones, and electronic devices (Cullen, 2001). Many people, particularly from lower income groups and minority backgrounds, have limited or no access to social media (Bennett, 2014; Dargin et al., 2021; Luna & Pennock, 2018). Elderly people might not be comfortable with social media (Sawangnate et al., 2022). Accessibility issues restrict use of social media among persons with disabilities (Ellis & Goggin, 2013). These limit the usability and reach of social media.

Luna and Pennock (2018) categorize the challenges in two categories - social challenges, and technical challenges. Social challenges include interoperability issues (quality of information, spread of rumours etc.), demographic considerations (age, ethnicity, education level, gender) and stakeholder universality and social stratification. Technical challenges include lack of regulations (standard, policies etc.), social media monetization, resource allocation, security concerns etc. We aimed to understand the key challenges in social media use in pre-disaster communication which led us to our fourth research question:

RQ4: What are the considerations when using social media in the pre-disaster context?

7.3 Methods

Qualitative case study (Guetterman & Fetters, 2018; Stake, 2010) of four locations from New Zealand, Edgecumbe (Bay of Plenty) Mt Cook (Wellington), Arthur's Pass (Canterbury) and Gore in Southland was conducted. These locations have varied demographic characteristics and hazard history and were suitable for cross-case analysis.

Thirty-five (35) interviews of approximately 1 hour were conducted between February 2022 and September 2023 with emergency management officials, representatives of community-based organizations and community leaders and members engaging in collective preparedness actions (Table 7.1). A semi-structured questionnaire was used with interview questions exploring how social media platforms are used in pre-disaster communication, effective strategies for encouraging civic participation and collective preparedness, and related challenges or considerations. Thematic analysis was conducted (Braun & Clarke, 2012). Interviews were transcribed and loaded in NVivo. Open coding

was done. The codes were consolidated to identify candidate themes before refining them into the final set of themes.

Interview participants identified some social media pages as frequently used by them. These included Facebook pages of four regional emergency management agencies, one community organization from Bay of Plenty, and two Facebook community groups, one in Edgecumbe (Bay of Plenty) and Selwyn (Canterbury) each. So, we observed posts between June 2022 and September 2023 in the profiles and took observational notes. We were not examining quantitative indicators (e.g. liking, sharing), rather we aimed to understand the functions for which the platforms are being utilized by looking at the messages shared, entities sharing the messages and the ensuing dialogue (Bennett, 2014). The observational notes were used to triangulate the interview findings. Member checks with interview participants were conducted to ensure the themes were credible (Creswell & Poth, 2016).

The Massey University Ethical Code of Conduct was followed. This research received a Low-Risk Ethics Notification Number of 4000024945. Informed consent was obtained in an online form and no potentially identifiable images or data are presented in the study.

<i>Area</i>	<i>Participant profile and participant codes</i>	<i>No. of participants</i>
Bay of Plenty	Volunteer in collective preparedness (BoP_V1 to BoP_V4)	4
	Emergency management (CDEM) official (BoP_EM1)	1
	Official from district council (BoP_EM2 & BoP_EM3)	2
	NGO personnel assisting in collective preparedness (BoP_N1 & BoP_N2)	2
Wellington	Volunteer in collective preparedness (W_V1 to W_V5)	5
	Emergency management (CDEM) official (W_EM1 t W_EM4)	4
Canterbury	Volunteer in collective preparedness (C_V1 to C_V8)	8
	Emergency management (CDEM) official (C_EM1)	1
	Official from district council (C_EM2)	1
Southland	Volunteer in collective preparedness (S_V1 to S_V6)	6
	Emergency management (CDEM) official (S_EM1)	1
	<i>Total</i>	35

Table 7.1 – Participant profiles, and identity codes used herein.



Figure 7.1 – Map of the study areas in New Zealand.
Created using SnazzyMaps (<https://snazzymaps.com/>).

7.4 Findings

The findings are divided into three sections - social media in the pre-disaster stage, its functions and considerations.

7.4.1 Social media in the pre-disaster stage

Facebook was the most widely used platform as evident in statements like “our biggest social media is Facebook” (W_EM4), “we do have a Facebook page” (S_V5), “Facebook is sort of the one we use the most... We do have Twitter, YouTube and Pinterest as well, although they are not that active anymore” (C_EM1).

Two forms of Facebook pages are used – i) official pages of organizations, and ii) community group pages. Pages maintained by organizations, like emergency management agencies and community-based groups, are utilized to share emergency management information, news, advertise activities, and engage with the public. Personnel managing these pages vary - some organizations have full-time public information managers and communication teams, while others assign this responsibility to individuals with other primary roles. For example, an official mentions that, “we don't have specific

teams that do that...there's three of us, we're the ones that are in charge of that... If we've got something big... we tap into their (another department) comms team" – S_EM1

Community group pages are used by officials as well as local people to share information and resources. Two pages that featured prominently in the data were the Edgecumbe community group page⁴⁰ (ECP) and the Selwyn community response team page (SCRT) respectively. ECP is a public group created in response to the Edgecumbe floods, 2017 by group of locals for coordinating the cleanup task (Shanks, 2023). The group quickly grew, secured donations and supported the community recovery process. Overtime the group transformed into a platform for the locals to share information, event updates, offers services, seek advice and recommendations. The group currently has over 7300 members. SCRT is a private group created by the Selwyn district council in 2017 for the community response team⁴¹ (RT) volunteers. It is used to share training updates, news and hazard warnings. The group currently has approximately 280 police vetted members. Both ECP and SCRT are used by officials, local people and response team volunteers for disaster and risk communication, including sharing hazards and preparedness information, warnings, updates and various resources.

7.4.2 Functions of social media in the pre-disaster stage

The findings show social media is used for four main functions - provide and receive disaster preparedness information, provide and receive disaster warnings, maintain community discourse on disasters and preparedness, and being a communication resource for a community of practice.

7.4.2.1 *Providing and receiving disaster preparedness information*

Agencies utilize social media for disaster-related public education and to promote events, meetings, projects, and other preparedness activities within the community. Outlining this, an official mentions,

"We have a Facebook page... we use for all our advertising of our hui (meetings), or newsletters, our collective activities... to inform the community that they're invited to hui (meetings), or projects are happening, if they're interested in coming along to them." – BoP_EM2

Sharing in local community pages is especially useful to reach people who are not actively seeking disaster information. For example, ECP is used by locals in their everyday lives to gain local information, share updates, and build connections. As it is not exclusively for emergency management, it has more people with diverse interests in it. When volunteers post preparedness information like "Drop, Cover, and Hold" or reminders about emergency grab bags, people who are not actively seeking disaster information still encounter it. This incidental exposure improves the visibility of preparedness information, reducing the burden on emergency management agencies and volunteers to actively build interest.

⁴⁰ The community group name has been anonymized.

⁴¹ RT is a group of trained volunteers organized at the community level to assist in emergency situations. They are supported by the local government or emergency management agencies and their primary goal is to provide immediate assistance to individuals, families, and neighbourhoods during the initial phases of a disaster before professional responders arrive.

Social media platforms are also useful to reach temporary residents like seasonal workers and migrants, who may not be integrated in the local social networks, rather more likely to be on virtual platforms which have low entry barriers (Plöger & Becker, 2015). Therefore, virtual platforms become an important avenue to communicate with temporary residents, who are less likely to be aware of the hazard history and recommended preparedness actions due to their lack of experiential knowledge. Highlighting this one participant says how she has “seen a new change of different ethnic groups” in their region, and “they're probably on social media”, so she is considering “how can we improve this (social media communication) as a new opportunity” (BoP_EM2).

Organizations need to establish community presence before a crisis (Kim et al., 2021; Veil et al., 2011). Social media platforms provide a suitable avenue to attain this. Often people who are dissatisfied with conventional media, particularly the younger generation, rely on social media, to seek information (Lam et al., 2017; Paton & Irons, 2016). By building trust and engaging in ongoing dialogue through official pages or community pages, organizations can establish themselves as reliable communicators ahead of emergencies. It enables them to swiftly address misinformation, rumours and combat political or commercial propaganda during emergencies (Alexander, 2014). For example, an official notes that social media enables “our team... to jump online and answer questions” (W_EM2).

7.4.2.2 Providing and receiving disaster warnings

The quick turnaround time makes social media an attractive option for sharing time-critical information, like hazard warnings. An emergency management official mentions that when “the flood warning comes we push that out to all of our groups... put it on website, Facebook etc.”. Multiple participants recalled receiving warning from social media, that prompted their actions. For example, a volunteer says, “When we had those earthquakes late last week... I'd seen that on Facebook, I immediately sent that to the community response team” and acted on that information (BoP_V1).

Local people utilize social media to share situational awareness of hazards. In Selwyn, during hazard events when the Emergency Operations Centre is activated and internet is still operational, the volunteers submit Situation Reports (sitreps) from their areas in the page that are visible to RT volunteers across the region. This creates another “simple way to find out how everyone was doing, where should they be sending their resources”, which was a “big gap” in prior emergencies (C_EM2). Another official mentions that while “a major construction of the embankment” was happening, the community “needed to keep an eye on it because it was still at a vulnerable state until it was fully completed” so, “the community manage(d) it themselves by going over to the river to look at it... post in social media that the river is up... Warn them about the river, things that are flooding...” (BoP_EM2).

7.4.2.3 Maintaining community discourse on disasters and preparedness

Disasters are not an everyday concern for most people (Meyer & Kunreuther, 2017), making it challenging to engage the public in conversations about disasters using conventional communication approaches. Posting about preparedness on social media pages that people frequent help in “stirring the pot occasionally”, cueing people to think about disasters without making it a serious or difficult conversation. A volunteer shares,

“Every time we have a meeting (RT team meeting)... I'll just go and put up a random post... I'll just say what is your grab bag looking like? Have you talked to your family... just randomly putting it in there?” – BoP_V1

As people engage with this content and share their perspectives, experiences, and stories, a collective awareness of the local risks and necessary actions form. This shared understanding extends beyond online interactions to offline neighbourhood conversations, making disaster and preparedness a part of the broader community discourse. It is noteworthy that the ECP page in itself is a digital artefact commemorating the 2017 floods and the post-flood collective action. The page “caught what had happened there (during the floods)” and the long-term recovery over the past five years, preserving the flood history in the collective memory.

Social media “draws a lot of dialogue” (W_EM2) compared to conventional media. Sometimes, community members with questions might “message and ask us (officials) to come and meet with them” (S_EM1). Connections established through these conversations create new opportunities for officials to gain access to the communities and engage in in-person relationship building activities. These connections and relationships are key to form networks of neighbourhood champions who can promote disaster preparedness conversations and activities within their communities.

7.4.2.4 Being a communication resource for a community of practice

Social media provides an accessible platform for volunteers to engage with each other. For example, Selwyn district comprises of many geographically remote communities. Arranging frequent in person meetings among the RT volunteers is difficult. Recognizing this, the social media page was created by a local official to serve as a communication platform for the volunteers to exchange information, ideas, or messages, at their convenience and build connections across the region. By eliminating the need to coordinate logistically intensive in-person meetings, it lowers entry barriers. As “all community response teams can see what's happening throughout the whole district, not just us (government officials)” (C_EM1), there is greater situational awareness and transparency which enables volunteers and officials to effectively collaborate.

The pages also allow the volunteers to reach a wide audience using engaging contents in different formats (audio, video etc.), which is difficult otherwise. A volunteer comments,

“It's such a tangible way of showing people what's going on... we've got a huge plan that's in document form and then we summarize that into a plan... I put a couple messages on ECP, so they (community members know) this is what's coming” – BoP_V1

The group serves as an online learning platform for the volunteers where they can observe how things are currently done, converse about it and identify what can be improved. For example, in Selwyn, during November the community response teams hold emergency management exercises in their respective areas and post updates on the Facebook page. The posts with information, photographs, feedback, and suggestions, help to generate ideas and identify different ways in which the exercises are being organized and recognize avenues to improve existing practices. Volunteers also seek guidance from others organizing similar activities. A volunteer states,

“People just put it on the Community Response Facebook page, so then everybody, all the Community Response people, like us, can see it. If we see something that's appropriate for our area, then we can go and post it on wherever we need to if we want to.” – C_V6

Thus, the page serves as a social learning platform⁴² for people who are situated in different geographic areas but interested in the same cause of disaster preparedness. Additionally, the collective spirit shared across the platform and “seeing others do it” encourages and uplifts the morale of the volunteers who devote considerable time and efforts to organize preparedness activities and exercises. Highlighting the value of such pages, one volunteer notes “that was an incredible resource for everybody” (BoP_V1).

The following table summarizes the role of social media in the pre-disaster stage as observed in our data:

<i>Function</i>	<i>Uses</i>
Providing and receiving disaster preparedness information	Communicate information on hazards and recommended actions
	Connect people who are not seeking disaster information actively
	Connect with specific groups who are not connected with other communication channels
	Establish trusted communicators ahead of emergencies
Providing and receiving disaster warning	Sharing warnings
	Getting situational awareness about hazards from communities
Maintaining community discourse on disasters and preparedness	Generate dialogue on hazards and preparedness
	Foster community conversations and connections
	Preserve collective memories and experiences
Being a communication resource for preparedness volunteers	Serve as platforms for volunteers to co-ordinate among themselves
	Serve as platform for volunteers to communicate with people
	Learning and support platform for volunteers and local people

Table 7.2 – Social media functions in the pre-disaster stage

7.4.3 Challenges and considerations in utilizing social media

Despite social media’s uses described above, concerns of it “being another mass communication platform” persist. Social media messages of emergency management agencies are often “a catch all and it's not necessarily a targeted approach” (W_EM4). Compared to official pages, community pages like ECP or the SCRT were more frequently identified by participants as platforms for receiving and sharing disaster and risk information in the pre-disaster stage.

While people acknowledged that social media is “huge these days with actually getting a message out there”, some were sceptical about the ability of social media in supporting community actions on disasters. A participant mentions,

“I really don't know how useful it would be... in terms of getting the community together to think about addressing a particular hazard... I would have some real questions around how effective social media was in that regard... no doubt that it's very effective in getting information out to a lot of people very quickly but is it helpful in kind of proactive group

⁴² Social learning refers to the process through which individuals acquire new knowledge, behaviours, or skills by observing and interacting with others. This learning occurs in a social context, where individuals learn from the experiences, actions, and feedback of others (Bandura, 1977).

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Englewood cliffs Prentice Hall.

formation to address collective hazards that haven't happened. I would question that quite majorly because I've never seen it used to that end." – C_V8

Another major concern remains around digital divide. Participants acknowledged that not everyone can access social media for whom alternate communication avenues will be required. For example, a volunteer comments,

"We do have a Facebook page... but some residents are not on there. They don't have computers... So they'll be captured by the mail drop." – S_V3

Social media use also varies depending across communities. In urban areas social media performed well while it was not effective in engaging with older population and lower socio economic communities where mail drops, newsletters and involving other community groups worked better. Thus "sometimes a social media push works really well... but other times it's actually just through other ... community groups." (S_EM1). This highlights the need for multiple communication channels, as iterated by a volunteer who comments that for them "it would be maybe a piece of paper in the letterbox or an e-mail... For other people, social media would be much better" and hence "the channels will have to vary" (W_V4).

Communication over social media can be substantially improved by involving local people and volunteers as communicators. Involving local volunteers in disseminating official information often enhances its clarity, as the volunteers leverage their understanding of the local context and knowledge to make the information more relevant and actionable. For example, one volunteer shares that when there is an extreme weather warning, "a lot of (hazard) information goes on there (the ECP page)" and along with that the volunteers share "simple things like make sure your drains are all unblocked.... you have grab bags available" to promptly remind the community of the actions to adopt (BoP_V3). The volunteers play an important role in ensuring that the information available in local social media page are reliable and not sensational or incorrect. For example, expressing their displeasure with the information shared by the emergency management agency, a volunteer says that "oh my gosh, did you see that civil defense put that stupid post that said there's a big earthquake... If a tsunami is coming, it will be here in an hour...who wrote that... it just invokes fear on people. You gotta be so careful about what you put out". They stress how they strive to be "very careful to make sure that the information I'm delivering is very factual and not scare mongering".

Participants highlighted that the community members often "don't want someone from Wellington (referring to agencies and experts who lack local understanding) to come in and tell them how to manage something... you need someone in your town that's going (through) that (experience)". The local volunteers are often respected members within the community like teachers, principals, religious leaders, fire brigade volunteers who deeply "care about them (community members)" and "try really hard to create that rapport with people". Instead of the conventional top-down communication model, here the conversation flows between peers as "this is a risk... how do we deal with it?" emphasizing "I'm not telling you what to do, but this is something I'm suggesting". Such volunteers are also more relied upon as they belong to the local area and play a key role in building relationships and trust among the community and emergency management agencies. Even in scenarios where official responders like emergency management agencies, council and non-governmental agencies are not trusted, the local volunteers function as credible information providers, by working closely with emergency management agencies and scientific organizations.

“I want people to immediately feel like I'm not the Council or the authorities... Sometimes I'll specifically say it comes from the response team, but I think people just know now that it's just me and that I'm clearly a part of that... I think that was really important for us, that people knew that we were who they could trust... there are people that don't trust the Council, people that don't trust the (names another agency)... like that they've been hurt before, so that feels important, that they know it's coming from us. We're here with them.”

- BoP_C_V1

Integrating posts on disaster preparedness with other information that the community is more interested in helps in getting more engagement. For example, an official with a non-governmental organization says that they can get up to “five thousand views” on Facebook posts that contain combined information of weekly crime reports and disaster and risk information (BoP_N1).

7.5 Discussion

The paper explores the function of social media in the pre-disaster stage, how it can support civic participation and collective actions and identifies key considerations for its use. The findings support Houston, Hawthorne, et al. (2015)'s functional framework and find social media use in providing and receiving disaster preparedness information and warning. Two additional functions include maintaining community discourse on preparedness and being a communication resource for volunteers. The data shows that social media supports pre-disaster civic participation and collective action mainly as a communication resource for volunteers. The main challenges of using social media include digital divide, differences in usage based on audience and concerns on its effectiveness in generating preparedness actions.

Facebook emerged as the most widely used platform. This is likely because of its existing user base, making it more useful than platforms like X or Instagram and emergency management specific tools (Reuter et al., 2017). Community Facebook pages are more effective in the pre-disaster stage, particularly to reach people who are not seeking disaster information actively. This might be because preparedness is often not of interest for people (Becker et al., 2012; Wukich, 2020), leading to lower engagement with official emergency management channels focused on disaster and risk communication. Additionally, involving different agencies and blending disaster messages with information that people seek, like neighbourhood crime reports, was beneficial in reaching more people. In general, this suggests that to enhance public engagement in emergency management, it is essential to incorporate additional benefits rather than relying solely on risk reduction outcomes.

Engaging local people and volunteers as communicators offer multiple benefits. Risk knowledge and beliefs among community members vary - emergency management agencies need to tailor communication to these diverse perspectives (Tampere et al., 2016). Volunteers' local knowledge and experiences enable them to contextualize technical messages and provide understandable actionable suggestions compared to generic social media posts (Eckert et al., 2018; Jha et al., 2016). Such co-production of risk knowledge recognizing local hazards and lived experiences has shown to improve preparedness communication outcomes (Lejano et al., 2021). Additionally, volunteers' local connections, and long-term presence make them the trusted communicators ahead of emergencies which is crucial for effective crisis communication (Lejano et al., 2018; Sharpe, 2021a).

Regarding support for civic participation and collective action, social media is used in the pre-disaster stage primarily for information and learning purposes than for organizing and mobilizing people (Jung & Kim, 2021; Segerberg & Bennett, 2011). It serves as a communication resource for volunteers who utilize it to reach the local community and establish presence. It also enables the volunteers to connect with each other, even when logistical constraints are present, share experiences, learn and improve through social learning - thus serving as a critical resource in developing virtual communities of volunteers (Dufty, 2012; Wenger, 1998; Wulf et al., 2013). The data also indicates that social media is used to improve connections within the community and with local authorities and encourage community conversations on disasters. While the data do not provide direct evidence, other studies have identified that sustained interactions even on virtual platforms can foster collective awareness (Farinosi & Treré, 2014) a sense of identity (Alexander, 2014), sense of community (Paton & Irons, 2016) and improve social capital⁴³(Kaigo, 2012; Page-Tan, 2021) all of which contribute to collective actions (Rees & Bamberg, 2014; Van Zomeren, 2013) and disaster resilience (Kwok, 2018).

As widely documented, digital divide remains a major concern with disparities in social media use of different groups, like the elderly, people with low language proficiency, socio-economic groups, accessibility issues (Anikeeva et al., 2016). While increasing accessibility of social media by providing language translation services, increasing digital literacy, reducing internet connectivity costs etc. can be effective (Navarro de Corcuera et al., 2021), even with access, some groups, like the elderly might prefer traditional sources of risk communication (Feldman et al., 2016). So, it is important to ensure that official decisions are not overly influenced by social media conversations and that the needs of those who are not represented on these platforms are not overlooked (Paul & Sosale, 2020). Aligning with prior research, we argue that a multichannel strategy should continue with social media complementing rather than substituting traditional media (Kuttschreuter et al., 2014; Lovari, 2020; Merchant et al., 2011). With multiple platforms, the challenge is to curate content for different platforms and audiences. Use of new technologies like generative AI can be explored for this purpose (Nova, 2023).

It is noteworthy that effectively using social media requires dedicated personnel, proper training and institutional support. The success of Selwyn's virtual group highlights the benefits of having an official involved who can maintain the community spirit by prompting conversations and responding to comments, encouraging reciprocity, building interest of the community in the topic (Hafeez et al., 2019) and maintaining a sense of inclusion in the virtual environment (Paton & Irons, 2016). If social media is to be effective in official disaster communication, a structured, strategic approach with clear guidelines outlining privacy, and security concerns and stakeholder commitment to providing the necessary support is needed.

Credibility concerns were not mentioned which might be because misinformation/disinformation are not major problems when there is no imminent threat (Dufty, 2012). Alternatively, factors such as the type of social media group (open or closed), member vetting processes (public access or police-approved), and the level of moderation contributed to addressing the issue. For example, the Selwyn

⁴³ Social capital refers to the networks, relationships, and norms shared among individuals and groups that facilitate cooperation and collective action among them. Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American Behavioral Scientist*, 59(2), 254-269.

group, is a closed, police-vetted group moderated by a facilitator. The Edgumbe page, though open, is used by the small local community with the true identities of users generally known. It also has active moderators and local volunteers. Factors like having closed groups, moderators and/or the involvement of local people may have contributed to addressing credibility issues (De Albuquerque et al., 2015; Reuter et al., 2015; St Denis et al., 2012; Yan & Pedraza-Martinez, 2019), even in the open group (Anikeeva et al., 2016). Issues around over-reliance on social media for time critical information like warning information was not observed in the data probably because multiple communication channels are used.

Practice recommendations include: i) engaging in virtual groups of geographic, ethnic, or interest communities in addition to generic social media outreach, ii) involving local people and organizations as communicators and leveraging community interests, iii) maintaining a multichannel communication strategy, and iv) setting clear guidelines and resourcing mechanisms for social media use in pre-disaster communication. We expect the findings will help in systematizing social media use and developing standardized frameworks for pre-disaster communication.

While we find Facebook as most used, demographic variations in social media use exist. For example, platforms like Instagram may be useful to target younger audience (Cardinal et al., 2021) or Viber for former refugees (Marlowe et al., 2022). Understanding these variations across demographic groups even in the same neighbourhoods is necessary to improve disaster communication. Additionally, we aimed to explore how (if) counter-narratives emerge on social media and their potential to influence public opinion against officially recommended information and actions. While our dataset did not reveal any such data, it remains a critical avenue for future research. Studies applying quantitative techniques to map preparedness communication networks on social media and comparing engagement with different message formats and channels would also be beneficial.

7.6 Conclusion

The paper identifies the functions of social media in the pre-disaster stage. It posits that social media can help in providing and receiving preparedness information and warning, maintaining preparedness in regular discourse and supporting volunteers. The findings highlight the potential of social media in encouraging civic participation and collective action in the pre-disaster stage and provides guidance on optimizing the use of social media. We expect the findings would be of use for both scholars and practitioners, not only in disasters, but also in environmental and ecological communication, and climate action communication.

Chapter guide

Chapter 2 Literature review	The chapter presents an overview of communication literature on civic participation and collective action for reducing disaster risks.		What are we studying?
Chapter 3 Research Methodology	The chapter discusses the research philosophy and research methods adopted in this study		How are we studying it?
Chapter 4 Civic participation & collective action	The chapter outlines the characteristics, outcomes, facilitators, barriers and individual motivators towards civic participation and collective action in disaster preparedness in New Zealand.	Setting the context	What are we studying considering the context?
Chapter 5 Existing communication practices	This chapter describes the communication practices employed in New Zealand to promote collective action in disaster preparedness.	Exploring communication practices and its influences in the context	What do we find?
Chapter 6 Communication content	The use of narratives to encourage collective action in disaster preparedness is explored in this chapter.		
Chapter 7 Emerging areas of communication	This chapter examines the use of new media in fostering civic participation and collective actions in disaster preparedness.		
Chapter 8 Discussion and Conclusion	The chapter presents guidelines on how existing communication practices can be improved.	Recommendations for practice	What do we recommend?

Chapter 8 Discussion and conclusion

The concluding chapter of this thesis synthesizes the findings and discussions from the preceding chapters to address the overarching research question: How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same? It begins by providing an overview of the research and reflects on the process of conducting this research. The chapter then discusses the key findings and their implications on academia, policy, and practice. Lastly, the limitations and areas of further research are highlighted.

8.1 Research overview

The limitations of the disaster response centric command-and-control approaches in adequately addressing the needs of people after major disasters through the 1950s to 1980s, such as the 1980 Mt. St. Helens eruption, the 1979 Three Mile Island accident, and others, sparked a criticism of its suitability in reducing disaster impacts (Dynes, 2002; Quarantelli, 1990). This critique gained momentum over the next decades when a range of sociological research on disasters demonstrated that community participation is essential for effective disaster risk reduction (DRR) and a shift towards community-centred approaches was advocated not only as a commitment to deliberative democracy, but also because it tends to be more effective in delivering locally appropriate sustainable solutions (Delica-Willison & Gaillard, 2012; Dynes, 1993; Quarantelli, 1984; Shaw, 2012; Stallings & Quarantelli, 1985).

These influential findings impacted international policy and strategic frameworks on DRR. The 1990s were declared as the International Decade for Natural Disaster Reduction (IDNDR) and the Yokohama Strategy and Plan of Action for a Safer World was adopted in 1994 (United Nations, 1994; United Nations, 1999). The strategy placed a strong emphasis on active participation of community members in disaster risk reduction (DRR). The subsequent agreements of the Hyogo Framework for Action (2005 - 2015) and the current Sendai Framework for DRR (2015 - 2030), further reinforced the importance of community participation in disaster risk reduction efforts (UNDRR, 2015; UNISDR, 2005).

The current policy landscape in New Zealand aligns with this global outlook, emphasising the need for community participation in DRR. While early legislations like the 2002 Civil Defence Emergency Management Act of New Zealand, encouraged people's involvement by highlighting individual and community responsibility in reducing their risks, later strategies recognized that individual actions alone are not enough to address larger challenges that require broader societal and systemic changes (Ministry of Civil Defence and Emergency Management, 2002). Acknowledging this, the National Disaster Resilience Strategy 2019 of New Zealand prioritizes collaborations, partnerships, and collective actions between different stakeholders across various sectors for reducing disaster impacts (Ministry of Civil Defence & Emergency Management, 2019). This involves fostering strong connections between government agencies, non-governmental organizations, communities, and individuals to collectively prepare for, respond to, and recover from disasters.

In this context, the crucial questions are: How do we communicate about collective action for DRR to people? and, How do we support people's participation? Considering the collaborative nature of collective actions, effective communication among communities and stakeholders is crucial for sharing actionable information, mobilizing resources, and coordinating efforts for addressing disaster risks collectively (Ireland & Thomalla, 2011; Damtew et al., 2021; Garvey & Paavola, 2022). Previous

research suggests that fostering trust among stakeholders, communicating the aims of civic participation, facilitating knowledge exchange and community connections, and various other factors influence people's participation in collective preparedness actions (Eiser et al., 2012; Yuanjaya & Fajri, 2020; Greenaway & Witten, 2006; McGee & Langer, 2019). However, there remains a lack of systematic understanding regarding the impact of communication approaches on people's participation in collective preparedness, as well as effective strategies to motivate participation (Ryan et al., 2020; Uscher-Pines et al., 2013). This gap is surprising considering that communication plays a fundamental role in disaster preparedness initiatives (Abunyewah et al., 2020), shaping risk perceptions and behavioural responses (Reynolds & Seeger, 2005). While research has extensively explored communication for individual and family preparedness, clarity on its role in fostering collective actions remains limited (Bradley et al., 2016; Glik, 2007). Acknowledging this, Burnside-Lawry et al. (2013) emphasize the need to identify key communication strategies to facilitate constructive collective action among all stakeholders involved in disaster risk reduction. In this context, my research endeavoured to explore the following question:

“How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?”

I answered this primary question by taking up the following sub-questions:

RQ1: What is civic participation and collective action in disaster preparedness in New Zealand?

RQ2: What communication practices are used to encourage civic participation and collective actions in disaster preparedness?

RQ3: What are the effective approaches and considerations when encouraging civic participation and collective actions in disaster preparedness using communication?

An exploratory sequential mixed methods design was adopted, incorporating a qualitative multi case study and a quantitative questionnaire survey (refer Chapter 3). This design was selected as it aligns with the pragmatic paradigm of the researcher, enables an examination of the research problem from objectivist and interpretivist perspectives and theoretical viewpoints, and is suitable for interdisciplinary research (Creswell, 2014).

Four community groups working on disaster preparedness were selected as cases, one each from Bay of Plenty, Wellington, Canterbury, and Southland in New Zealand. Thirty-five semi structured interviews of 1 to 1.5 hours were conducted between February 2022 and September 2023 with emergency managers, leaders and members of the community groups. Additionally, field visits and non-participant observations were conducted and relevant documents were collected. Thematic analysis and cross-case analysis were conducted to derive the qualitative findings. For the survey, a 36-item self-administered questionnaire comprising of both multiple choice and free text questions was distributed among community members participating in collective preparedness between September 2023 and November 2023. Eighty responses were received on which descriptive statistical analysis was conducted (refer Chapter 3).



Figure 8.1 – Map of study locations

An integrated discussion on the findings from the study is presented next. First, the results from the research questions are presented along with their theoretical and practical implications. Then, the contributions, limitations and future directions are discussed, before ending with the concluding remarks.

8.2 Integrating the findings: Insights, interpretations, implications and future directions

The table below presents the research questions and key findings corresponding to each.

Table 8.1 – Research questions and key findings

Overarching research question: <i>“How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?”</i>		
Research objectives	Key insights	Chapter References
RQ1. <i>What is civic participation and collective action for disaster preparedness in New Zealand?</i>		<i>Ch. 2 & 4</i>
i. To explore what civic participation and collective action are in the pre-disaster stage	<ul style="list-style-type: none"> • Collective action in DRR is understood in different ways, ranging from collaborative development of response plans, volunteering in response teams, environmental collective action for hazard mitigation, to protests & rallies demanding government action. • Collective action can be defined as joint activities by groups of people to improve community wellbeing by reducing disaster risks. • People participate (civic participation) to support such collective actions by leading and/or volunteering in the initiatives. 	2.2, 4.2.1
ii. To understand the nature and forms of civic participation and collective action in the pre-disaster stage	<ul style="list-style-type: none"> • Risk reduction actions can be in the political or public sphere and institutionally accepted or conflictual in nature. • Collective actions in NZ are concentrated in the public sphere for institutionally accepted actions. • Collective action is observed in three forms – nationally certified community teams of response volunteers (NZ-RTs), informal community groups undertaking emergency management actions at the local level (community response teams), and broader community groups working on a range of developmental issues. • The three forms are suitable to integrate a broad range of stakeholders and spontaneous volunteers. It supports resilience building. However, in practice, there is poor integration of different governmental sectors and population segments to attain common risk reduction goals. • There are concerns that instead of being an enabling mechanism, the idea of collective action might get exploited to transfer risk reduction responsibility to communities. 	2.2, 4.2.1, 4.2.2, 4.5.1, 4.6
iii. To document the activities	<ul style="list-style-type: none"> • Goals include knowledge and awareness generation and implementation of risk reduction actions. • Implementation of risk reduction actions is less studied in NZ, so this research focuses on it. 	2.2, 4.2.4, 4.5.3, 4.6

<p>happening through collective actions at the community level, and its outcomes</p>	<ul style="list-style-type: none"> • Risk reduction actions include undertaking prescriptive tasks like developing response plans, advocacy, improving connections, and enhancing situational awareness. • Collective community actions contribute to intangible community assets like sense of community and social capital. • Presence of community groups with strong networks does not necessarily imply that under-represented people are benefiting from the collective community actions. This contradicts some research on social capital and argues that the presence of strong networks does not necessarily improve linking and bridging capital, highlighting a limitation of social capital-based approaches. • Currently, the focus of collective actions is on improving response to extreme events. There is limited evidence of actions happening to stop risk creation, e.g. by working in hazard mitigation, and improved risk governance etc. 	
<p>iv. To identify how civic participation and collective action in the pre-disaster stage emerge</p>	<ul style="list-style-type: none"> • Two main factors - Hazard awareness, through hazard experience or because of public discourse on hazards, and facilitation by emergency management agencies. • High hazard awareness is not essential or sufficient to prompt collective action. 	<p>4.2.3, 4.4, 4.5.2, 4.6</p>
<p>v. To assess what factors influence people to participate and volunteer in collective action in disaster preparedness</p>	<ul style="list-style-type: none"> • The facilitating factors are identified as: trusted facilitators/communicators with local knowledge, social environment that promotes community conversations on hazards, and social learning from other community groups working on DRR, maintaining honesty, trust and respect in the process, supporting community ideas and solutions and providing institutional support. • Constraining factors are found to be lack of interest, bureaucracy, and conflicting governmental priorities. • This offers new insights on community led processes, highlighting that in certain situations, communities require agencies to support or even lead them. Even existing groups can disintegrate without such institutional support – they need to move beyond “community led” to “community enabling”. 	<p>4.2.3, 4.5.2, 4.6</p>
<p>RQ2. What communication practices are used to encourage civic participation and collective actions in disaster risk reduction?</p>		<p>Ch 2, 5, 6, 7</p>

<p>i. To understand how communication encourages civic participation and collective action in disaster preparedness</p>	<ul style="list-style-type: none"> • The findings provide an overview of the different disciplinary fields guiding communication and participation in DRR. A research gap in relational approaches to disaster and risk communication is identified, and the research contributes to advancing literature in this area. • The research applies communication infrastructure theory (CIT) to map the communication network, actors and resources that promote participation and collective actions in DRR at the community level in the pre-disaster stage. • The findings identify four main actors in the communication network - emergency management agencies, emergency services and govt depts., CBO/NGOs and local people. Aligning with previous research I find limited presence of mass media. However, the findings show limited presence of geo-ethnic media⁴⁴, which contradicts prior research. • The study identifies the different ways through which people learn about collective actions - interpersonal influence (shoulder tapped/invited by someone I know), community conversations (discussions happening in the community, word of mouth etc.), newspaper/newsletter, personal conversation (with friends, partner, neighbour), public events (meetings, information sessions), social media (community Facebook page), internet search (e.g. Google), mass media or a mix of multiple channels. • The results outline the contextual influences that promote or hinder effective communication. • The findings also document some of the concerns including issues of communication inequities, lack of resources, etc. • The relational network perspective adopted in this study helps in gaining a comprehensive understanding of the communication processes as well as supports communication research on resilience. 	<p>2.3, 5.2, 5.4, 5.5</p>
<p>ii. To identify what is communicated?</p>	<ul style="list-style-type: none"> • Compared to communication to promote individual actions, most communication to encourage collective actions happen during community engagement processes, like workshops, meetings and relationship building activities. Mass communication is rarely used. Here information and messages are passed through conversations following a narrative format. 	<p>6.2, 6.4, 6.5</p>

⁴⁴ Media outlets that serve specific geographic and ethnic communities, providing content that is relevant to both the location and the cultural background of the audience.

	<ul style="list-style-type: none"> • Conversational narratives are examined, and four themes are found to be prominent in the narratives – simple everyday actions, collective efficacy, collective responsibility, and care for community. • The findings outline how mass media narratives are inadequate to prompt collective actions. • The study identifies how existing narratives support or constrain civic participation and collective actions and proposes strategies for addressing the challenges. 	
iii. To identify the emerging practices	<ul style="list-style-type: none"> • Social media, particularly neighbourhood Facebook pages, were identified as an emerging platform of communication. • Current literature identifies four roles of social media in the pre-disaster stage – i) provide and receive disaster preparedness information, ii) provide and receive disaster warnings, iii) signal and detect disasters, and iv) implement traditional crisis communication. The findings identify two more roles, i) maintain preparedness conversations in regular discourse, and ii) support community of practice in preparedness. • Although new and innovative communication techniques, such as games, virtual reality simulations, and citizen science applications, are being experimented with, the study did not find their adoption in the routine practices yet. 	7.2, 7.4, 7.5
RQ3. What are the effective approaches and considerations when encouraging civic participation and collective actions in disaster preparedness using communication?		Ch 2, 5, 6, 7
i. To identify emergency management officials', stakeholders' and community members' perspectives on effective approaches to communicate about civic	<ul style="list-style-type: none"> • Emergency management agencies are the most prominent communicating actors. Most new volunteers are recruited by them. • The findings highlight the importance of interpersonal influence and community conversations on disasters to interest people, as people often do not actively seek disaster information. • Social infrastructure that creates opportunities for local people to converse acts as an important resource in the network. • As interest in disasters itself remains low, attracting people to disaster specific events or actions is challenging. Aligning with previous research, the findings show that capitalizing on existing networks and relationships is beneficial. e.g. partnering with community leaders and organizations to spread disaster information and seek volunteers, maintaining presence in community activities organized for different purposes to promote pre-disaster collective actions. 	5.4, 5.5, 6.4, 6.5

<p>participation and collective action</p>	<ul style="list-style-type: none"> • The findings show that people’s participation in DRR collective actions increase when there are value additions, like ability to spend time with friends, having a comfortable and safe environment to work in etc. • Sharing messages in narrative formats helps to contextualise it, improves its understandability and promotes community actions. • Suitable narratives are beneficial to promote citizen agency, community connections and care and efficacy beliefs, all of which influence collective actions. • The study integrates perspectives of emergency management agencies and communities to propose approaches to improve existing communication practices. 	
<p>ii. To identify main considerations when using communication to encourage civic participation and collective action</p>	<ul style="list-style-type: none"> • Major issues when using relational communication approaches are inequitable access to communication networks and constraints in knowledge, skills, time, and/or resources. These issues persist in physical and virtual channels. • The findings outline issues when narratives do not reflect people’s local knowledge and lived experiences. • The study identifies that statements highlighting expected actions or setting norms might cause frustration, loss of support and may even be disempowering. • The results also highlight issues of power imbalances in the communication network that hinder open and respectful dialogue. • The findings suggest that communication can be exploited by agencies to transfer risk reduction responsibility to citizens and highlights some ethical considerations. 	<p>5.4, 5.5, 6.4, 6.5, 7.4.3, 7.5</p>

8.2.1 Civic participation and collective action for disaster risk reduction in New Zealand

The first part of the research explored what civic participation and collective action for disaster risk reduction (DRR) means.

8.2.1.1 *Literature base*

The literature review showed that people participate in two broad areas in DRR – 1) generation of knowledge and awareness, and 2) implementation of risk reduction activities – to collectively reduce risks facing their community. In New Zealand, substantial literature exists on the first area. So, the research focused on the second area – implementation of risk reduction actions.

Forms of participation in implementation of risk reduction actions can be differentiated based on two parameters: i) whether participation is in the policy and political realm or in the public sphere, and ii) whether the actions are aligned with institutional arrangements and accepted norms, or are conflictual (Evers & von Essen, 2019). In the political realm, people's participation is in governance, policy formulation, or activities that decide how DRR should operate. For example, people's participation in co-administration of natural resources where special interest groups (such as forest user groups, catchment groups) determine resource management strategies, governing policies and implementation of protective actions. As these forms of participation are integrated in the governance systems, they align more with institutional expectations and norms. The contested variation of participation in the political realm involves consultations and advocacy on policies, resource governance, citizen's rights, and risk reduction plans, with interest groups and community members. Here, participation is in the form of communicative actions ranging from deliberation, debates, and lobbying. Conflicts and contestations against the institutionally promoted agenda is common, often due to differing perspectives and interests.

Participation in the public sphere in institutionally accepted forms include volunteering, being part of community-based disaster management groups (variously known as community emergency response teams, village disaster management teams, etc.), and providing support to activities undertaken by emergency management agencies. These groups operate within institutionally accepted areas of participation and are the most common. Contested forms of participation in the public sphere, though less documented, involve rallies and protests to demand improved preparedness and mitigation measures of hazard risks.

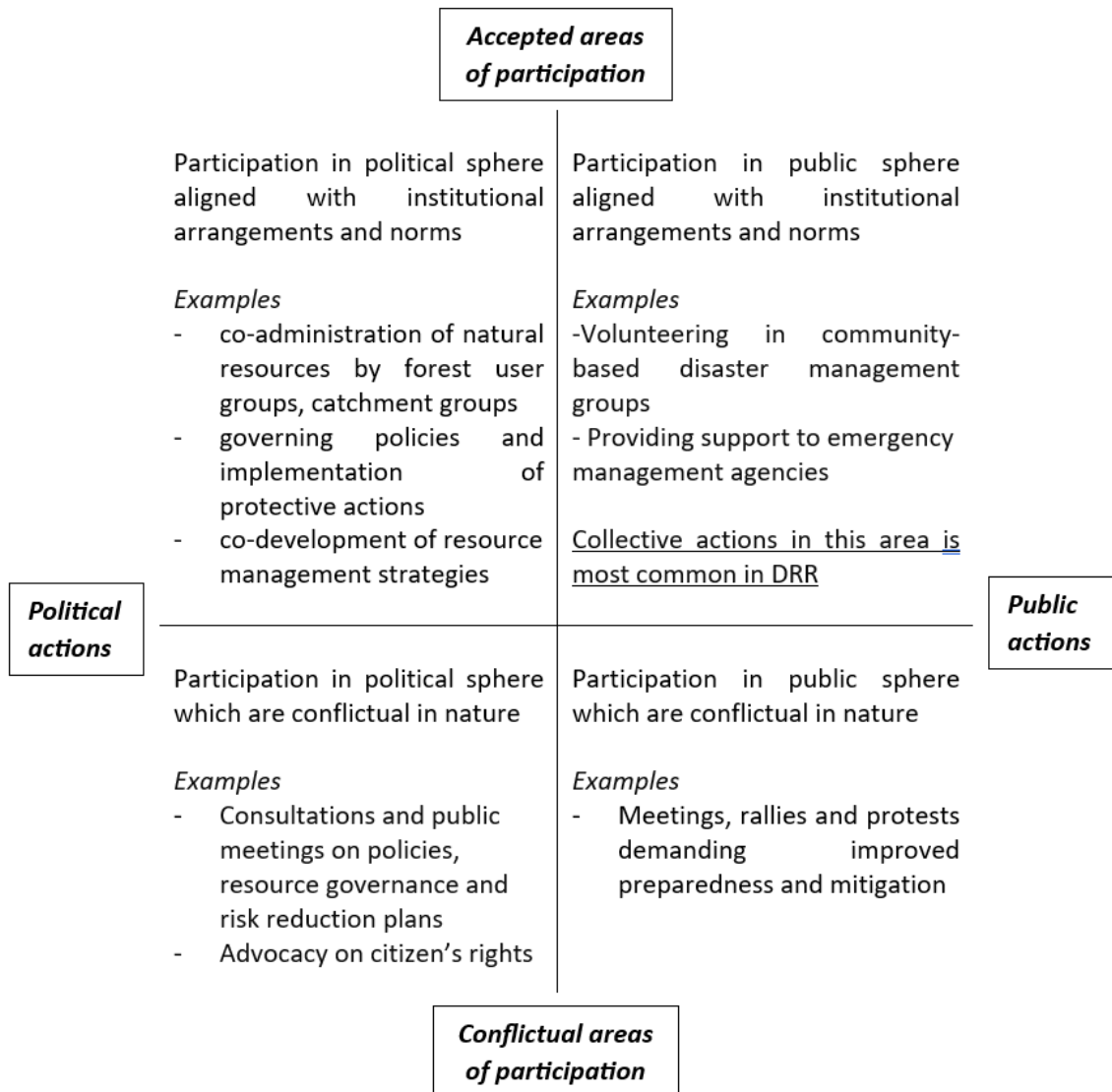


Figure 8.2 – Areas of civic participation for implementing disaster risk reduction actions

8.2.1.2 Civic participation and collective action in DRR in NZ

Based on this understanding, the areas of civic participation and collective action in DRR in NZ were explored and the outcomes of such collective actions and their facilitators were identified.

Nature and forms of civic participation and collective action in DRR in NZ

Aligning with the global pattern, community action in DRR in NZ is limited to the institutionally accepted public arena. In this, people participate in emergency management activities in three ways:

- i) volunteering with New Zealand Response Teams (NZRTs) which are the volunteer groups certified to undertake specialized response activities like light rescue, cordon and traffic management, welfare functions, etc.,

- ii) being part of community emergency response teams which are volunteer groups formed of local community members who actively organize risk reduction activities within their communities (however typically they are not formalized entities), and
- iii) being part of broader community groups, associations and organizations (like resident's association, sports clubs etc.) within a community that support and maintain a working relationship with emergency management agencies, however they are not solely focused on emergency management functions.

The approaches currently adopted create avenues for broader community groups (not those working solely on emergency management), to participate, and are suited towards spontaneous volunteers post disasters, thus contributing towards building resilience. However, other forms of collective actions, such as local organizations collaborating with disaster management agencies to mitigate local hazards, tackling environmental factors causing risks, or conflictual activities in the form of demonstrations or protests, were largely missing in the DRR space. Thus, the findings highlight that the approaches currently adopted are largely centred around preparedness for response, with limited focus on prevention and mitigation of factors that cause risks.

Outcomes of civic participation and collective action in DRR in NZ

The groups contribute toward risk reduction by engaging in prescriptive preparedness activities (like developing community emergency response plans, identifying evacuation centres, maintaining response equipment etc.), adopting advocacy roles, promoting connections and communication within the community and with official agencies, and enhancing situational awareness. They also play a crucial role in strengthening intangible assets like sense of community and social capital.

Factors influencing civic participation and collective action in DRR in NZ

Two main factors that prompt civic participation include: i) heightened hazard awareness, and ii) facilitation by emergency management agencies. Interestingly, the findings show that high hazard awareness does not necessarily lead to communities undertaking collective actions. While communities self-organizing and leading initiatives are desirable, there are situations where institutional assistance and agency led approaches are essential to support DRR activities, until collective actions emerge (if at all). Even in areas where community groups are already established, they may deteriorate or disband if institutional support is not provided when required.

Other factors that positively influence the emergence and sustenance of collective action include having trusted facilitators who have rich local knowledge, community conversations on hazards, social learning from other groups in the area, maintaining honesty and trust in the process, respecting and supporting community ideas and solutions, and providing institutional support as needed. The constraining or challenging factors include lack of community interest in DRR, bureaucracy, and conflicting priorities of governmental agencies.

Figure 8.3 below provides a graphical overview of the findings on civic participation and collective action in DRR.

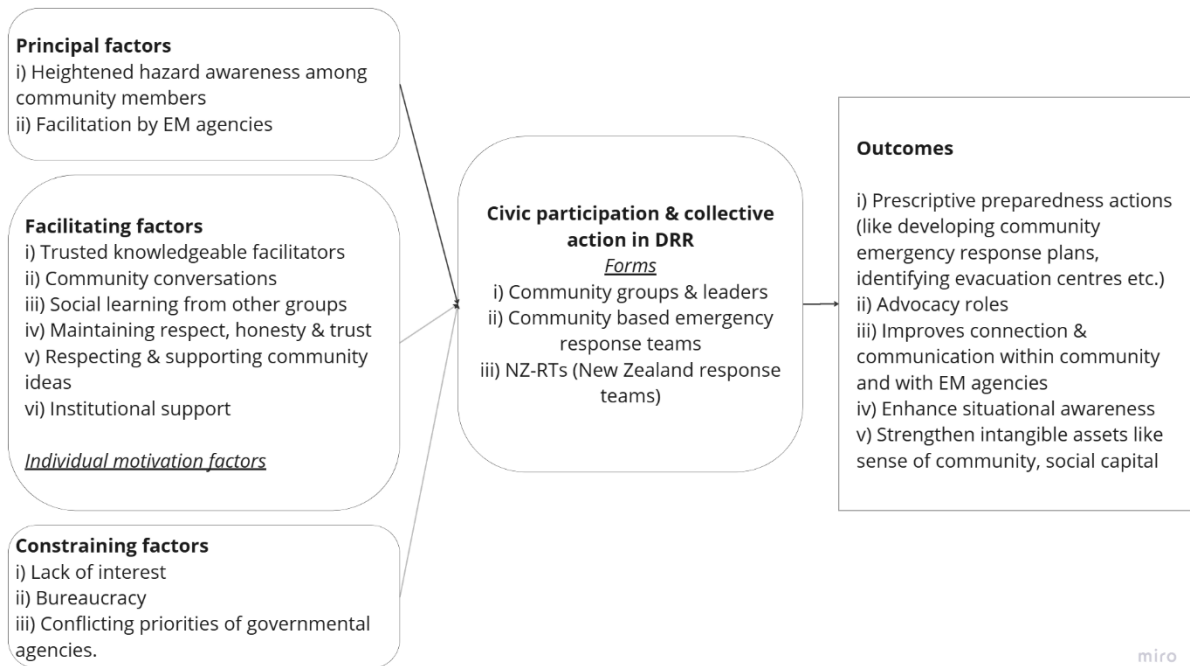


Figure 8.3 – Graphical overview of civic participation and collective action in DRR, including the influencing factors, its forms and the outcomes.

Principal factor - Main factor or driver behind civic participation and collective action; *Facilitating factor* – Supporting factor that enables the occurrence and sustenance of civic participation and collective action; *Constraining factor* – Factor that hinders or limits the occurrence of civic participation and collective action

8.2.1.3 Practical implications

Based on the findings, I recommend the following considerations for improving the current practice, particularly for emergency management agencies:

1. Community led and institutionally supported

Though community led initiatives are preferred, in certain situations communities require agencies to support or even lead them. Without such support, these initiatives may decline or disintegrate. Therefore, instead of expecting communities to take responsibility and lead initiatives (community-led), emergency management agencies should adopt a context-informed approach, deciding on the appropriate level of support through conversations with the community members and extending the support, to enable communities to take actions (community-enabling). While there may be concerns that such an approach will lead to issues seen in agency-led top-down approaches, I argue that it can be avoided as long as agencies exercise a conscious restraint - taking a leading role only when community members seek so and transferring leadership back to community when community members are able to assume that role.

2. Collaboration and relationships

Maintaining collaborative working relationships with communities built on honesty, trust, and mutual support is essential. Therefore, it is crucial to assign skilled facilitators with rich local knowledge who are trusted in the community to support collective initiatives in DRR. Equally important is identifying strategies to ensure continuity in the relationships if (when) existing facilitators leave, or when the facilitator positions have a high turn-over rate. This need is especially critical when working with hard-to-reach communities, where sustaining relationships is vital for building trust.

Targeted programmes to support civic participation by diverse groups is valuable. However, it is essential to outline a strategy for integration as well, i.e., how these groups will collaborate and work together both before and after an emergency to reduce disaster risks. For example, the study finds limited evidence on how connections between marae, iwi, and Māori organisations, associations for culturally and linguistically diverse groups (CALD), and volunteer teams (like community emergency response teams), are established before events to ensure effective collaboration and collective action, particularly post event. While informal understanding and collaborations exists in some of the study areas, clearer formal mechanisms are essential to improve the effectiveness and outcomes of existing approaches.

3. Inclusive equitable actions

All community actions are not equal - some will benefit the whole community while some will benefit a select few. It will influence people's interest, involvement, support and opposition to different DRR actions. To foster community based collective actions, it is important that officials listen to community concerns, recognize these differences and develop policies and practices that are sensitive to these differences.

It is important to note that geographic communities are not singular cohesive units. There are diverse, sometimes conflicting interests even within the same community. A challenge is to maintain a balance between enabling community groups to lead initiatives while ensuring oversight over the collective actions undertaken by community groups. This is important to ensure the collective efforts acknowledge diverse voices, are equitable, and are not taken over by the elite or are oppressive to the marginalized.

There is a need for attention towards the broader issue of accountability and ethical obligation when promoting civic participation. Civic participation and collective actions should not be exploited to transfer responsibility and shift burden of risk management to communities. Oversight on this matter is essential and national agencies, like the National Emergency Management Agency (NEMA) and/or the Department of Prime Minister and Cabinet could step up and implement mechanisms to ensure accountability.

4. Holistic approach to DRR governance

Expand the aim of pre-disaster risk reduction actions at the community level beyond preparedness to encompass broader areas, including natural hazard risk mitigation, adaptation, environmental protection, socio-economic development, and others. This approach addresses the broader objective

of preventing risk creation through appropriate preventive and mitigative actions. It is crucial that officials recognize the linkages of DRR with natural resource management, climate change and developmental activities happening in the community, acknowledge the dependencies, and synergize the actions to ensure departmental priorities align and support actions that minimize risk creation.

Instigate supportive legislative changes to adopt this holistic approach and encourage the necessary inter-organizational collaboration. Additionally, allocation of responsibilities and resources to emergency management agencies and relevant stakeholders to undertake such integration is required. Lastly, it is vital that the bottlenecks and inefficiencies caused by bureaucratic processes are identified and assessed through consultations with diverse stakeholders to establish a clear course of action to address the issue as required.

8.2.1.4 Theoretical implications

A persistent challenge in participation literature in the disaster space is that the term participation currently encompasses a broad range of actions and outcomes ranging from merely consultation on preparedness projects to citizen-led governance of preparedness projects. Multiple factors have contributed to this ambiguity - particularly disciplinary differences in defining participation, and funding requirements that mandate participation leading to the term's widespread use. In the absence of standardized consistent usage of the term participation, advancing the understanding of participation becomes difficult. Additionally, designing usable and meaningful frameworks and indicators for evaluating participatory processes, their quality and impacts become challenging. For example, evaluating a governance form of project using parameters suited to a consultation type of project is not meaningful. Therefore, establishing uniform terms relating to people's participation in DRR and promoting their consistent usage is crucial.

This study contributes to that effort by outlining different forms of participation in DRR and examines one specific form – participation in implementing risk reduction actions in the public sphere through institutionally accepted forms - to advance our understanding (refer 2.2, 4.2.1, 4.2.2, 4.5.1, 4.6).

8.2.2 Communication for encouraging civic participation and collective action

The second part of the research examined communication practices used to support and promote civic participation and collective action.

8.2.2.1 Literature base

The literature on communication and participation in the disaster field draws from four broad theoretical traditions:

i) **the cognitive-behavioural-social-psychological tradition** of influencing preparedness factors – which analyses the decision-making and psychological processes that drive individuals to adopt disaster preparedness actions, and tailors communication to influence these factors, thereby promoting preparedness behaviours.

ii) **the relational communication approaches** looking at networks, relationships and ecology of communication. These draw on the perspective that people are embedded in communication networks connected to multiple communicating actors, like friends, neighbours, community organizations, local media, emergency management organizations etc. It aims to leverage these communication networks, particularly the informal connections among people, to disseminate disaster and risk information, foster community belonging and promote civic participation and collective actions.

iii) **the approach of indigenizing initiatives**, which are based on the understanding that people's actions to reduce risks are influenced by their lived experiences, social interactions and cultural contexts (Douglas & Wildavsky, 1983; Kahan & Slovic, 2005), which may not align with objective scientific perspectives (Tansey & Rayner, 2020). So, this approach aims to design communication in a way that bridges the gaps between the scientific view and the community view, collaboratively developing solutions (co-create, co-design) that respect local and indigenous knowledge to ensure the solutions are suitable for and supported by the local people; and

iv) **the critical studies lens of addressing power differentials**, which is grounded in the idea that social, economic, and political structures that contribute to marginalization need to be addressed to substantially reduce disaster risks (Wallerstein & Duran, 2006). So, the aim here is to stimulate change, raise awareness, organize and mobilize people through communicative actions to attain emancipatory outcomes.

The initial review of literature revealed that communication practices to encourage community participation in disaster risk reduction actions are primarily following the first two approaches in New Zealand. The first one, cognitive-psychological tradition, has an extensive research base in New Zealand. However, the second strand is still evolving and hence the study focused on that, on relational communication approaches in DRR.

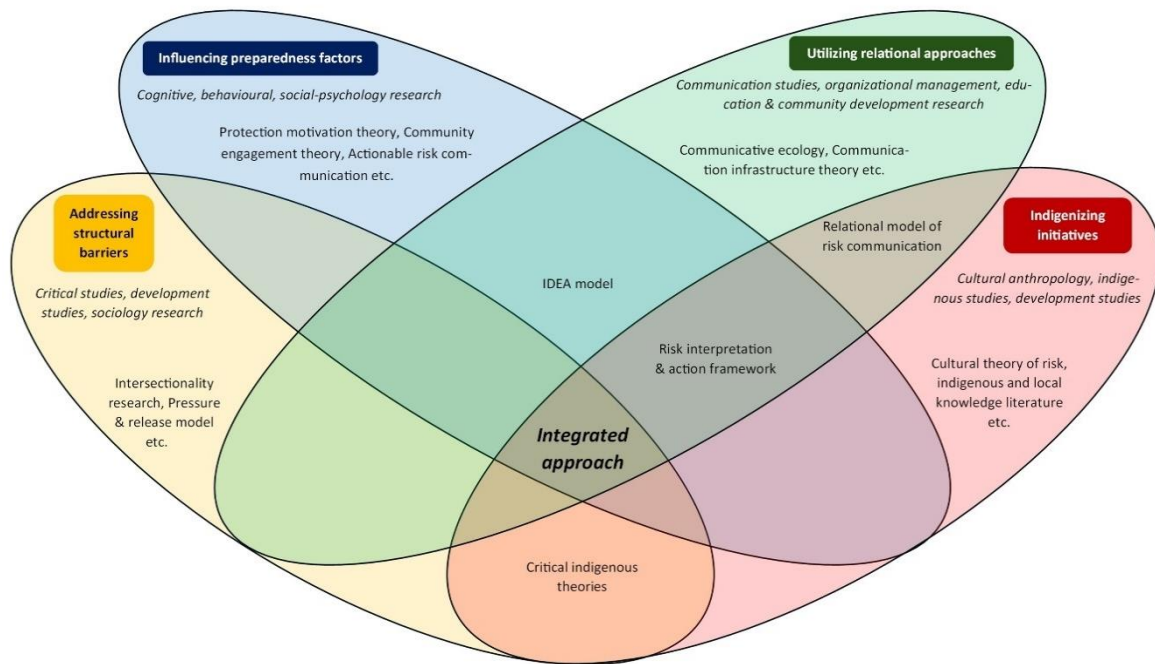


Figure 8.4 – Diagram showing the four traditions in disaster and risk communication research (taken from the literature review chapter).

Communication practices integrating principles from all four areas are recommended for an integrated approach for disaster and risk communication.

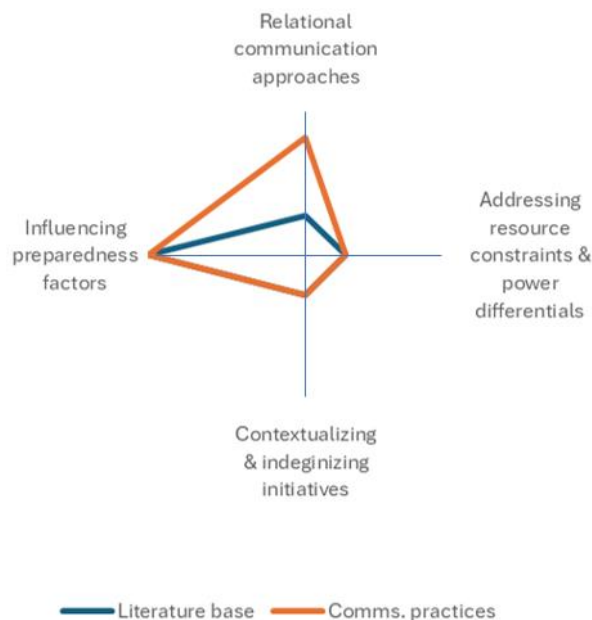


Figure 8.5 – Schematic interpretation comparing current communication practices & existing literature base on disaster and risk communication in New Zealand.

Both literature and practice on influencing preparedness factors is well developed. Communication practices adopting relational communication approaches are increasing, however supporting literature base is lacking. This gap is addressed in this thesis.

8.2.2.2 Communication to encourage civic participation and collective action – A relational network perspective

Our findings delve into three aspects of relational communication – i) the communication network, resources and context, ii) the narratives shared in these networks, and iii) one of the emerging avenues in relational communication, social media. I largely drew from communication infrastructure theory (CIT) to guide this study because it provides a comprehensive framework to study communication within a community, exploring the network, resources, contexts and narratives, and their influences on civic participation and collective action.

Communication network promoting DRR

Exploring the communication network, four main actors are found communicating about civic participation and collective action in DRR in the pre-disaster stage: i) civil defence emergency management (CDEM) agencies, ii) emergency service agencies and other government organizations or entities supported by the government, iii) non-governmental or community-based agencies, and iv) local people.

Civil defence emergency management agencies utilize advertising and promotional activities, interactive events for raising awareness and scoping, and relationship building activities to generate interest and engage communities. Emergency service agencies, government agencies, and non-governmental and civil society organizations support these activities by promoting them in their networks, connecting interested people with emergency management officials, and providing necessary assistance. Local people disseminate information and knowledge about collective preparedness gained from the above communication streams through conversations with family, friends, neighbours, and the broader community. As a group of residents interested in collective preparedness forms, they become advocates of collective preparedness within their communities, encouraging others to get involved and connect with the other communicating actors.

The quantitative data largely supports the qualitative findings, showing emergency management agencies are the main actors communicating about civic participation and collective action in DRR at the community level. It also highlights that inter-personal influence (e.g. shoulder tapping, inviting someone they know) and community conversations (e.g. discussions happening in community, word of mouth, etc.) are most effective in encouraging people to volunteer. Aligning with Communication Infrastructure Theory the study finds social infrastructure, such as community centres, meeting halls, schools, and public libraries, are critical resources in the network (Kim & Ball-Rokeach, 2006b). These places serve as gathering spots for community members, not only to participate in emergency management events but also to engage in community conversations, build connections, and collectively decide on actions to address community issues, including disaster risks.

Narratives

The second area of the research on relational communication explored use of narratives in promoting civic participation and collective action in DRR. In a relational network, like the one mentioned above, communication is more likely to flow through conversations, stories and narratives shared discursively among the actors - emergency management officials, civil society organizations and community members. I wanted to understand how the narratives exchanged in these conversations help in generating a shared understanding of local hazards, and setting common goals on actions the community members can adopt to reduce disaster risks facing the community. Four dominant themes are found in the narratives shared at the community level – i) *connection and care* that encourages people to care for their communities, stay connected and build a network of support; ii) *everyday hero* that acknowledges the value of simple everyday actions during emergency situations; iii) *collective efficacy* that highlights that community members can work together to achieve risk reduction goals, and iv) *collective responsibility* emphasizing community members' shared duty to address local risks.

I find the narratives are valuable to promote community agency, foster social capital, and encourage collective actions. They also expand the narrow response centric view of disasters by highlighting the importance of collective preparedness and preventive actions in reducing disaster risks. However, in some situations the narratives, particularly the collective responsibility narratives, are contentious, causing confusion, frustration and resistance. This occurs due to reasons such as the narratives being perceived as responsibility transfer strategies of official agencies, or because the narratives contradict traditional understanding of emergency management as emergency response actions.

Social media

Lastly, I was interested in understanding the emerging directions in civic participation communication for DRR – What are the participants increasingly adopting in practice? What has rapidly emerged and taken over the communication space? and, What could be the next big thing? Several references to social media were found in the data, particularly Facebook. Fundamental to the functioning of social media platforms, including Facebook, is a network of users connecting with each other as friends, followers, members of specific groups, sharing information and content, collaborating and mobilizing actions around shared goals - it is a platform built on relational network-based communication. Hence, I explored how social media, particularly Facebook, is adopted in promoting civic participation in DRR.

Previous studies have identified social media's role in the pre-disaster stage in providing and receiving disaster preparedness information, warning, signalling and detecting disasters and implementing crisis communication activities (Houston, Hawthorne, et al., 2015). The study finds social media has two additional functions:

- 1) Social media helps maintain preparedness conversations in regular discourse. Local community Facebook pages are increasingly used by community emergency response volunteers to raise awareness on local hazards and disseminate information shared by official agencies to the community. Local community pages are used by residents in their daily lives to obtain local information and build connections. Consequently, it attracts a wide audience with diverse interests, not just those interested in emergency management. The pages provide platforms for volunteers and emergency management

officials to converse with community members, have a wider reach, particularly among migrant and young population groups, establish a trustworthy source of disaster communication ahead of a crisis. They make preparedness conversations more visible without requiring people to subscribe to specialized emergency management pages or channels and ensure preparedness discussions remain a part of the community discourse - thus serving as an important communication resource.

2) Social media serves as a communication platform for communities of practice in preparedness. Community emergency response volunteers in multiple remote communities across the Selwyn region connect with each other through a Facebook community group specifically created for them. The group serves as the communication resource for the volunteers enabling them to share their learnings, experiences, and seek help from other members as needed. It facilitates exchange of information, ideas, building connections without the logistical barriers of in-person meetings, improve trust and understanding, and promotes social learning.

Our findings highlight that community social media pages are valuable to promote and support civic participation in DRR and are most widely used at the community level compared to other Web 2.0 based applications. Key considerations to better utilize social media are outlined, including considering social media as a parallel media instead of relegating it to a secondary status, establishing credible sources of emergency management information ahead of crisis, and involving local volunteers and emergency management officials to converse with people and moderate conversations. In addition to generic social media outreach, it is important to maintain a presence in social media pages and channels that community members frequent.

Figure 8.6 below presents a graphical overview of the findings on existing communication approaches to support civic participation and collective action in DRR at the community level. It outlines the communication network, the actors, contextual factors, narratives shared, and their outcomes and

concerns.

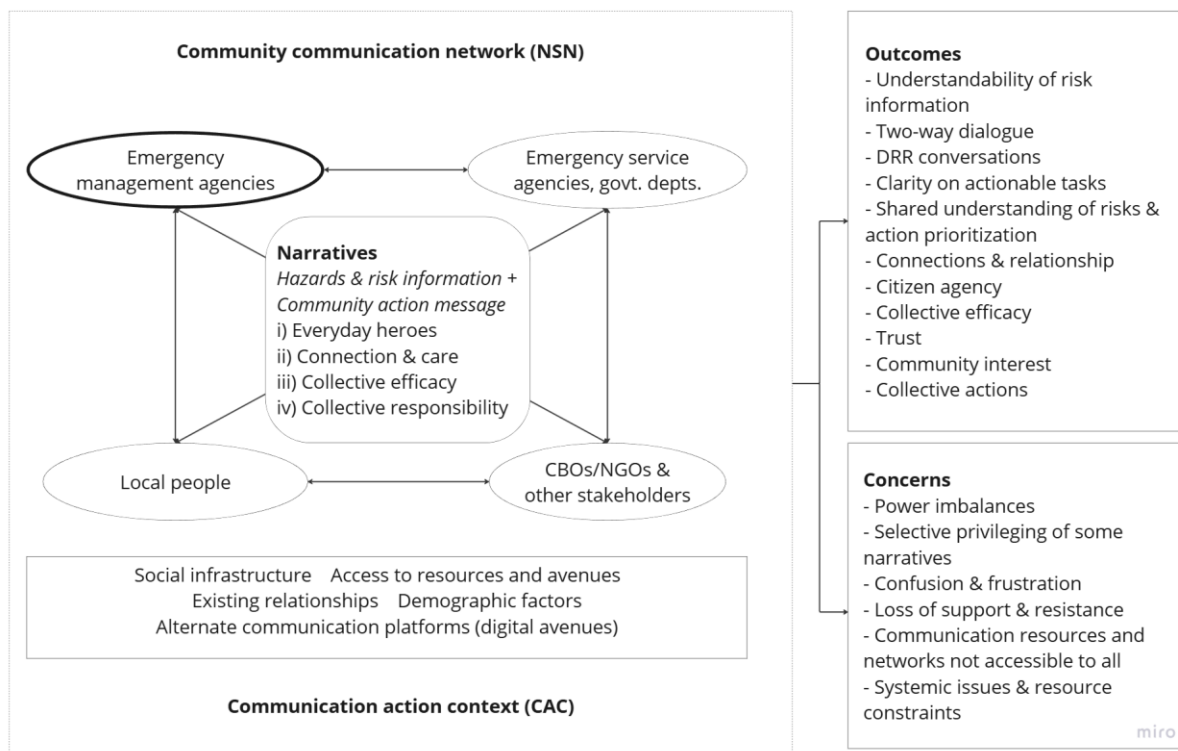


Figure 8.6 – Communication supporting civic participation & collective action in DRR: Graphical overview

Guided by the Communication Infrastructure Theory, the figure shows the network, actors, context, outcomes, and concerns. Figure created using Miro tool.

8.2.2.3 Practical implications

The following considerations are suggested in existing practice based on the findings:

1. Operational suggestions from a relational communication perspective

The findings highlight that consideration of community communication networks (the actors, existing connections, informal ties, etc.), communication resources such as social infrastructure (community centres, cafes, public libraries, etc.), and community context (comfortable safe spaces, existing connections and ties etc.) is crucial when designing communication approaches to promote civic participation and collective action.

It is also important to ensure that the narratives shared align with different people’s mental frames and perceptions of risk and disasters. This can be done by listening to the lived experiences and insights of community members to carefully craft narratives that reflect contextual reality, e.g., knowing the experiences of community leaders and champions before deciding on the narratives, getting their feedback, etc. Emergency management facilitators and communicators have a crucial role in this.

Given that social media was identified as an important communication platform, it is important to develop presence in social media prior to a hazardous event, to identify the social media platforms/pages/channels/handles that people use, and to maintain that presence there rather than relying only on generic social media outreach. This could involve local people as communicators and moderators of conversations on DRR in social media, ensure dedicated staff/volunteer to manage social media presence, and avoid over reliance on social media.

2. Holistic and integrated approach

Emergency management agencies are currently the main communicator about community actions for DRR. This might be because of many reasons such as the infrequency of disasters leading to a lack of public interest, the lingering command-and-control understanding of emergency management, and administrative reluctance to involve the community due to safety concerns. Nevertheless, it is important to involve other communicating actors to improve reach, generate interest, and encourage broader participation.

Compared to initiating community initiatives targeted specifically at DRR, integrating DRR actions with existing initiatives is more effective. Particularly, in areas with poor interest on DRR, capitalizing on other factors such as making communication spaces comfortable, organizing DRR events with events that the community is interested in, leveraging existing networks and informal ties is beneficial.

Working closely with journalists, science communicators and other stakeholders, may be helpful in addressing the gaps in current disaster communication. Mass media narratives are often inadequate at encouraging pre-disaster actions and civic participation, thus alternative communication approaches can help promote the adoption of a disaster preparedness and mitigation angle. Additionally, previous research suggests that geo-ethnic media is an important actor in the community communication network. However, the data indicates that in the community communication network promoting collective action for DRR, geo-ethnic media was largely absent. Future communication strategies can focus on targeted efforts for engaging with geo-ethnic media. This can include neighbourhood social media pages as well.

Compared to disasters, climate change communication is more visible and garners more interest. Communication that integrates climate change and emergency management might help in generating more interest as the two are closely connected when it comes to severe weather events. Additionally, highlighting the role of pre-disaster actions in addressing disaster risks and emphasising people's role in reducing disaster risks may help in shifting the focus from response to prevention.

3. Inequities and power dynamics in relational networks

It is important to note that geographic communities are not singular cohesive units and consist of multiple social networks. Therefore, emergency management agencies need to engage with diverse stakeholders to connect with different sections of the population, particularly underrepresented groups, even in the same neighbourhood. This would require identifying who is not connected to the existing communication networks, understanding what communication networks they use, and finding

ways to connect with them. For example, young people might be better reached through universities, and ethnic groups might be better reached through specific organizations.

While relational networks are beneficial, they can also reinforce existing power dynamics within a community. Marginalized groups are often less connected to communication resources and less visible in these networks. In such inequitable settings, relational communication approaches can result in some voices being prioritized over others, receiving more attention and support, which perpetuates existing disparities. Additionally, relational networks may lead to self-censorship among community members to maintain good relations with government officials and agencies, fearing that poor relations might result in reduced support. It is important to distinguish between the loudest voices and those that need more attention. This can be best achieved by involving skilled facilitators with deep local knowledge who are trusted by the community.

It is important to ensure that the information, resources, and skills that are required to undertake recommended actions are accessible and available, particularly when that recommended action is tied to a responsibility or normative message. If the accessibility to and availability of the above cannot be ensured, then reframe recommended actions as additional actions instead of normative expected actions.

It is also important to exercise caution when using narratives and stories to ensure they are not disempowering, generating feelings of frustration and helplessness. Listening to dissenting community voices, acknowledging counter narratives and continued engagement to build a shared understanding is crucial to not inadvertently disempower people. The development and adoption of ethical guidelines on narratives and storytelling in the DRR context will also be helpful (e.g. Hinwood, 2022). Overall, being cautious about power relations between government agencies and communities and ensuring the power relations are not disempowering is necessary.

The current approach to emergency management in New Zealand relies on a neo-liberal model of risk transfer, which shifts the burden of risk from the state to individuals. Communication is often used to support and justify this shift. However, substantial reduction of disaster risks cannot be achieved through effective communication alone. There is a need to acknowledge issues of resource constraints and create effective avenues to provide necessary support.

4. Systematization of communication approaches and strategies

Often community resources and skills are mobilized through informal relationships and communication networks of community leaders, influencers, local people, government officials and civil society groups, particularly in rural areas. However, formalizing some of these relationships and establishing common operating mechanisms prior to events would be beneficial to reduce reliance on particular people and ensure continuity even in their absence.

Different regional and local emergency management agencies' understanding of communities' role in the emergency management system, implementation of community resilience strategies, communication on expected role of communities, etc., varies widely. While the current approach

varies by region due to context-specific needs, a common understanding and shared narrative on expected community roles in the emergency management system at the national, regional and local level, and the regional differences is necessary to create a shared understanding among the officials and the public and bring clarity.

Key recommendation

Moving forward, it is recommended that communication strategies adopt a holistic perspective considering all four functions of disaster and risk communication - influencing preparedness factors, leveraging networks and relationships, aligning worldviews, and addressing resource constraints. The following four questions might help ensure that communication is integrating all these functions:

- Are we conveying messages about hazards and recommended actions in the best possible way to improve people's knowledge? If not, what knowledge gaps need to be addressed?
- Is everyone connected to the communication network sharing this knowledge? If not, who is left out and how they can be connected?
- Are messages generating a shared understanding considering different lived experiences and worldviews about risks? If not, where is the misalignment and how it can be addressed?
- Can everyone use the knowledge being provided? If not, then what are the barriers to action and what additional supports are needed?

Based on the answer to the above questions, communication strategies can be designed in a way that focus on areas that need attention in the target community and will be more effective in encouraging civic participation and collective action.

8.2.2.4 Theoretical implications

Community participation and disaster and risk communication literature is multi-disciplinary in nature building on theories, and frameworks with distinct philosophies, conceptual foundations, assumptions and aims (McComas, 2006). An important contribution of this study is the development of an integrated model of communication that brings together four theoretical perspectives in disaster and risk communication - influencing preparedness factors, utilizing relational approaches, indigenizing initiatives, and addressing structural barriers - and outlines the guiding theories, concepts, goals, assumptions, and approaches of each. This integration is expected to improve conceptual clarity on types of communicative actions, the range of interacting variables and their potential outcomes - thereby advancing academic discourse on disaster and risk communication. Additionally, the framework contributes to applied communication research by advancing the understanding of different communication approaches, their utility and applicability in different contexts, and serves as a tool to inform the design of communication strategies.

Drawing on the above framework, the thesis also reviews New Zealand literature on disaster and risk communication, identifies underexplored areas of research, and advances research on one such area - relational approaches to disaster and risk communication. The study integrates the somewhat

disjointed bodies of communication literature on disaster preparedness (Balog-Way et al., 2020; Lejano et al., 2018; Ryan et al., 2020), and disaster resilience (Houston, Spialek, et al., 2015; Spialek et al., 2016), and identifies and develops key themes within them relevant to a relational communication perspective – informal networks, community communicators, social infrastructure, community conversations, stories and narratives, trust, reciprocity, and collaboration. Thus, it grounds relational communication approaches in existing literature on disaster and risk communication and develops the knowledge base on such approaches. The study also utilizes the Communication Infrastructure Theory (CIT) (Kim & Ball-Rokeach, 2006a), a communication theory on civic participation and collective action, as the guiding theoretical framework to systematically explore community level collective preparedness communication; thereby expanding CIT’s application within the disaster and risk communication research.

8.3 Contributions of the study

The contributions of the study are mentioned below:

Firstly, New Zealand’s National Disaster Resilience Strategy (2019), states under its third priority, *Enabling, empowering, and supporting community resilience*, a call for collective actions across different sectors of the population to improve disaster resilience in our communities. This study is one of the first in New Zealand, engaging with the idea of “collective action” in the pre-disaster context, exploring what this implies in practice at the community level. Through multiple case studies across different regions in the country, the study examines real-world examples of collective action, detailing their nature, forms, barriers, facilitators, and outcomes. It identifies effective practices, areas for improvement, and provides actionable guidelines and strategies to support collective actions. Thus, this thesis provides research-based insights that directly contribute to attaining the priority three of the Strategy. In doing so, I also highlight some of the broader changes required in the current legislative framework, strategies, and practices to strengthen disaster risk reduction initiatives in the country. These recommendations will help in fulfilling the DRR priorities outlined not only in the Strategy but also in the Sendai Framework for Disaster Risk Reduction, 2015, to which New Zealand is a signatory.

Secondly, the thesis outlines the landscape of people’s participation in DRR. Currently, the term ‘participation’ signifies a range of actions - from community members leading DRR governance to tokenistic forms of disseminating information to communities. Without a systematic understanding of the concept - what it means, what its forms are, which form advances what goals, what their strengths and weaknesses are – developing and applying the concept is difficult as it would signify different things to different people and cause ambiguity. By outlining the different forms of participation based on their goals, the thesis attempts to bring conceptual clarity and address some of this ambiguity. It presents the different understandings of participation in DRR, and elaborates on one form, its strengths, weaknesses, and facilitators. My findings contribute to the foundational literature that needs to be developed to generate a comprehensive understanding of what participation implies in DRR and how best its strengths can be harnessed (refer Chapter 2 and 4).

Thirdly, as disaster management is a multidisciplinary field, the understanding and application of communication to support community participation and actions are influenced by diverse theories and concepts derived from different schools of thought. A significant gap in the current communication literature in New Zealand is that, while the literature is robust in some areas, other areas have not received attention. This research makes a key contribution by identifying this gap through a theoretical framework that integrates insights from multiple disciplines. It also advances understanding in one such under-researched area: the relational approach to communication and provides insights into how informal relationships and community conversations drive collective preparedness behaviours (refer Chapter 2, 5, 6, 7 and 8).

Lastly, this study makes a methodological contribution by using a multi-case design and focusing on community groups as units of analysis, in contrast to the predominant focus on individual-level or single-case studies in disaster preparedness research. This approach allows for more robust insights through thematic analysis and cross-comparisons, offering a clearer understanding of the facilitators and barriers at the community level. This methodological approach can also be replicated in other community settings and the study provides an example of how it can be applied to examine other groups in diverse contexts (refer Chapter 3).

8.4 Limitations of the study

While I attempted my best to ensure a robust quality of research, some limitations exist. Firstly, the type of groups selected. The study examines groups catering to geographical communities – groups working with communities of identities (CoI) were not taken as study cases. While I intended to include them, eventually I could not as I struggled to establish relationships with CoI groups working in DRR or because of situational considerations. For example, relationships with Māori groups need to be built through continued engagement over a period of time. However, by the time, I, a migrant, had these relationships, and became familiar with protocols and practices, my research goals and methods were already decided – it was not co-designed with Māori to meet their priorities. As such, it was not respectful or ethical to conduct research focusing on Māori groups knowing the research was not designed by them, with them, and for them. I was also engaging another CoI group catering to migrant people in Hawke's Bay. However, before the fieldwork, Cyclone Gabrielle 2023 struck and massively impacted Hawke's Bay. Conducting fieldwork in a disaster affected area with impacted communities' post-event should be avoided as much as possible due to ethical concerns. Hence, while I maintained connection with the group, I did not conduct fieldwork. The interview participants from the study groups do represent people from different identities, and I hope that captures some of the perspectives that an analysis focusing on CoI groups would have revealed. Having said this, however, I acknowledge that this remains a limitation of my study.

Secondly, the selection of the study groups. The groups studied in the research were identified through conversations with academics, emergency management officials, and community leaders. Initially, to ensure a wide spread of groups, I reviewed grey literature including newspaper articles and emailed different organizations found referenced within them. However, due to various reasons (like lack of fit with the case selection criteria, focus on knowledge generation instead of risk reduction actions,

difficulty/delay in forming relations), I eventually abandoned this route. The concern is that the groups identified through conversations with academics, emergency management officials, and community leaders are already engaging and represented. While the four groups in the study did not have existing research conducted on them, the study would have benefitted from a wider range and number of groups to further refine and improve the insights.

Thirdly, it was necessary to constrain the scope of this study to fit the PhD timeline and ensure a deep nuanced exploration and analysis of the research questions and findings. Thus, the study focuses on collective action at the community level by community members. However, businesses, service providers, critical infrastructure agencies and other entities are an integral part of community. Collective action at the community level implies a holistic approach considering these different groups and how they can engage collectively. Due to the limited duration of the study, the scope of the study was limited to community members only, however not adopting a holistic perspective remains a limitation of this study.

Another limitation of this study lies in its conceptualization of communication primarily as a tool. The way scholars conceptualize communication influences both analysis and interpretation of findings (Craig, 1999). We frame communication as a tool as the study is applied in nature. While this framing is suitable for the study, a different framing of communication, such as one following the sociocultural tradition which theorizes communication as a process that produces and reproduces social order (Craig, 1999) might have provided a stronger conceptual lens to interpret the tensions observed in the study, such as that between strategic and participatory approaches to communication.

As the research did not initially anticipate that conversational narratives would emerge as a core theme, the analytical approach was not grounded in narrative analysis from the outset. Instead, themes were developed inductively from interviews, observations, and field notes, through which conversational narratives were identified as a core theme. In retrospect, complementing our analysis with narrative analysis would have helped generate richer findings.

Lastly, a major limitation of the study is the quality of the quantitative data. Both the sample size and the geographical distribution of the sample is unsuitable to draw generalizable findings. Additionally, a survey with people who are not participating in collective actions or who were participating but then left such initiatives, would have been beneficial to understand what gaps remain and changes are required. It would also have been beneficial if I could draw on quantitative approaches to examine the communication related findings. However, because relatively few people participate in collective actions to reduce disaster risks, and the groups involved greatly vary across regions, identifying the right groups and securing a sufficient number of survey participants proved challenging. My lack of experience in quantitative approaches also slowed the process. Though the research was designed to be qualitative heavy with minor quantitative components, the quantitative findings are still not robust, and it remains a limitation of the study.

It is also important to highlight that the study was conducted towards the end of the COVID-19 pandemic, in 2021, which affected the conduct of the study and possibly the findings. I had to start

the study overseas due to border closures. Even after I travelled to New Zealand, due to public health concerns, gatherings and events were largely suspended during the initial phase of my PhD. The fieldwork to three sites, except Wellington where I live, could only be commenced from 2023 when travel became safer, and community events were resuming. It limited the chances of being present in the community, engaging in face-to-face conversations, and building trust and relationships with the community, which is particularly important to work with hard-to-reach groups. For safety concerns, during the initial stages I relied only on virtual interviews instead of in-person interviews which would have limited my ability to pick up non-verbal cues and contextual information. Also, I could only interview participants who had access to and were comfortable with digital tools. In some cases, the interview quality was affected by constraints of digital communication, like lag and buffering, and difficulty in joining the call wasting the participants' valuable time. On the other hand, I would presume, the experiences of the global pandemic contributed to a heightened sense of risk perception including for natural hazard risks and strengthened the perceived need for collaborative community actions. These factors might have influenced the overall research direction and outcomes.

8.5 Future research directions

8.5.1 Civic participation and collective action for DRR

This study categorizes the forms of community participation in DRR and discusses one form – participation in public actions in accepted areas of participation (refer Figure 8.2). Future research can utilize this categorization, explore the other forms in detail, and refine the typology. It is also recommended that in the absence of uniform terminologies, the standard practice of outlining the understanding of "participation" at the outset of a project would help maintain clarity and avoid confusion, similar to the treatment of many other social concepts.

The findings also demonstrate mixed results on the success of community-led groups. It highlights that expecting community members to lead community preparedness initiatives is not always effective and factors such as local contexts, diverse stakeholder needs, and strategies for long-term sustainability need to be considered (Delica-Willison & Gaillard, 2012). Future studies could further examine community-led approaches to better understand the factors influencing their success, determine where they are effective or not, and identify what additional support may be needed. These are required to inform policies and practices that empower communities and enable them to reduce disaster risks.

The study identifies limitations in social capital-based approaches towards community involvement and collective action. The findings of this study show that, even in well-connected communities, some groups might not be part of the visible social networks, which can eventually affect the representation of their voices in community processes and their access to resources. This adds to the growing evidence on the potential challenges of social networks and relationship-based approaches to community involvement (Cheshire, 2015; Uekusa, 2020) and introduces a critical perspective to the concept of social capital which has risen in prominence in recent years (Aldrich & Meyer, 2015; Kwok et al., 2019). Expanding social capital research to understand its potential positive and negative

outcomes would be beneficial. For example, valuable questions to explore include whether social capital leads to inclusion or exclusivity, whether it considers minority needs or advances the majority perspective, whether social capital-based approaches are used to reduce government responsibilities and advance neoliberal strategies of responsibility transfer, and what checks and balances are required to ensure social capital can be best utilized to ensure equitable outcomes for everyone in the community.

While this study focuses on community groups, other entities, such as businesses, service providers, critical infrastructure agencies, are also an integral part of the community. Future research could explore how these entities can contribute to collective emergency preparedness and what forms of collective action can be undertaken with, or within, them. Furthermore, it would be helpful to conduct studies with under-represented groups like the youth, migrant people, and others, to gain different insights and identify factors influencing their participation. Particularly in the context of New Zealand's multi-cultural communities, colonial history, and high levels of socio-economic disparity, research engaging with different segments of population would be crucial to build our understanding.

In this study I draw on qualitative data collected from four community groups. Future research can utilize quantitative techniques to draw data from a higher number of community groups from different contexts, to test the findings from this study. For example, quantitative studies could examine the causal factor behind the emergence and sustenance of the group.

It is also important to highlight that a consistent challenge while conducting this study was the usability of the concept of "community" which requires considerable refinement in the context of disasters. There is ongoing debate on the relevance of the concept of community in disasters, with some arguing for the abandonment of the term altogether as it no longer holds relevance. Traditionally, a community refers to interacting groups of people who share significant parameters like a neighbourhood, identity, or interest that shape their experiences, perspectives, values, and practices. However, this notion faces two primary challenges.

- Firstly, the idea of a community as a cohesive unit of people with interactions loses explanatory power as individuals are increasingly belonging to diverse networks of people with varying degrees of interactions. For example, the same person can be part of a neighbourhood club and a global community of activists, with different strengths of ties in each network. Both are communities, yet they are inherently different, and their roles in pre- and post-disaster contexts vary significantly.
- Secondly, the term "community" is often used in disaster research to signify homogeneous, solidaristic collectives of people sharing a neighbourhood, identity, or similar interests. While this simplification makes it easier to select a group of people for study, it fails to capture the fractures, inequities, and power relations inherent in communities, particularly geographic ones. This usage can lead to the mystification, romanticization, and utopian understanding of communities, obscuring the divisions and cleavages within them regarding class, ethnicity, gender, and other variables that contribute to the disproportionate impacts of disasters.

To improve the applicability and value of the concept of “community” within disaster literature, it is essential to engage with different theoretical perspectives of community. Developing this idea with a strong theoretical base, devising alternate methodological approaches for analysing groups of people with shared geography, interest, or identity, and avoiding the uncritical adoption of the term by utilizing the lens of intersectionality is needed to improve the value and applicability of the concept of ‘community’ within disaster literature.

8.5.2 Communication for encouraging civic participation and collective actions in DRR

The thesis proposes an integrated framework of disaster and risk communication drawing on four theoretical perspectives and outlines which theoretical perspective might be beneficial in which contexts. Future research can test the framework in different contexts and assess whether it is suitable to interpret findings and provide a better explanation of observed phenomena. For example, in a community, communication strategies designed utilizing a psychosocial perspective might show poor outcomes. In such context, researchers may examine whether a relational approach or indigenizing perspective, or a combination of both better suited. Engaging with other theories and models of communication that might not have been considered in this study to critique and refine the framework would also be valuable.

In New Zealand, while research on communication for influencing preparedness factors is well advanced, the other three areas of disaster and risk communication remain under-researched. This study advances research in one of those three - the relational perspective of communication. Future research is essential to advance the other two areas – indigenizing approaches to communication and addressing resource and power differentials. For example, it would be valuable to undertake action research with culturally and linguistically diverse groups, understanding varying perspectives on natural hazards risks and acceptable actions and co-designing communication strategies that acknowledge these perspectives. Similarly, it is essential to conduct exploratory studies with people from lower socio-economic backgrounds to identify their barriers to preparedness. These studies should focus on designing communication strategies that not only build on their existing resources and skills to enhance preparedness but also emphasize communicative actions that support their health and well-being across emergencies.

Relational communication strategies are explored in this study. Future studies integrating the relational perspective with another theoretical perspective and exploring communication outcomes through this integrated lens would be valuable. For example, integrating the relational perspective with a power differentials perspective would be suitable to examine how power relations are replicated within the relational communication networks, and how some perspectives become dominant causing communication disparities. Future studies could explore communication networks and resources among hard-to-reach groups, such as migrants and young people, to understand how these can be leveraged more effectively for disaster communication. Research on relational communication approaches could also evaluate the benefits and limitations of different strategies, such as working with trusted communicators, drawing on disaster narratives, or engaging geo-ethnic media, while

testing their applicability across diverse socio-cultural contexts and assessing how they might be integrated with existing practices.

Story and narrative based communication have gained attention in recent years for their ability to engage the audience, convey complex technical information in understandable ways, and help people relate to and interpret information within their own contexts to guide their actions - all of which are crucial to effective communication (Buchtman et al., 2023; Lejano et al., 2020; Shanahan et al., 2019). The findings support these arguments, but they also underscore that the uncritical use of narratives may have negative consequences by causing confusion, delegitimize people's voices, or have other ethical concerns that has received less attention in literature. To advance the knowledge base and improve the effectiveness of narrative based communication, future research on the following areas would be valuable – understanding how conversational narratives, like on disasters, shape community actions in different cultures, evaluation of the short- and long-term impacts of narratives, understanding how (and if) conflicting and counter-narratives emerge within community communication networks, how conflicting narratives influence public opinion, particularly against officially recommended actions, examining whether narratives amplify majority voices while silencing marginalized ones, and the ethical implications of narratives. This critical perspective would advance not only disaster and risk communication literature, but also community participation, collective action and environmental communication literature.

Existing studies on social media usage in disasters primarily focus on the post disaster phase examining how it supports community participation and collective actions by allowing people to establish connections, organize volunteers, seek donations, and mobilize resources (Bhuvana & Aram, 2019; David et al., 2016; Nissen et al., 2021). This study demonstrates social media's role during non-threat pre-disaster periods (Dufty, 2015), and its use in supporting community conversations, engagement and actions for collective disaster preparedness (Comfort, 2016). It advances Houston, Hawthorne, et al. (2015)'s functional framework of social media usage by identifying two additional uses of social media in the pre-disaster stage - maintaining community discourse on preparedness, and being a communication resource for volunteers. The study however shows that while various Web 2.0 tools are being researched and developed to enhance pre-disaster communication, their practical adoption, aside from social media, remains limited. This highlights that while new and innovative technologies are valuable, their contribution would be limited if they do not integrate considerations around ease of use, familiarity, scalability, cost-benefit, security and privacy concerns and use in regular life. Future studies integrating disaster risk communication with research on technology adoption and human computer interactions would be valuable to inform design of communication tools and solutions. Particularly, with the rise of generative AI technologies, such as ChatGPT, it is essential to gain this understanding to leverage these technologies in the best possible ways.

While social media provides an effective communication platform, credibility issues remain a major challenge with social media usage. An interesting finding of the study was that credibility issues (e.g. misinformation, disinformation) commonly associated with social media were not identified as a concern in the pre-disaster stage. It is presumed that factors such as the type of social media group

(open or closed), member vetting processes (public access or police-approved), and the level of moderation could have contributed to addressing the issue. Future research can examine this area further to test factors enhancing the credibility of social media communications, not only for disaster and risk communication, but also in the broader field of communication.

Methodologically, this study relies heavily on qualitative data due to insufficiencies in the quantitative data and explores four community groups engaging in pre-disaster community actions at the grassroots level. Quantitatively evaluating the findings of this study with a larger number of community groups from diverse contexts, while mapping their communication networks, resources, and the broader communication ecology, would help improve the validity and generalizability of the findings.

8.6 Conclusion

Ample evidence suggests that the impact of natural hazards can be significantly reduced if ‘at-risk’ communities are involved and empowered to prepare for and mitigate hazard risks in the pre-disaster stage. It needs to happen through both individual actions, and collective actions. Such collective actions include creating community response plans to inform community action post extreme events, implementing mitigation strategies to minimize hazards impacts, collective resource mobilization to reduce hazard exposure and other collaborative actions. However, limited literature from New Zealand explores collective actions for reducing disaster risks and the factors that support or impede it. In this context, this thesis aims to firstly, understand the nature and forms of collective actions in New Zealand; and secondly, identify how communication can be better utilized to support such collective actions. The overarching research question is: *“How do people participate in collective actions for disaster risk reduction in New Zealand and what communication practices are employed to promote the same?”*

The research gains significance given the current legislative emphasis on supporting community participation and collective actions in communities for reducing disaster risks. Policy and strategy documents guiding emergency management efforts in New Zealand - like the Civil Defence Emergency Management Act 2002, National Civil Defence Emergency Management Plan 2015, and National Disaster Resilience Strategy 2019 – all emphasize community engagement and participation in reducing disaster risks. The National Disaster Resilience Strategy 2019 explicitly calls *collective actions* by different stakeholders within the community to advance national resilience. Similar priorities are set in the global Sendai Framework for Disaster Risk Reduction, 2015, to which New Zealand is a signatory. Therefore, it is imperative to produce academic literature that support the advancement of these priorities.

The thesis addresses the first part of the research question by providing a comprehensive overview of the various ways in which local people engage in collective actions for reducing disaster risks at the community level in New Zealand. First, the existing literature was organized, to identify the different forms of participation and collective action in DRR. Then, utilizing a multi-case qualitative approach, I systematically explored the current state of civic participation and collective action in DRR within New

Zealand communities. The study identifies three distinct forms through which people participate in DRR, and discusses their nature, facilitators, barriers, and outcomes. These findings provide conceptual clarity on civic participation and collective action in DRR at the community level and serves as an evidence base to inform strategies and policies for supporting collective efforts and enhancing civic participation in DRR. Additionally, the study also reveals that New Zealand's current approach to emergency management at the community level remains response-centric and argues for an inter-departmental integrated approach to prevent the creation of new disaster risks.

To answer the second part of the research question on communication practices, disaster and risk communication literature was synthesized and four theoretical traditions on were identified: influencing preparedness factors, utilizing relational approaches, indigenizing initiatives, and addressing structural barriers. Given that relational communication approaches provide a novel lens to understand how communication influences participation, but remain underexplored in New Zealand, I adopted this lens to guide the study. In particular, Communication Infrastructure Theory (CIT) was utilized as it provides a robust framework for understanding community level communication for civic participation and collective action, making it well-suited for the study. Guided by CIT, I outline the community communication network (NSN), the actors and resources embedded in the network and the contextual factors (CAC) that influence community conversations on disasters and foster or constrain civic participation and collective action in DRR. I also examine the community conversations and narratives flowing within the community communication network (NSN). Communication to promote civic participation in disasters preparedness heavily rely on conversations and two-way dialogue between emergency managers, community members and other stakeholders. The conversations flow through narratives and stories about disasters and hazards, rather than scientific information and argumentation. So, I studied the narratives to identify the recurring themes and explored how (if) the narratives promote collective actions, understand their benefits, and determined key considerations for their effective use. Additionally, I explored the use of an emerging communication infrastructure, social media, at the community level, to understand how they support collective action on disaster preparedness and discuss the opportunities and considerations. The findings contribute not only to disaster and risk communication literature but also have applicability in the fields of climate change and environmental communication, public health, and community development.

In sum, this thesis set out to understand communication practices that support civic participation and collective action for disaster risk reduction. It synthesizes four traditions of disaster and risk communication literature to develop an integrated model. Focusing on one of these traditions, relational communication, the thesis examines how key elements of such communication, community communicators, communication infrastructure, and narratives influence civic participation and collective action in New Zealand. The findings provide insights on relational communication, and contributes to literature on communication, civic participation and collective action. By advancing research in this direction, I expect the thesis will contribute to improving communication for collective actions and will help in empowering communities to reduce disaster risks and strengthen the nation's resilience.

Appendix 1 Glossary and key terms

Term	Definition
Community	Communities refer to groups of people who share same geographic location, demographic characteristics (gender, race etc.) or interests (leisure activities, common interests etc.), and from which people derive a sense of identity and belonging.
Community group	Community groups or collectives are collections of individuals who come together to advance shared interests, goals, or concerns in the community. e.g. Community emergency response teams, residents' associations
Civic participation	People's activities either as an individual, or as part of a group in the political, social, and community life beyond the responsibilities of family and household that contribute to the quality of life in the community. e.g. attending public meetings, advocating for policy changes, volunteering etc.
Collective action	Actions undertaken by jointly and voluntarily by groups of people to advance a shared goal or mutual interest. e.g. joint efforts by landowners to mitigate wildfire risks in properties lying on forest boundaries
Disaster management or emergency management	Disaster management, alternatively called emergency management, refers to the organized efforts to prepare for, mitigate, respond to, and recover from the impacts of extreme events. It includes strategies, policies, and activities aimed at reducing the disaster risks and the impacts of hazards on life and well being of people. In New Zealand, emergency management is typically referred to a civil defence emergency management (CDEM).
Disaster risk reduction	Reducing disaster risks by systematically acting on the elements that cause disasters, including reducing vulnerabilities and exposure of people, improving preparedness to adverse events, and undertaking activities that fit within the broader context of sustainable development.
Disaster resilience	Disaster resilience refers to the ability of individuals, communities, organizations, and systems to anticipate, prepare for, adapt to, and recover quickly from the impacts of disasters minimizing the disruption caused by disasters.
Disaster preparedness	Disaster preparedness refers to the planning and pre-emptive actions taken to ensure individuals, communities, organizations, and governments are ready to respond effectively to disasters. It includes activities such as building hazard awareness of people, improving their knowledge and skills on disaster preparedness, and resourcing people to mitigate hazard risks.

Communication	Communication refers to the social interaction of actors through which information is shared, interests are negotiated, behaviours are shaped, and actions are influenced. In this study, I consider all formal and informal processes through which disaster risk is communicated. e.g. communication of preparedness messages from government agencies to the public to informal conversations on disaster risk among community members.
Relational communication approaches	Relational communication approaches recognize that people are socially situated, and that people's social networks and connections significantly influence how they access information, interpret them and act on the information. Therefore, relational communication approaches focus on leveraging the networks of relationships to attain the communication goals. Particularly, it aims at improving trust and forming mutually beneficial relationships to promote desired actions.
Communication infrastructure theory	Communication infrastructure theory (CIT) proposed by Kim and Ball-Rokeach (2006) conceptualizes the communication systems within a community as networks of communicating actors and communication resources. People engage with this communication infrastructure to acquire information, make decisions, and perform routine tasks. The theory argues that the communication infrastructure in a community influences the nature of civic participation in a neighbourhood. In this research, I utilize CIT as the guiding framework to examine community level communication – the communication networks, actors and resources - that promote civic participation and collective action in DRR.
Narrative	Narratives emerge from the everyday stories and conversations that media, community organizations and local people engage in and share. It portrays interconnected events and characters in a specific space and time structured in a cause-and-effect format.
Participatory communication	Participatory communication focuses two-way dialogue and communication among different stakeholders with the goal of equalizing power relations through shared ownership of communication processes and outcomes.
Public relations	Public relations refer to strategic communication processes aimed at improving the relation dynamics and forming mutually beneficial relationships between organizations and the publics.

Appendix 2 Human ethics notification

Manomita Das

From: humanethics@massey.ac.nz
Sent: Thursday, 26 August 2021 11:29 am
To: Manomita Das; J.Becker@massey.ac.nz
Cc: humanethics@massey.ac.nz
Subject: Human Ethics Notification - 4000024945

HoU Review Group

Ethics Notification Number: 4000024945
Title: Applying Risk Communication to encourage Collective Action for Disaster Risk Reduction

Thank you for your notification which you have assessed as Low Risk.

Your project has been recorded in our system which is reported in the Annual Report of the Massey University Human Ethics Committee.

The low risk notification for this project is valid for a maximum of three years.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

A reminder to include the following statement on all public documents:

"This project has been evaluated by peer review and judged to be low risk. Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz. "

Please note that if a sponsoring organisation, funding authority or a journal in which you wish to publish require evidence of committee approval (with an approval number), you will have to complete the application form again answering yes to the publication question to provide more information to go before one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

You are reminded that staff researchers and supervisors are fully responsible for ensuring that the information in the low risk notification has met the requirements and guidelines for submission of a low risk notification.

If you wish to print an official copy of this letter, please login to the RIMS system, and under the Reporting section, View Reports you will find a link to run the LR Report.

Yours sincerely

Professor Craig Johnson
Chair, Human Ethics Chairs' Committee and Director (Research Ethics)

Appendix 3 Interview guide

For people facilitating civic participation and collective action

- **Introducing the research**
- **Interview Guide**

Govt officials/Non Govt officials

1. In your regions, what are the domains and activities of disaster management where community is involved?
2. Do you know of any DRR initiative in your regions where people in or outside the community have come together to address a community wide need? If yes, what kind of initiatives have people participated in?
 - a. Are any of them in relation to protecting people from a hazard? like soil erosion or wildfire. If yes, please describe.
 - b. Are any of them in relation to preparing for a disaster? Collecting preparedness resources, Community shelter, Neighbourhood plans, etc., If yes, please describe.
3. What prompted the community to come together?
 - a. Can you explain how the initiative started? An event? A person, or group of people? Or some other initiator (e.g., a call for funding opportunities or external agency)
 - b. What facilitated the process and what were the challenges faced/lessons learnt?
4. Why do you think people get involved in community-based initiatives for DRR in New Zealand? Optional: Were the initiatives successful in achieving what they set out to do? What do you think were the driving factors behind the success (or failure) of the initiative?
5. How do you engage with the community for DRR in a pre-disaster situation?
6. How do you encourage community members to participate in DRR activities?
 - a. Note - Source, Message, Content, Repeaters, Channel
 - b. What strategies of engagement do you find most effective?
7. Why are the communication approaches designed in the way it is?
 - a. What decides on the message content and processes to be adopted for engagement?

Additional question for Govt. Officials

The national disaster resilience strategy which came into effect in 2019 mentions under priority 3 the need to enable everyone to participate in and contribute towards disaster resilience.

8. How is this being implemented in your region?
 - a. Projects, Objectives, Activities, Stakeholders, Approaches to make others participate, Facilitators and Challenges in the process.

Concluding the interview

For people participating in civic participation and collective action

- **Introducing the research:**

CA initiative Leaders

1. Tell me more about <<Project name>>
 - a. Note: Project objective, Project milestones and activities, Origin of the project, Who leads the project, Mode of operation, In-house communication processes and communication with external stakeholders, Type of participants, Role of community in the project, Other stakeholders and their role.
2. What prompted you to take up this project? (might include “who” prompted you – but I like the “What” framing in the first instance)
3. What encourages you to stay involved with this project?
4. How do you inform others about the need of this project and encourage others to join the project?
 - a. Note Source, Message, Content, Repeaters, Channel
 - b. What communication approach did you find most effective?
5. How do you encourage participants to continue their involvement in the project?
 - a. Note Source, Message content, Repeaters, Channel
 - b. What communication approach did you find most effective?
6. What played a key role in bringing the community together for the project?
 - a. Note any circumstantial factor (like a wildfire), policy level changes and other factors
 - b. Persons/groups who played a key role in initiating the project
7. Were the initiatives successful in achieving what they set out to do? Why do you think this project has been successful (or failure)?
8. What were the challenges faced/lessons learnt?
9. How did you overcome these challenges?

CA Participants

1. How did you come to know about the project?
 - a. Note down the Source, Message content, Repeaters, Channel
2. What encouraged you to get involved in the project?
3. What motivated you to continue your engagement in the project?
4. What do you enjoy about the project?
5. What do you think played a key role in bringing the community together?
6. Were the initiatives successful in achieving what they set out to do? Why do you think this project has been successful (or failure)?
7. What were the challenges you faced? How did you overcome them?
8. Do you encourage others to participate in this project?
 - a. If yes, How? What do you find most effective while encouraging others to participate in such projects?

- **Concluding the interview**

Appendix 4 Observation Guide

Observation Guide - Applying Communication to encourage Collective Action for Disaster Risk Reduction

Background: This observation guide will be used for collecting primary data related to my PhD research on *Applying Communication to encourage Collective Action for Disaster Risk Reduction*. The observation data will be used to substantiate the data collected through interviews and add on to them. Through this data I will get a better understanding of the context where communication is happening, gain first-hand experience and learn anything that my interviewees may have missed out on. It will be used to observe public meetings, community events, workshops and other group activities. These activities are used by community groups and other stakeholders to engage with community members. I will be present in these activities as non-participant observer to understand what communication is happening by whom, how it is happening and what the impacts are.

Purpose and research goals of the observations: The primary aims for the observations are as follows:

- To document what is happening in the meetings and events including who is participating, what activity is happening, when and where, how the activity is organized, how topics are raised, how decisions are made, what are the points of disagreement, how are they resolved (How community engagement is happening?)
- To observe what is discussed about disaster risk reduction, preparedness and mitigation and by whom? To identify what information is shared, why and how it is shared, and by whom? (What message is communicated?)
- To observe the message characteristics, the pattern and flow of communication, and tools and techniques used to communicate (What are the SMCR-N characteristics?)
- To identify how community groups, citizens and other stakeholders interact and engage in dialogue (How is engagement and participation happening?)
- To observe the effects of communication in engagement and action (What are its impacts?)
- To collect all available documents for further analysis

Observation methodology

- Research ethics – Inform participants about the research, address their questions, take their consent. Take photographs, audio/video record if everyone consents.
- Take time logged field notes. 4 column formats with topic, description, quotes/observation and interpretation. All entries may not have value in every column.
- Describe the setting – where the activity is happening, what the physical space looks like, who are present, what time and date etc. Draw the physical setting where possible.
- Describe my mindset, and note if anything significant happened/anything I read may affect my lens.

- Describe the workings within the setting – what is the context, what is the atmosphere, how are people interacting, what procedures are being followed etc.
- Describe what is actually happening – Describe what is being discussed, who is discussing it, what words they are using, what techniques they are using, what dialogue is happening, what decisions are being made
- Describe what I am seeing and thinking - are people engaged, are people happy or unhappy about something, how dialogue is happening, how much people in power positions are directing the conversations, how much common people are engaging in the conversations, how it is taken by other members, do people look encouraged
- Subjective interpretations – Note any subjective interpretation that I can make based on something I observe in a separate column in the fieldnotes, linking it to the evidence
- Note follow up questions that need clarification and set up discussion with KI.

Appendix 5 Survey questionnaire

Survey on motivations for engaging in collective action for disaster preparedness

Kia ora,

We are a group of researchers from Massey University in Wellington. We want to know why people come together to prepare for disasters like earthquakes and floods in New Zealand. It is important for communities to be strong and ready for disasters, and having people work together is a big part of that.

To find out more, we are doing a survey to understand what motivates people to participate in disaster preparedness related groups. The information we gather will help us create better programs to support these groups and their efforts to get ready for disasters.

Thank you for your interest in our survey!

Kind regards,

Manomita and team

Key information about the survey

- No participants will be identifiable, and results from the survey will be generalised across populations.
- This survey should take only 10 - 20 minutes for you to complete.
- Results will be published in reports and/or papers and will be accessible to participants.
- This survey closes at 5pm Friday 1st November 2023.
- For further information about the study please contact: Manomita Das, 0221868137, manomita.das.1@uni.massey.ac.nz.

Ethics statement

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz.

Thank you for your time.

Filling out the survey implies that you are over the age of 18 and you consent to participating in this research.

Survey on motivations and facilitators for engaging in collective action for disaster preparedness

We want to understand what inspires people to volunteer in emergency management. Your input is incredibly important to us, and we sincerely appreciate your willingness to consider taking part in the survey.

1. Do you volunteer for disaster preparedness?

In the past 36 months, have you participated in any formal or informal unpaid activity related to emergency management that will benefit not only you and your family but also the community? *e.g., Attended community consultation meetings, be member of community emergency teams, worked with neighbours to make evacuation plan, shared tools or resources with an agency working on emergency management etc.*

Yes () No ()

2. Do you volunteer in any other organizations?

Yes () No ()

If yes, kindly mention the activity (or the type of activity) that you volunteer for.

3. Have you experienced any of the following due to natural hazards such as earthquakes, floods, landslides etc.? Please tick (✓) all that apply.

You have been **harmed**.

You have suffered **damages** to your home or possessions.

You have been **impacted** (e.g., livelihood affected, needed to move home).

Someone **close to you** was harmed, impacted, or suffered damages.

Someone **within the broader community** was harmed, impacted, or suffered damages.

The hazard did not affect you but made you feel **scared** or **vulnerable**.

You did not experience any of the above.

4. Have you had any training or education in natural hazards, or work in a job that considers natural hazards?

Yes () No ()

5. How long have you lived in this city/town/village? (e.g., 5 years 6 months)

_____ years _____ months

6. Please rate how you feel about the following statements.

While answering, think about your volunteering experience in emergency management and preparedness.

Statement (I volunteer because ...)	Rating (tick as appropriate)				
	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
My community could experience a disaster.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My actions can reduce the effects of a disaster.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We need to be prepared for situations when external help is not readily available.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have a clear understanding of what I should do as a preparedness volunteer.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have skills/knowledge/ability to improve the preparedness of my community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe in my community's ability to work together to improve our preparedness.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have sufficient resources, time, and energy to volunteer in preparedness.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe participating in disaster preparedness activities will lead to a better prepared community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am deeply moved (fear, anger, hope etc.) by what may (is) happen(ing) in my community during an emergency.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe only by organizing ourselves as a group we can improve our preparedness.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I want to make us a better prepared community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
By volunteering in preparedness, I can help others in my community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Volunteering in preparedness is the right thing to do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I trust the group will fulfil its roles and responsibilities.	○	○	○	○	○
I feel inspired by the group's leader(s).	○	○	○	○	○
I feel responsible for me and my family's safety.	○	○	○	○	○
I feel responsible for my community's (neighbours, students, friends etc.) safety.	○	○	○	○	○
I should contribute to the safety and well-being of my community.	○	○	○	○	○
I identify myself as a prepared person.	○	○	○	○	○
Someone asked me to join the group on emergency preparedness.	○	○	○	○	○
It was expected of me to volunteer on emergency preparedness.	○	○	○	○	○
I enjoy working with my peer volunteers on emergency preparedness.	○	○	○	○	○

7. What is your main motivation to volunteer?

8. How did you come to know about the emergency management and preparedness group for which you are currently volunteering?

9. Who informed you about the emergency management and preparedness group for which you are currently volunteering?

10. Do you have any other comments you would like to share?

11. Demographic information

a. Age Group

- below 18 18 – 30 31 – 45 46 – 60 61 - 75 Above 75

b. Gender _____

c. Ethnic group(s) that you identify with

d. Highest level of Education

- No school qualifications
 Secondary school qualifications
 Trade certificate, professional certificate, or diploma
 University undergraduate degree (e.g., Diploma or bachelor's degree)
 University postgraduate degree (e.g., Honours, Masters, Ph.D.)
 Prefer not to say

e. Household income in the last twelve months in NZD

(This question is not mandatory)

- Zero income 1 – 30,000 30,001 – 60,000
 60,001 – 90,000 90,001 – 12,000 Above 120,000

f. City/Town/Village _____

Thank you for participating in the survey!

We are looking for more participants. If you know someone who would be interested in taking the survey, please share the survey link with them.

Appendix 6 Information Sheets



Applying Communication to encourage Collective Action for Disaster Risk Reduction

Information Sheet

Hello, my name is **Manomita Das** and I am a PhD candidate at the **Joint Centre for Disaster Research** at Massey University, Wellington. I am conducting research on the topic “Enhancing disaster communications for collective actions” and would like to **invite you to participate in an interview** related to this research. Please read the information provided below carefully, and kindly consider participating in this research. If you would like to participate, or have any queries, please do email me at Manomita.Das.1@uni.massey.ac.nz.

What is this research?

Aotearoa New Zealand is vulnerable to multiple natural hazards such as tsunamis, earthquakes, floods, etc. To reduce the risks posed by these hazards, various collective initiatives have emerged across the country where groups of people have come together and collaborated to take preventive and precautionary action against the hazard risks. My PhD research is examining these collective initiatives to answer two questions:

- i) Why, when, and how do such collectives emerge?
- ii) How can communication approaches be used to facilitate the formation and sustenance of such collectives?

Disaster researchers and emergency management professionals acknowledge the importance of people’s collectives to build a disaster resilient Aotearoa New Zealand; and therefore, the ultimate goal of this research is to learn more about these hazard related collectives, and identify pathways to promote them across the country.

Who are the researchers?

I, **Manomita Das**, am a PhD candidate at Massey University and am the lead researcher for this study. My supervisors are **Dr Julia Becker** and **Dr Emma Hudson-Doyle**, both Senior Lecturers at Massey University, Wellington. This research is supported by **Resilience to Nature's Challenges** which is a country wide programme hosted by GNS Science and funded by the Ministry of Business, Innovation, and Employment (MBIE). Read more at <https://resiliencechallenge.nz/>.

Who can take part in this research?

We are seeking participants who are/were involved in hazard related collectives. We are also looking for participants in governmental organizations, non-governmental agencies, or civil society who have worked or are working closely with such collectives or promoted such collectives in any way. Please write to us by email (Manomita.Das.1@uni.massey.ac.nz) if you want to participate in the research and are unsure whether you meet the eligibility conditions. If you have received an email invite from us to participate in the study, we have obtained your email from publicly available sources or you have been recommended to us by key contacts of the researchers or by other research participants.

What will my involvement in the research mean?

Depending on your availability, a 60-to-90-minute interview will be scheduled on a mutually agreed upon date. The interview will either be conducted in person at a location that is convenient to you (e.g., either at Massey University, your workplace, or a public library or café) or over Zoom (or your preferred conferencing platform). The interview can also be arranged over email if you would prefer.

The interview will involve questions on hazard related collectives that you know about or have been a part of. Questions will also explore how community members become involved in collectives, what facilitates or challenges the formation of the collectives, and what approaches are used to boost the collectives. Before the start of the interview, you will need to sign a consent form saying you understand what the project is and that you are willing to participate in the research. During the interview I or a research assistant will take notes. With your permission, the interview will be audio recorded and later, transcribed for analysis.

There are no known or anticipated risks to you as a participant in this study.

What happens to the data collected from me?

All information and data that you provide will be considered confidential. Interview transcripts will be anonymized and will be stored in a secure location at either the Joint Centre for Disaster Research (School of Psychology, Massey University, Wellington, NZ), or via a password protected encrypted online data storage facility (Dropbox). All data will be held in this secure location for five years post research completion, and stored by methods that comply with the Massey University Code of Ethical

Conduct. The only persons with access to this data will be the current research team. No individuals or organisations will be named in any reports or publications, however, anonymous quotations from the interviews may be used.

What happens to the research findings?

The findings of the study will inform emergency management practice and help in designing strategies to encourage community involvement and participation in disaster risk reduction related collectives. The findings will also be communicated to the national and international research community and emergency management sector via presentations at various conferences in the next few years. In addition, the data may be used for publications in journals and magazines.

What are my rights as a participant?

Whilst your contribution would be most appreciated, **you are under no obligation to participate in this research**. Following the Massey University Code of Ethical Conduct, *you have the right to:*

- *decline to answer any particular question;*
- *withdraw from the study at any time before the results are sent for publication;*
- *ask any questions about the study at any time during participation;*
- *provide information on the understanding that your name will not be used unless you give permission to the researcher;*
- *ask for the recorder to be turned off at any time during the exercise and discussion;*
- *ask for a summary of the project findings when it is concluded.*

Thank you for taking time to read this. If you have any questions or comments, please feel free to contact us.

Contact details of the research team:

Manomita Das, Ph.D. Candidate, Joint Centre for Disaster Research, Massey University, Wellington.

Email: Manomita.Das.1@uni.massey.ac.nz, *Phone:* +64221868137

Dr Julia Becker, Senior Lecturer, Joint Centre for Disaster Research, Massey University, Wellington.

Email: J.Becker@massey.ac.nz, *Phone:* +6449793604

Dr Emma Hudson-Doyle, Senior Lecturer, Joint Centre for Disaster Research, Massey University, Wellington.

Email: E.E.Hudson-Doyle@massey.ac.nz, *Phone:* +6449793616

This project has been evaluated by peer review and judged to be low risk (Ethics Notification No - 4000024945). Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz.

**JOINT
CENTRE FOR
DISASTER
RESEARCH**



MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Motivations for Collective Action and Civic Participation in Disaster Preparedness

Information Sheet

Hello, my name is **Manomita Das** and I am a PhD candidate at the **Joint Centre for Disaster Research** at Massey University, Wellington. My PhD is on the topic “Communication for Collective Action in Preparedness”. I would like to **invite you to participate in a survey** related to this research that examines **motivations for collective action and civic participation in disaster preparedness**. Please read the information provided below carefully, and kindly consider participating in this research. If you have any queries, please email me at Manomita.Das.1@uni.massey.ac.nz.

What is this research?

Aotearoa New Zealand is vulnerable to multiple natural hazards such as tsunamis, earthquakes, floods, etc. To reduce the risks posed by these hazards, various collective initiatives have emerged across the country where groups of people have come together and collaborated to take preventive and precautionary action against the hazard risks. My PhD research is examining these collective initiatives to answer two questions:

- iii) Why, when, and how do such collectives emerge?
- iv) How can communication approaches facilitate the formation and sustenance of such collectives?

Disaster researchers and emergency management professionals acknowledge the importance of people’s collectives to build a disaster resilient Aotearoa New Zealand; and therefore, the ultimate goal of this research is to learn more about these hazard related collectives, and identify pathways to promote them across the country.

Who are the researchers?

I, **Manomita Das**, am a PhD candidate at Massey University and am the lead researcher for this study. My supervisors are **Dr Julia Becker** and **Dr Emma Hudson-Doyle**, both Senior Lecturers at Massey University, Wellington. This research is supported by **Resilience to Nature’s Challenges** which is a country wide programme hosted by GNS Science and funded by the Ministry of Business, Innovation, and Employment (MBIE). Read more at <https://resiliencechallenge.nz/>.

Who can take part in this research?

We are also looking for participants in governmental organizations, non-governmental agencies, or civil society who have worked or are working closely with community groups working on civil defence

or environmental protection. Please write to us by email (Manomita.Das.1@uni.massey.ac.nz) if you want to participate in the research and are unsure whether you meet the eligibility conditions. If you have received an email invite from us to participate in the study, we have obtained your email from publicly available sources or you have been recommended to us by key contacts of the researchers or by other research participants.

What will my involvement in the research mean?

You are invited to answer an online survey that will gather information on your motivations to volunteer in civil defence or environmental protection. The survey form typically takes 10 to 15 minutes to answer. There are no known or anticipated risks to you as a participant in this study.

What happens to the data collected from me?

All information and data that you provide will be considered confidential. Data will be anonymized and will be stored in a secure location at either the Joint Centre for Disaster Research (School of Psychology, Massey University, Wellington, NZ), or via a password protected encrypted online data storage facility (Dropbox). All data will be held in this secure location for five years post research completion, and stored by methods that comply with the Massey University Code of Ethical Conduct. The only persons with access to this data will be the current research team. No individuals or organisations will be named in any reports or publications.

What happens to the research findings?

The findings of the study will inform emergency management practice and help in designing strategies to encourage community involvement and participation in disaster risk reduction related collectives. The findings will also be communicated to the national and international research community and emergency management sector via presentations at various conferences in the next few years. In addition, the data may be used for publications in journals and magazines.

What are my rights as a participant?

Whilst your contribution would be most appreciated, **you are under no obligation to participate in this research**. Following the Massey University Code of Ethical Conduct, *you have the right to:*

- *decline to answer any particular question;*
- *withdraw from the study at any time before the results are sent for publication;*
- *ask any questions about the study at any time during participation;*
- *provide information on the understanding that your name will not be used unless you give permission to the researcher;*
- *ask for a summary of the project findings when it is concluded.*

Thank you for taking time to read this. If you have any questions or comments, please feel free to contact us.

Contact details of the research team:

Manomita Das, Ph.D. Candidate, Joint Centre for Disaster Research, Massey University, Wellington.

Email: Manomita.Das.1@uni.massey.ac.nz, *Phone:* +64221868137

Dr Julia Becker, Senior Lecturer, Joint Centre for Disaster Research, Massey University, Wellington.

Email: J.Becker@massey.ac.nz, *Phone:* +6449793604

Dr Emma Hudson-Doyle, Senior Lecturer, Joint Centre for Disaster Research, Massey University, Wellington.

Email: E.E.Hudson-Doyle@massey.ac.nz, *Phone:* +6449793616

This project has been evaluated by peer review and judged to be low risk (Ethics Notification No - 4000024945). Consequently it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email humanethics@massey.ac.nz.

Appendix 7 Consent Form for interviews



Applying Communication to encourage Collective Action for Disaster Risk Reduction

Participant Consent Form

I have read the Information Sheet and have had the details of the study explained to me. My questions have been answered to my satisfaction. I understand that I may ask further questions at any time and/or withdraw from the study before or during the interview.

- I agree to my interview being recorded.
- I agree to the use of anonymous quotations in any publication that comes of this research.
- I agree to participate in this study under the conditions set out in the Information Sheet.

Signature:

Full Name:

Date:

If preferred, a virtual online version of this individual consent form can be found here:

https://massey.au1.qualtrics.com/jfe/form/SV_8HyCq1Uf5npLnbo

Appendix 8 List of Codes

Sl no.	List of codes
1	CA approach
2	CA/Group context
3	CA/forms
4	CA/forms/based on local needs
5	CA/forms/interest groups
6	CA/forms/varying interpretation of CA
7	CA/forms/challenge/lack of consistency
8	CA/activities/prescriptive preparedness tasks like making plans, drills
9	CA/activities/forum of existing groups
10	CA/activities/lead group and co-ordinate
11	CA/activities/ideate and localize initiatives
12	CA/activities/maintain resources
13	CA/activities/maintain relations
14	CA/activities/knowledge-holder
15	CA/activities/secure funds
16	CA/activities/liaison with community
17	CA/activities/initial response in anticipation/after an event
18	CA/activities/own initiatives
19	CA/activities/advocacy
20	CA/activities/be community voice
21	CA/activities/challenge/dealing with uncertainty in emergencies
22	CA/activities/challenge/accountability
23	CA/activities/ground level information
24	CA/activities/up to date information
25	CA/activities/pre-event watch
26	CA/activities/potential hazard signs
27	CA/challenges/underrepresented groups
28	CA/challenges/dealing with guilt, emotional effects
29	CA/challenges/nature of community
30	CA/emerge/specifics
31	CA/emerge/hazard experience
32	CA/emerge/hazard awareness
33	CA/emerge/CDEM initiated
34	CA/motivators, facilitator and barrier/Hazard experience
35	CA/motivators, facilitator and barrier/Risk perception
36	CA/motivators, facilitator and barrier/Wanting to be safe
37	CA/motivators, facilitator and barrier/self-reliant mindset
38	CA/motivators, facilitator and barrier/caring for family safety
39	CA/motivators, facilitator and barrier/caring about the town

40	CA/motivators, facilitator and barrier/Caring for community
41	CA/motivators, facilitator and barrier/feeling responsible for community
42	CA/motivators, facilitator and barrier/sense of responsibility
43	CA/motivators, facilitator and barrier/sense of responsibility coming from a role
44	CA/motivators, facilitator and barrier/community minded
45	CA/motivators, facilitator and barrier/Looking out for others
46	CA/motivators, facilitator and barrier/want to help
47	CA/motivators, facilitator and barrier/Altruistic values and ideology
48	CA/motivators, facilitator and barrier/Small connected community
49	CA/motivators, facilitator and barrier/connected neighbourhood
50	CA/motivators, facilitator and barrier/rural community
51	CA/motivators, facilitator and barrier/connections among people
52	CA/motivators, facilitator and barrier/having interested people
53	CA/motivators, facilitator and barrier/Stable population - living for long time
54	CA/motivators, facilitator and barrier/place attachment
55	CA/motivators, facilitator and barrier/for wellbeing of future generation
56	CA/motivators, facilitator and barrier/Safeguard what we have here - "a good thing that needs to be protected"
57	CA/motivators, facilitator and barrier/Feeling of a need for change
58	CA/motivators, facilitator and barrier/Actionable info/Feasible list of things to do
59	CA/motivators, facilitator and barrier/Actionable info/Info on how people can get engaged
60	CA/motivators, facilitator and barrier/easy entry paths
61	CA/motivators, facilitator and barrier/offering multiple ways of engagement
62	CA/motivators, facilitator and barrier/reducing entry barriers
63	CA/motivators, facilitator and barrier/respectful engagement
64	CA/motivators, facilitator and barrier/valuing people's contribution
65	CA/motivators, facilitator and barrier/Generate people's interest
66	CA/motivators, facilitator and barrier/Positive outcome expectancy
67	CA/motivators, facilitator and barrier/efficacy beliefs
68	CA/motivators, facilitator and barrier/confidence in skills - self, collective
69	CA/motivators, facilitator and barrier/lack of hazards, not a priority
70	CA/motivators, facilitator and barrier/Other life situations - not a priority
71	CA/motivators, facilitator and barrier/EM not interesting
72	CA/motivators, facilitator and barrier/Life situation
73	CA/motivators, facilitator and barrier/Other priorities
74	CA/motivators, facilitator and barrier/Reduced resources of people
75	CA/motivators, facilitator and barrier/Limited resources of people (time and efforts)
76	CA/motivators, facilitator and barrier/time constraint - different priorities
77	CA/motivators, facilitator and barrier/benefits more than costs
78	CA/motivators, facilitator and barrier/funding
79	CA/motivators, facilitator and barrier/council support
80	CA/motivators, facilitator and barrier/external leadership and direction

81	CA/motivators, facilitator and barrier/lack of integrated outlook - segregation of EM functions
82	CA/motivators, facilitator and barrier/Reciprocity - relation
83	CA/motivators, facilitator and barrier/Leaders and influencers
84	CA/motivators, facilitator and barrier/Connections
85	CA/motivators, facilitator and barrier/Community champions
86	CA/motivators, facilitator and barrier/forming partnerships
87	CA/motivators, facilitator and barrier/NGOs
88	CA/motivators, facilitator and barrier/connected groups
89	CA/motivators, facilitator and barrier/other groups doing similar things
90	CA/motivators, facilitator and barrier/having a community of practice
91	CA/motivators, facilitator and barrier/access to resources collectively
92	CA/motivators, facilitator and barrier/connections to resources
93	CA/motivators, facilitator and barrier/mutual learning
94	CA/motivators, facilitator and barrier/Spaces of interaction
95	CA/motivators, facilitator and barrier/Transparency
96	CA/motivators, facilitator and barrier/interested in EM
97	CA/motivators, facilitator and barrier/institutional support
98	CA/motivators, facilitator and barrier/bureaucracy
99	CA/motivators, facilitator and barrier/done in partnership
100	CA/motivators, facilitator and barrier/community facilitator's role
101	CA/motivators, facilitator and barrier/community facilitator/skills
102	CA/motivators, facilitator and barrier/community facilitator/representation
103	CA/motivators, facilitator and barrier/community facilitator/contextual understanding
104	CA/motivators, facilitator and barrier/community facilitator/embeddedness
105	CA/motivators, facilitator and barrier/community facilitator/responsive and respectful
106	CA/motivators, facilitator and barrier/"need to work together"
107	CA/motivators, facilitator and barrier/long term residence
108	CA/motivators, facilitator and barrier/intention to stay long
109	CA/motivators, facilitator and barrier/different lived experiences - experience of living with risks or uncertainty
110	CA/motivators, facilitator and barrier/sense of accomplishment
111	CA/motivators, facilitator and barrier/identity related
112	CA/motivators, facilitator and barrier/expectations from a role
113	CA/motivators, facilitator and barrier/sense of frustration with status quo
114	CA/motivators, facilitator and barrier/existing initiatives to piggyback off
115	CA/motivators, facilitator and barrier/Forming role-based groups
116	CA/motivators, facilitator and barrier/comfortable group dynamics
117	CA/motivators, facilitator and barrier/experience of working with each other
118	CA/motivators, facilitator and barrier/comfortable enjoyable activity
119	CA/motivators, facilitator and barrier/mindset
120	CA/motivators, facilitator and barrier/too many things going on
121	CA/motivators, facilitator and barrier/consistency in processes

122	CA/motivators, facilitator and barrier/challenge/transient young people
123	CA/motivators, facilitator and barrier/challenge/perceived as scary
124	CA/motivators, facilitator and barrier/challenge/disaster fatigue
125	Comms/message/content/clear instructions on how to engage, time commitment
126	Comms/message/content/setting clear expectations
127	Comms/message/content/info that reduces access barriers
128	Comms/message/content/provide options to make it easy
129	Comms/message/content/informative
130	Comms/message/content/sufficiency of information
131	Comms/message/content/actionable information
132	Comms/message/content/relatable
133	Comms/message/content/locally applicable information
134	Comms/message/content/info on resources available
135	Comms/message/content/inviting people to join
136	Comms/message/content/knowing neighbours
137	Comms/message/content/build community connections
138	Comms/message/content/benefits of connecting with neighbours, communities
139	Comms/message/content/benefits of mutual helping
140	Comms/message/content/emphasize social connectedness
141	Comms/message/content/encouraging community mindedness in normal times
142	Comms/message/content/ask to join community groups
143	Comms/message/content/help community, each other
144	Comms/message/content/seek help to support others
145	Comms/message/content/promote volunteering
146	Comms/message/content/promote community self help
147	Comms/message/content/caring what people value
148	Comms/message/content/caring what people value/environment
149	Comms/message/content/highlight positive associations with place
150	Comms/message/content/keeping people/place you love safe
151	Comms/message/content/simple everyday actions
152	Comms/message/content/value in simple actions people take
153	Comms/message/content/acknowledging people's contributions
154	Comms/message/content/expressing trust
155	Comms/message/content/shifting idea of who can help
156	Comms/message/content/"not view EM as people with ropes and ladders"
157	Comms/message/content/highlight different ways of helping in EM
158	Comms/message/content/shifting the idea of EM
159	Comms/message/content/from you do this to what can you do
160	Comms/message/content/understanding people's skills and resources
161	Comms/message/content/respecting local knowledge
162	Comms/message/content/acknowledging issues of command and control approach
163	Comms/message/content/sharing lived experiences

164	Comms/message/content/supporting one another
165	Comms/message/content/benefits of engaging
166	Comms/message/content/highlighting benefits over costs
167	Comms/message/content/less dependence on EM
168	Comms/message/content/self-reliance for fast action
169	Comms/message/content/mutual help post events
170	Comms/message/content/get people out of apathy
171	Comms/message/content/shift expectations of government help
172	Comms/message/content/clarify EM responsibility and people's responsibility
173	Comms/message/content/inviting people to bring friends
174	Comms/message/content/social element
175	Comms/message/content/positive outcome expectancy
176	Comms/message/content/self efficacy
177	Comms/message/content/collective efficacy
178	Comms/message/content/giving confidence that people can do it
179	Comms/message/content/making it personal
180	Comms/message/content/giving examples of how others are doing it
181	Comms/message/content/providing ideas on what people can do
182	Comms/message/content/sharing hazard information, experiences
183	Comms/message/content/info on what might happen in an event
184	Comms/message/content/making people think about hazards
185	Comms/message/content/making people think what they can do
186	Comms/message/content/raising awareness of possible actions
187	Comms/message/content/asking people to "step up"
188	Comms/message/content/sense of responsibility
189	Comms/message/content/identity-responsibility
190	Comms/message/content/good citizen-responsibility
191	Comms/message/content/expectations from a good citizen
192	Comms/message/content/self sufficiency need
193	Comms/message/content/appealing to sense of duty
194	Comms/message/content/actions beyond EM that improve preparedness
195	Comms/message/content/continued prompting
196	Comms/message/content/consistent content communicated in varying ways
197	Comms/message/content/"one big team"
198	Comms/message/content/reframing success
199	Comms/message/content/asking people to be part of a positive change
200	Comms/message/content/hypocrisy
201	Comms/message/content/content curated according to the media - social media vs newsletter
202	Comms/message/content/using photos
203	Comms/message/feature/scenario based
204	Comms/message/feature/humour
205	Comms/message/feature/lighten mood

206	Comms/message/feature/stories/experiences
207	Comms/message/feature/conversational
208	Comms/message/feature/informal unstructured
209	Comms/message/feature/vivid
210	Comms/message/feature/generate interest
211	Comms/message/feature/consistent messaging
212	Comms/message/feature/localized messages
213	Comms/message/feature/looks trustworthy
214	Comms/message/feature/care
215	Comms/message/feature/reflects listening
216	Comms/message/feature/messages dependent on facilitators
217	Comms/message/feature/aligned consistent messages
218	Comms/message/feature/visibility
219	Comms/message/feature/information exchange through conversation
220	Comms/message/feature/reflecting people's voice
221	Comms/actor
222	Comms/actor/credible communicator
223	Comms/actor/trusted
224	Comms/actor/being approachable
225	Comms/others/Physical space/Welcoming
226	Comms/others/Physical space/safe familiar space
227	Comms/others/Physical space/people can come and have a conversation
228	Comms/others/Physical space/Create physical proximity
229	Comms/others/resources
230	Comms/others/social infra/presence of groups, community networks etc.
231	Comms/others/connections to comms networks
232	Comms/process/design and strategy
233	Comms/process/techniques - structured workshop, training etc.
234	Comms/process/techniques non interactive - newsletters, mailbox drops etc.
235	Comms/process/techniques - informal presence in events etc.
236	Comms/process/scenario based workshop training
237	Comms/process/communicate through direct source
238	Comms/process/Indirect influence leader
239	Comms/process/Indirect influence interpersonal
240	Comms/process/Contextual understanding/baselining
241	Comms/process/involving local person
242	Comms/process/involving leaders
243	Comms/process/finding leader - community champions
244	Comms/process/involving local person who knows the community
245	Comms/process/involving local person with strengths and skills
246	Comms/process/bringing in people having physical infra
247	Comms/process/right people with right interest

248	Comms/process/people with mandate
249	Comms/process/community buy in
250	Comms/process/having a core group of people
251	Comms/process/Contextual understanding/using different process of engaging
252	Comms/process/cultural consideration
253	Comms/process/Audience segmentation - residents vs holiday homes, young vs old, homeowners vs non homeowners etc
254	Comms/process/one sided vs two sided communication
255	Comms/process/celebration
256	Comms/process/fun
257	Comms/process/icebreaking and informal relations
258	Comms/process/light settings
259	Comms/process/Shoulder tapping
260	Comms/process/ informal conversations
261	Comms/process/Providing paper/printed materials
262	Comms/process/Getting people on mailing list
263	Comms/process/in person
264	Comms/process/in person/face to face
265	Comms/process/in person/one on one
266	Comms/process/in person/meeting leaders influencers and right people in person
267	Comms/process/in person/talking amongst one another
268	Comms/process/in person/personal approach
269	Comms/process/in person/"say hello"
270	Comms/process/in person/chatting to people
271	Comms/process/integration of multiple channels, messages and sources
272	Comms/process/collaboration with existing groups
273	Comms/process/finding partners
274	Comms/process/findings partners to connect with hard to reach groups
275	Comms/process/using existing resources
276	Comms/process/piggybacking off things people are interested in
277	Comms/process/being visible
278	Comms/process/continued presence
279	Comms/process/continued conversation
280	Comms/process/building rapport
281	Comms/process/trust building
282	Comms/process/connections among people
283	Comms/process/spending time in community
284	Comms/process/listening to community conversations
285	Comms/process/communication as process than outcome
286	Comms/process/timing of engagement - pre post event
287	Comms/process/having structure
288	Comms/process/building on personal relations

289	Comms/process/representation in EM team
290	Comms/process/EM personnel as communication channel
291	Comms/process/forming relationships before asking for community support
292	Comms/process/building on people's lived experiences
293	Comms/process/age wise preferences in comms
294	Comms/process/challenges/Lack of events to keep up interest
295	Comms/process/challenges/Lack of awareness about the group's existence
296	Comms/process/challenge/connecting with youth
297	Comms/process/challenge/mobile people
298	Comms/process/unstructured approach
299	Comms/process/social media
300	Comms/process/social media/Important channel/new emerging
301	Comms/process/social media/people connected due to non disaster application
302	Comms/process/social media/popular medium
303	Comms/process/social media/situational awareness
304	Comms/process/social media/easy to inform people what is happening in community
305	Comms/process/social media/one of the channels of communication
306	Comms/process/social media/quick dissemination
307	Comms/process/social media/having trustworthy communicators communicating about EM
308	Comms/process/social media/maintaining conversation around preparedness
309	Comms/process/social media/keep the conversation going
310	Comms/process/social media/two way
311	Comms/process/social media/reminding people in fun way
312	Comms/process/social media/platforms
313	Comms/process/social media/Alternate communication medium when in person comms not working
314	Comms/process/social media/having factual information, not scare mongering
315	Comms/process/social media/presence in social media where community members are
316	Comms/process/social media/build a community of practice
317	Comms/process/social media/build a community of practice/share things, re-use them
318	Comms/process/social media/build a community of practice/convenience
319	Comms/process/social media/using Facebook to inform about preparedness events
320	Comms/process/social media/challenges/not suited for certain communities
321	Comms/process/social media/challenges/having people with skills to manage social media
322	Comms/process/social media/Challenges/not reliable during emergencies
323	Comms/process/social media/Somone from within community communicating on SM
324	Comms/process/social media/knowing the communicator
325	Comms/process/social media/formalization/affiliation of communicator
326	Comms/process/social media/formalization/structure
327	Comms/process/social media/communicator affiliated with civil defence
328	Comms/process/social media/credible communicator

329	Comms/process/social media/value addition in EM comms - e.g. EM and crime communicated together
330	Comms/process/social media/including issues people are concerned about
331	Comms/process/social media/SM as artefact preserving hazard memory
332	Comms/process/social media/monitoring the pages
333	Comms/process/social media/actionable information in messages
334	Comms/process/social media/"good tool but we don't dwell on that too much"
335	Comms/process/emerging tech
336	Comms/process/considerations

Appendix 9 Statement of contributions

DRC 16



GRADUATE
RESEARCH
SCHOOL

STATEMENT OF CONTRIBUTION DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

Name of candidate:	Manomita Das
Name/title of Primary Supervisor:	Julia Becker
In which chapter is the manuscript /published work:	Chapter 4
Please select one of the following three options:	
<input type="radio"/> The manuscript/published work is published or in press <ul style="list-style-type: none"> Please provide the full reference of the Research Output: 	
<input checked="" type="radio"/> The manuscript is currently under review for publication – please indicate: <ul style="list-style-type: none"> The name of the journal: International Journal of Disaster Risk Reduction Article title: Fostering civic participation and collective actions for disaster risk reduction: Insights from Aotearoa New Zealand case studies The percentage of the manuscript/published work that was contributed by the candidate: 95.00 Describe the contribution that the candidate has made to the manuscript/published work: The candidate carried out the literature review, formulated the research question, conducted the data collection and analysis, drafted the manuscript, and incorporated revisions suggested by the journal reviewers, under the guidance of the supervisors. 	
<input type="radio"/> It is intended that the manuscript will be published, but it has not yet been submitted to a journal	
Candidate's Signature:	Manomita Das
Date:	31-Oct-2024
Primary Supervisor's Signature:	Julia Becker
Date:	31-Oct-2024

This form should appear at the end of each thesis chapter/section/appendix submitted as a manuscript/ publication or collected as an appendix at the end of the thesis.

GRS Version 5 – 13 December 2019
DRC 19/09/10



GRADUATE
RESEARCH
SCHOOL

STATEMENT OF CONTRIBUTION DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

Name of candidate:	Manomita Das
Name/title of Primary Supervisor:	Julia Becker
In which chapter is the manuscript /published work:	Chapter 5
Please select one of the following three options:	
<input type="radio"/> The manuscript/published work is published or in press <ul style="list-style-type: none"> • Please provide the full reference of the Research Output: 	
<input checked="" type="radio"/> The manuscript is currently under review for publication – please indicate: <ul style="list-style-type: none"> • The name of the journal: Disasters Article Title: Exploring communication practices that promote community participation and collective action for reducing disaster risks in New Zealand • The percentage of the manuscript/published work that was contributed by the candidate: 95.00 • Describe the contribution that the candidate has made to the manuscript/published work: The candidate carried out the literature review, formulated the research question, conducted the data collection and analysis, drafted the manuscript, and incorporated revisions suggested by the journal reviewers, under the guidance of the supervisors. 	
<input type="radio"/> It is intended that the manuscript will be published, but it has not yet been submitted to a journal	
Candidate's Signature:	
Date:	31-Oct-2024
Primary Supervisor's Signature:	
Date:	31-Oct-2024

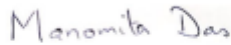
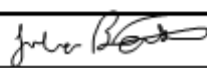
This form should appear at the end of each thesis chapter/section/appendix submitted as a manuscript/ publication or collected as an appendix at the end of the thesis.



GRADUATE
RESEARCH
SCHOOL

STATEMENT OF CONTRIBUTION DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

Name of candidate:	Manomita Das
Name/title of Primary Supervisor:	Julia Becker
In which chapter is the manuscript /published work:	Chapter 6
Please select one of the following three options:	
<input type="radio"/> The manuscript/published work is published or in press <ul style="list-style-type: none"> • Please provide the full reference of the Research Output: 	
<input checked="" type="radio"/> The manuscript is currently under review for publication – please indicate: <ul style="list-style-type: none"> • The name of the journal: International Journal of Disaster Risk Reduction Article Title: 'One big team working together' - Shifting narratives to encourage civic participation and collective action in disaster preparedness • The percentage of the manuscript/published work that was contributed by the candidate: 95.00 • Describe the contribution that the candidate has made to the manuscript/published work: The candidate carried out the literature review, formulated the research question, conducted the data collection and analysis, drafted the manuscript, and incorporated revisions suggested by the journal reviewers, under the guidance of the supervisors. 	
<input type="radio"/> It is intended that the manuscript will be published, but it has not yet been submitted to a journal	
Candidate's Signature:	
Date:	31-Oct-2024
Primary Supervisor's Signature:	
Date:	31-Oct-2024

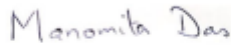

This form should appear at the end of each thesis chapter/section/appendix submitted as a manuscript/ publication or collected as an appendix at the end of the thesis.



GRADUATE
RESEARCH
SCHOOL

STATEMENT OF CONTRIBUTION DOCTORATE WITH PUBLICATIONS/MANUSCRIPTS

We, the candidate and the candidate's Primary Supervisor, certify that all co-authors have consented to their work being included in the thesis and they have accepted the candidate's contribution as indicated below in the *Statement of Originality*.

Name of candidate:	Manomita Das
Name/title of Primary Supervisor:	Julia Becker
In which chapter is the manuscript /published work:	Chapter 7
Please select one of the following three options:	
<input type="radio"/> The manuscript/published work is published or in press <ul style="list-style-type: none"> • Please provide the full reference of the Research Output: 	
<input checked="" type="radio"/> The manuscript is currently under review for publication – please indicate: <ul style="list-style-type: none"> • The name of the journal: Risk Analysis Article Title: Exploring social media functions in the pre-disaster stage: Enhancing preparedness, supporting community actions, and addressing key challenges • The percentage of the manuscript/published work that was contributed by the candidate: 95.00 • Describe the contribution that the candidate has made to the manuscript/published work: The candidate carried out the literature review, formulated the research question, conducted the data collection and analysis, drafted the manuscript, and incorporated revisions suggested by the journal reviewers, under the guidance of the supervisors. 	
<input type="radio"/> It is intended that the manuscript will be published, but it has not yet been submitted to a journal	
Candidate's Signature:	
Date:	31-Oct-2024
Primary Supervisor's Signature:	
Date:	31-Oct-2024

This form should appear at the end of each thesis chapter/section/appendix submitted as a manuscript/ publication or collected as an appendix at the end of the thesis.

Appendix 10 Factors influencing people's participation in collective disaster preparedness in New Zealand - Preliminary data

Background: In recent years, many community groups are engaging with emergency management agencies to reduce disaster risks facing their communities. Members of these community groups often engage in dialogue with emergency managers, voice community concerns and collectively take steps to mitigate hazards and improve preparedness of their communities. However, little is known about why people decide to actively participate in such activities. In this context, I collected interview and survey data to examine the motivations of people to engage in collective actions for disaster preparedness in New Zealand.

However, due to the limited number of survey responses, the findings were not synthesized further to develop a manuscript. The preliminary findings from the qualitative and quantitative analysis are presented below. This was treated as supporting data to understand the study population and their perspectives.

Conceptual framework:

A review of disaster preparedness literature, along with collective action and civic participation studies, was conducted to identify the factors that motivate disaster preparedness and collective actions, respectively. The identified factors were then compared, and the following items were identified as potential drivers of collective actions for disaster preparedness: risk knowledge, hazard awareness, risk perception, locus of control, actionable information, efficacy beliefs, costs and resource availability, positive outcome expectancy, emotion, problem focussed coping, purpose, values & moral, trust, leadership, sense of responsibility, sense of community, place attachment, social identity and norms. The factors are presented in the figure below.

Factors motivating collective actions in disaster preparedness

Disaster preparedness literature

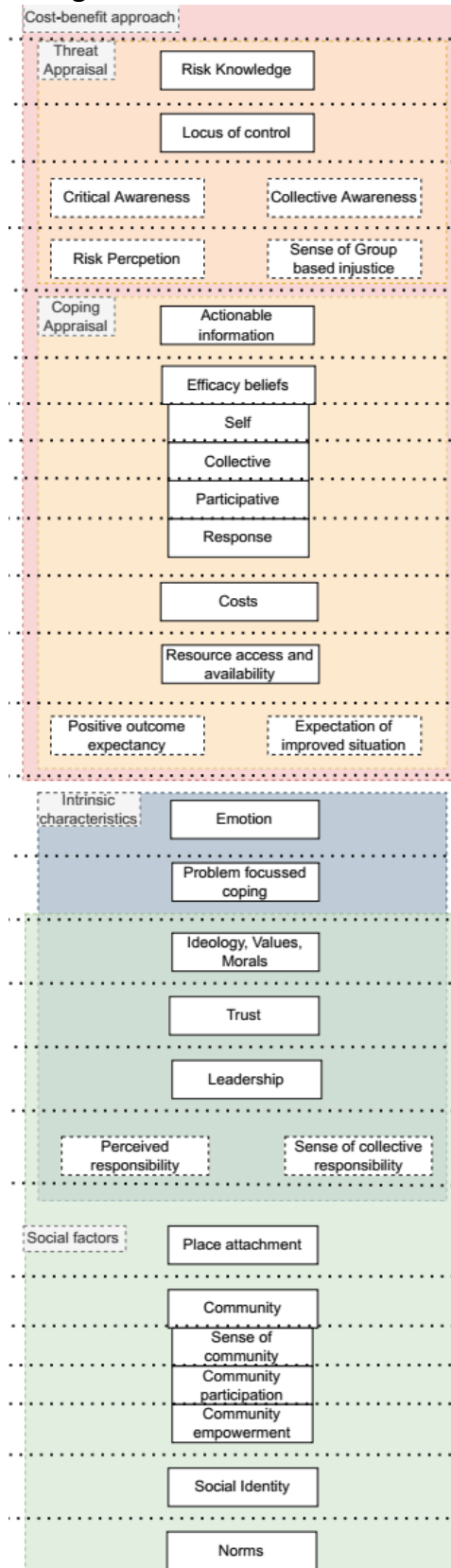
Why people engage in preparedness and mitigation actions?

Guiding Literature:
 Paton and Irons, 2016, Paton, 2007.
 Lindell & Perry, 2012; Rogers, 1975;
 Wood et al., 2012; Solberg et al., 2010,
 Becker et al., 2014, Abunyewah et al.,
 2020, Ajzen et al., 1985

Collective action literature

Why people engage in collective actions?

Guiding Literature:
 Wright, 2009;
 Bamberg et al., 2015, van Zomeren et al., 2008;
 McCarthy & Zald, 1977, Tajfel & Turner, 1979,
 Wright et al., 1990, Klandermans & Oegema, 1987



Research methods: A mixed methods approach was followed. A qualitative multi case design was utilized. Four community groups engaged in collective actions for disaster preparedness – one each from Edgecumbe, Wellington, Arthur’s Pass and Gore - were selected for the study. The groups were selected based on a review of hazard profiles of different regions and initial conversations with emergency management officials, academics and community leaders. Criterion sampling was utilized to recruit participants which included the leaders and volunteers of the four community groups. Between February 2022 and September 2023, thirty-five interviews were conducted following an open-ended interview guide. The interview questions explored why people participated in collective preparedness actions. The interviews were transcribed and loaded in NVivo and thematic analysis was conducted on the interviews. Member checks with participants were conducted to ensure the findings were credible and relevant.

Interviews participants			
<i>Area</i>	<i>Profile</i>	<i>No. of participants</i>	<i>Code</i>
Bay of Plenty	Volunteer in community emergency response team	4	BoP_V1 to BoP_V4
	Emergency management (CDEM) official	1	BoP_EM1
	Official from district council	2	BoP_EM2 & BoP_EM3
	NGO personnel assisting in emergency management	2	BoP_N1 & BoP_N2
Wellington	Volunteer in community group working on emergency management	5	W_V1 to W_V5
	Emergency management (CDEM) official	4	W_EM1 to W_EM4
Canterbury	Volunteer in community emergency response team	8	C_V1 to C_V8
	Emergency management (CDEM) official	1	C_EM1
	Official from district council	1	C_EM2
Southland	Volunteer in community emergency response team	6	S_V1 to S_V6
	Emergency management (CDEM) official	1	S_EM1
	Total		35

Drawing on the literature and the themes derived from the qualitative study, a 36-item self-administered survey questionnaire comprising both multiple choice and free text questions was developed. The factors identified in the conceptual framework were added to the survey questionnaire. Additionally, based on the insights from the qualitative data, efficacy beliefs were split into two questions, self-efficacy and collective efficacy, sense of responsibility was split into two questions covering sense of responsibility for self and for community and risk perception was reframed as self-reliance. The factor social aspect was also added to the survey questionnaire drawing from the qualitative data.

The survey was administered between August and November 2023. The questionnaire is divided into four sections – participant profile (hazard experience, hazard training/education volunteering information, duration of stay in the location) (5 items), self-assessment on a Likert scale of 1 to 5 of influencing factors for collective preparedness (22 items), motivation (1 item), and communication related text response questions (2 items), and demographic details (6 items). Three pilot tests were conducted on the survey.

The survey questionnaires were distributed in both hardcopy format and as an online link to the survey hosted on the Qualtrics platform. I sought participants who were community members from the study areas (Bay of Plenty, Wellington, Canterbury and Southland) and who participate or volunteer in collective actions for reducing disaster risks at the community level. Snowball sampling was employed, where the surveys were shared with emergency management officials, community-based organization representatives and community members from the study areas, who were then asked to share it with other people engaging in collective actions. In total, 80 participants completed the survey. Due to the limited number of responses to the survey, we used descriptive statistics, mainly mean and standard deviation to describe the results derived from the survey data (Cooksey, 2020).

Participant profile (n = 80)	
<i>Gender</i>	
Male	41
Female	37
Undisclosed	2
<i>Age</i>	
18 to 30	3
31 to 45	9
46 to 60	27
60 to 75	37
Above 75	4
<i>Location</i>	
Bay of Plenty	3
Wellington	21
Canterbury	51
Southland	5

Table: Demographic profile of survey participants

Findings:

Qualitative findings – Preliminary insights

- Across the community groups ideology and values were important motivators for people to participate in collective actions for DRR. Values associated with being a “good human”, stemming from humanitarianism or a national or religious identity featured most prominently during the discussions.
- Sense of responsibility was another factor captured in the data:

“knowing we have so much social housing around here, I'm fairly much of the opinion that the people living in those small apartments... you know they are pushing them to do these things (referring to prescribed individual preparedness action), but they have got lots of issues ...they can't have much water in their apartments. So, I feel like the rest of us have to be a bit more prepared so that if there's a massive earthquake and we might have to help them.”

The above statement highlights a sense of responsibility emerging from the identity of being a community member. Sense of responsibility can also arise from one's identity in their occupation:

“They tell us there is going to be big earthquake...just my role as a teacher at the school, making sure that we have our own emergency kits at school, so you know if there was an emergency like that a major earthquake that we (can) look after the children for a length of time, so.”

It is noteworthy that risk perception is closely linked to the sense of responsibility. Sense of responsibility alone may not be adequate to motivate actions, rather perception of risk towards the group that someone is feeling responsible for motivates collective action. For example, a higher risk perception of people living in social housing and of school children were the motivators in the above two cases.

- While place attachment was another motivator, a big predictor of whether people wanted to engage in collective action was whether they had intentions of residing in the place for a long time, irrespective of how long they have already stayed in the place.
- Having trusted leadership added to people's intentions of participating in collective actions.
- “Knowing people” is another factor that motivated people to participate in collective actions. For people who have newly moved into an area, the motivation to engage in collective actions was often to know people and connect with their neighbours

“My motivation when I started out then was to have some sort of a community here... I was acutely aware that there were no sort of neighbourhood groups here...It's just so much nicer knowing people around, than living somewhere where you don't know anyone. So when Andy decided he didn't want to write the electronic communications anymore, I started to pick that up... the thing that interested me the most was seizing upon that opportunity and making it grow.”

For people who are already a part of the community, spending time with people they already know and doing something meaningful was worthwhile.

“There's always interesting things we hear about (in the meetings). The meetings some reason there's always stuff happening around here...people enjoy just being a part of the place you know and also knowing each other.”

Also, it gave the participants the confidence that working together will not be difficult “because you know each other, you can work together”.

- Aligning with previous literature, the study finds that people who engaged in collective actions for DRR were often the ones who engaged in other voluntary and community actions as well.

Quantitative findings – Descriptive analysis

<i>Factors</i>	Strongly agree (5)	Agree (4)	Neither agree nor disagree (3)	Disagree (2)	Strongly disagree (1)	Mean	Std. dev
Hazard awareness	71	9	0	0	0	4.8875	0.315981
Locus of control	31	38	11	0	0	4.25	0.680074
Self-reliance	76	4	0	0	0	4.95	0.217945
Actionable information	61	19	0	0	0	4.7625	0.425551
Self efficacy	46	30	4	0	0	4.525	0.59108
Collective efficacy	45	31	4	0	0	4.5125	0.591476
Costs, Resource availability	20	45	15	0	0	4.0625	0.658478
Positive outcome expectancy	63	17	0	0	0	4.7875	0.409077
Emotion	25	20	35	0	0	3.875	0.856957
Problem focussed coping	43	29	6	0	2	4.3875	0.829062
Sense of purpose	66	12	2	0	0	4.8	0.458258
Values and morals	67	13	0	0	0	4.8375	0.368909
Trust	50	26	4	0	0	4.575	0.586835
Leadership	52	22	6	0	0	4.575	0.627993
Sense of responsibility for self	63	15	2	0	0	4.7625	0.480722
Sense of responsibility for community	19	45	16	0	0	4.0375	0.660374
Sense of community	41	28	11	0	0	4.375	0.713705
Social identity	27	46	7	0	0	4.25	0.60208
Sense of reciprocity	29	16	19	0	16	3.525	1.474576
Norms	4	18	29	0	29	2.6	1.30958
Social aspect	47	24	9	0	0	4.475	0.688749

The survey results show that self-reliance, values and morals and sense of purpose have high means and low standard deviations indicating strong and consistent agreement among participants. In contrast norms and sense of reciprocity received low means and high standard deviation suggesting lower levels of agreement and divergent opinions among participants. Overall, most factors received

a mean higher than 4, which shows that participants agreed on most factors identified in the framework.

Insights from qualitative and quantitative data: The findings on values and morals are consistent with the qualitative data where values emerged as a theme. On the other hand, while sense of responsibility both for self and community and place attachment emerged as important themes in the qualitative data, the quantitative data indicates weaker agreement on these factors. The findings largely align with previous studies with the exception of the findings on norms and sense of reciprocity which received lower consensus.

Concluding remarks: The qualitative and quantitative data presented above provides insights on the factors motivating people to engage in collective actions for disaster preparedness in New Zealand. However, as mentioned previously, due to the limited number of survey responses, further analysis of the data was not conducted. I intend to pursue this question in future research, particularly to explore factors such as norms, sense of reciprocity and emotions further, aiming to better understand the differences in perspectives.

References

- A. Johnson, V., R. Ronan, K., M. Johnston, D., & Peace, R. (2014). Implementing disaster preparedness education in New Zealand primary schools. *DISASTER PREVENTION AND MANAGEMENT*, 23(4), 370-380.
- Abunyewah, M., Gajendran, T., Maund, K., & Okyere, S. A. (2020). Strengthening the information deficit model for disaster preparedness: Mediating and moderating effects of community participation. *International Journal of Disaster Risk Reduction*, 46, 101492.
- Adams, R. M., Karlin, B., Eisenman, D. P., Blakley, J., & Glik, D. (2017). Who participates in the Great ShakeOut? Why audience segmentation is the future of disaster preparedness campaigns. *International Journal of Environmental Research and Public Health*, 14(11), 1407.
- Adu Gyamfi, B., & Shaw, R. (2022). The impact of COVID-19 pandemic on public engagement approaches to disaster preparedness for foreign residents: Case of Tokyo Metropolitan Area, Japan. *International Journal of Disaster Resilience in the Built Environment*, 13(3), 269-285.
- Agostini, M., & van Zomeren, M. (2021). Toward a Comprehensive and Potentially Cross-Cultural Model of Why People Engage in Collective Action: A Quantitative Research Synthesis of Four Motivations and Structural Constraints [Article]. *Psychological Bulletin*, 147(7), 667-700. <https://doi.org/10.1037/bul0000256>
- Agrawal, S., Ambury, H., Parida, D., & Joshi, N. (2022). Understanding risk communication in practice: Insights from municipalities in Alberta, Canada. *International journal of disaster risk reduction*, 79, 103175.
- Ajzen, I., Kuhl, J., & Beckmann, J. (1985). Action control: From cognition to behavior. *From intentions to actions: A theory of planned behavior*, 11-39.
- Akama, Y., & Ivanka, T. (2010). What community? Facilitating awareness of 'community' through Playful Triggers. Proceedings of the 11th biennial participatory design conference,
- Aldrich, D. P. (2017). The importance of social capital in building community resilience. *Rethinking resilience, adaptation and transformation in a time of change*, 357-364.
- Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American Behavioral Scientist*, 59(2), 254-269.
- Alexander, D. E. (2014). Social media in disaster risk reduction and crisis management. *Science and Engineering Ethics*, 20, 717-733.
- Amore, A., Michael Hall, C., & Jenkins, J. (2017). They never said 'Come here and let's talk about it': Exclusion and non-decision-making in the rebuild of Christchurch, New Zealand. *Local Economy*, 32(7), 617-639.
- Andrade, E. L., Barrett, N. D., Edberg, M. C., Rivera, M. I., Latinovic, L., Seeger, M. W., Goldman-Hawes, A., & Santos-Burgoa, C. (2020). Mortality reporting and rumor generation: An assessment of crisis and emergency risk communication following. *Journal of International Crisis and Risk Communication Research*, 3(1), 15-47.

- Andrew, S. A., Bacot, H., & Craw, M. (2020). A multiorganizational cooperation framework for neighborhood disaster resilience. *State and Local Government Review*, 52(1), 53-66.
- Andrews, R., Graham, J., Sutherland, J., Cracknell, T., & Heke, M. (2015). Te Hīkoi a Rūaumoko - Rūaumoko's Walk. <https://www.aucklandemergencymanagement.org.nz/media/1106/ruaumokos-walk-a4-low-res.pdf>
- Anfara Jr, V. A., & Mertz, N. T. (2014). *Theoretical frameworks in qualitative research*. Sage publications.
- Anikeeva, O., Steenkamp, M., & Arbon, P. (2016). The future of social media use during emergencies in Australia: Insights from the 2014 Australian and New Zealand disaster and emergency management conference social media workshop. In *Effective Communication During Disasters* (pp. 151-162). Apple Academic Press.
- Arnstein, S. R. (1969). A ladder of citizen participation. *Journal of the American Institute of planners*, 35(4), 216-224.
- Arnstein, S. R. (2019). A ladder of citizen participation. *Journal of the American Planning Association*, 85(1), 24-34.
- Arroyo, I., & Åstrand, J. (2019). Housing recovery outcomes after typhoon Haiyan in the Philippines: a critical realist perspective. *Journal of Critical Realism*, 18(2), 142-168.
- Asharose, Saizen, I., & Chakkalathundiyl Sasi, P. K. (2015). Awareness workshop as an effective tool and approach for education in disaster risk reduction: A case study from Tamil Nadu, India. *Sustainability*, 7(7), 8965-8984.
- Atkin, C. K., & Salmon, C. (2013). The SAGE handbook of persuasion: Developments in theory and practice. In: Sage.
- Atkinson, P. (2007). *Ethnography: Principles in practice*. Routledge.
- Auckland Emergency Management. (2024). Working together to build a Resilient Auckland | Auckland Emergency Management. In.
- Auliagisni, W., Wilkinson, S., & Elkharboutly, M. (2022). Using community-based flood maps to explain flood hazards in Northland, New Zealand [Article]. *Progress in Disaster Science*, 14, Article 100229. <https://doi.org/10.1016/j.pdisas.2022.100229>
- Austin, L., Fisher Liu, B., & Jin, Y. (2012). How audiences seek out crisis information: Exploring the social-mediated crisis communication model. *Journal of Applied Communication Research*, 40(2), 188-207.
- Baesler, E. J. (1995). Construction and test of an empirical measure for narrative coherence and fidelity. *Communication Reports*, 8(2), 97-101.
- Bailey, J., & Mahutonga, N. (2021). Designing tsunami risk communication with communities: a site-specific case study from Turanganui-a-Kiwa, Aotearoa Ne w Zealand. *Australas. J. Disaster Trauma Stud*, 25(1).

- Baker, N. D., & Grant Ludwig, L. (2018). Disaster preparedness as social control. *Critical Policy Studies*, 12(1), 24-43.
- Balog-Way, D., McComas, K., & Besley, J. (2020). The evolving field of risk communication. *Risk analysis*, 40(S1), 2240-2262.
- Bamberg, S., Rees, J., & Seebauer, S. (2015). Collective climate action: Determinants of participation intention in community-based pro-environmental initiatives. *Journal of Environmental Psychology*, 43, 155-165.
- Bandura, A. (1969). Social-learning theory of identificatory processes. *Handbook of socialization theory and research*, 213, 262.
- Bandura, A. (1995). Exercise of personal and collective efficacy in changing societies. *Self-efficacy in changing societies*, 15, 334.
- Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Englewood cliffs Prentice Hall.
- Baranowski, T., Buday, R., Thompson, D. I., & Baranowski, J. (2008). Playing for real: video games and stories for health-related behavior change. *American journal of preventive medicine*, 34(1), 74-82. e10.
- Barrett, M., & Brunton-Smith, I. (2017). Political and civic engagement and participation: Towards an integrative perspective. In *Framing Civic Engagement, Political Participation and Active Citizenship in Europe* (pp. 5-28). Routledge.
- Basak, J., Bhaumik, P., Roy, S., & Bandyopadhyay, S. (2020). A Crowdsourcing based information system framework for coordinated disaster management and building community resilience. Proceedings of the 21st International Conference on Distributed Computing and Networking,
- Baudoin, M.-A., Henly-Shepard, S., Fernando, N., Sitati, A., & Zommers, Z. (2016). From top-down to "community-centric" approaches to early warning systems: Exploring pathways to improve disaster risk reduction through community participation. *International Journal of Disaster Risk Science*, 7, 163-174.
- Bazeley, P. (2020). Qualitative data analysis: Practical strategies. *Qualitative Data Analysis*, 1-584.
- Beaulieu, N., Santos Silva, J., & Plante, S. (2016). Using a vision of a desired future in climate change adaptation planning: lessons learned in the municipality of Rivière-au-Tonnerre (Québec, Canada). *Climate and Development*, 8(5), 447-457.
- Beck, U. (2000). Chapter 12: Risk Society Revisited: Theory, Politics and Research Programmes. In B. Adam, U. Beck, & J. v. Loon (Eds.), *The Risk Society and Beyond: Critical Issues for Social Theory* (pp. 1 - 14). SAGE Publications Ltd.
- Becker, J., Coomer, M., Potter, S., McBride, S., Lambie, E., Johnston, D., Cheesman, B., Guard, J., & Walker, A. (2016). Evaluating New Zealand's "ShakeOut" national earthquake drills: A comparative analysis of the 2012 and 2015 events. Proceedings of the 2016 NZSEE Conference, Christchurch, New Zealand,
- Becker, J., Johnston, D., Paton, D., & Ronan, K. (2012). How people use earthquake information and its influence on household preparedness in New Zealand.

- Becker, J. S., Blake, D., Thompson, J., Vinnell, L. J., & Doyle, E. E. (2023). Communicating evacuation information to multi-storey apartment dwellers: a case study of the 2016 Kaikōura earthquake in Te Whanganui-a-Tara (Wellington), Aotearoa New Zealand. *New Zealand Journal of Geology and Geophysics*, 66(2), 177-191.
- Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (2012). A model of household preparedness for earthquakes: how individuals make meaning of earthquake information and how this influences preparedness. *Natural Hazards*, 64, 107-137.
- Becker, J. S., Paton, D., Johnston, D. M., & Ronan, K. R. (2013). Salient beliefs about earthquake hazards and household preparedness. *Risk analysis*, 33(9), 1710-1727.
- Becker, J. S., Paton, D., Johnston, D. M., Ronan, K. R., & McClure, J. (2017). The role of prior experience in informing and motivating earthquake preparedness. *International Journal of Disaster Risk Reduction*, 22, 179-193.
- Becker, J. S., Paton, D., & McBride, S. (2013). *Improving community resilience in the Hawke's Bay: A review of resilience research, and current public education, communication and resilience strategies*. GNS Science Lower Hutt, New Zealand.
- Becker, J. S., Potter, S. H., McBride, S., Wein, A., Doyle, E., & Paton, D. (2019). When the earth doesn't stop shaking: How experiences over time influenced information needs, communication, and interpretation of aftershock information during the Canterbury Earthquake Sequence, New Zealand. *International Journal of Disaster Risk Reduction*, 34, 397-411.
- Bell, K. (2010). Cancer survivorship, mortality and lifestyle discourses on cancer prevention. *Sociology of health & illness*, 32(3), 349-364.
- Benn, J. (2005). Landslide events on the west coast, South Island, 1867–2002. *New Zealand Geographer*, 61(1), 3-13.
- Bennett, D. (2014). How do emergency managers use social media platforms? *Journal of Emergency Management (Weston, Mass.)*, 12(3), 251-256.
- Benson, C., Twigg, J., & Myers, M. (2001). NGO initiatives in risk reduction: an overview. *Disasters*, 25(3), 199-215.
- Bera, M. K. (2019). Collective efforts of people to reduce disasters in the Indian Sundarban islands. *Disaster Prevention and Management: An International Journal*.
- Berah, E., Jones, H., & Valent, P. (1984). The experience of a mental health team involved in the early phase of a disaster. *Australian and New Zealand Journal of Psychiatry*, 18(4), 354-358.
- Berkes, F., & Ross, H. (2013). Community resilience: toward an integrated approach. *Society & natural resources*, 26(1), 5-20.
- Berlo, D. K. (1960). *The Process of Communication: An Introduction to Theory and Practice* (New York: Holt, Rinehart and Winston, 1960), 14.
- Bessette, G. (2004). *Involving the community: A guide to participatory development communication*. Idrc.

- Bhuvana, N., & Aram, I. A. (2019). Facebook and Whatsapp as disaster management tools during the Chennai (India) floods of 2015. *International journal of disaster risk reduction*, 39, 101135.
- Biesta, G. (2010). Pragmatism and the Philosophical Foundations of Mixed Methods Research. In Abbas Tashakkori & C. Teddlie (Eds.), *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. SAGE Publications, Inc.
- Bihari, M., & Ryan, R. (2012). Influence of social capital on community preparedness for wildfires. *Landscape and urban planning*, 106(3), 253-261.
- Birks, M., Chapman, Y., & Francis, K. (2008). Memoing in qualitative research: Probing data and processes. *Journal of research in nursing*, 13(1), 68-75.
- Blackett, P., & Hume, T. (2007). Community involvement in coastal hazard mitigation: Some insights into process and pitfalls. Paper disampaikan dalam seminar Politics of Planning Conference 2007,
- Blaikie, P., Cannon, T., Davis, I., & Wisner, B. (2014). *At risk: natural hazards, people's vulnerability and disasters*. Routledge.
- Blair, J., Czaja, R. F., & Blair, E. A. (2013). *Designing surveys: A guide to decisions and procedures*. sage publications.
- Blake, D., Hodgetts, D., Thompson, J., & Johnston, D. (2022). Mataura flood 2020, Aotearoa New Zealand: A case study highlighting resilience through community spirit [Article]. *International Journal of Disaster Risk Reduction*, 82, Article 103347. <https://doi.org/10.1016/j.ijdrr.2022.103347>
- Blake, D., Marlowe, J., & Johnston, D. (2017). Get prepared: Discourse for the privileged? *International Journal of Disaster Risk Reduction*, 25, 283-288.
- Blumer, H. (1986). *Symbolic interactionism: Perspective and method*. Univ of California Press.
- Boafo, K. S. (2006). Participatory development communication: an African perspective. *People, land and water: Participatory development communication for natural resource management*, 41-48.
- Bogdan, E. E. A., Roszko, A. M., Beckie, M. A., & Conway, A. (2021). We're ready! Effectiveness of community disaster preparedness workshops across different community groups in Alberta, Canada. *International journal of disaster risk reduction*, 55, 102060.
- Bohensky, E. L., & Maru, Y. (2011). Indigenous knowledge, science, and resilience: What have we learned from a decade of international literature on "integration"? *Ecology and Society*, 16(4).
- Bonaiuto, M., Alves, S., De Dominicis, S., & Petruccelli, I. (2016). Place attachment and natural hazard risk: Research review and agenda. *Journal of Environmental Psychology*, 48, 33-53.
- Bonniface, L., & Henley, N. (2008). 'A drop in the bucket ': Collective efficacy perceptions and environmental behaviour. *Australian Journal of Social Issues*, 43(3), 345-358.
- Borman, K. M., Clarke, C., Cotner, B., & Lee, R. (2012). Cross-case analysis. In *Handbook of complementary methods in education research* (pp. 123-139). Routledge.

- Bourdaa, M. (2014). This is not marketing. This is HBO: Branding HBO with transmedia storytelling. *Networking Knowledge: Journal of the MeCCSA Postgraduate Network*, 7(1).
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative research journal*.
- Braddock, K., & Dillard, J. P. (2016). Meta-analytic evidence for the persuasive effect of narratives on beliefs, attitudes, intentions, and behaviors. *Communication Monographs*, 83(4), 446-467.
- Bradford, R., & O'Sullivan, J. (2011). Improving communication strategies for effective flood risk management. National Hydrology Conference,
- Bradley, D. T., McFarland, M., & Clarke, M. (2016). The effectiveness of disaster risk communication: a systematic review of intervention studies. *Effective Communication During Disasters*, 81-120.
- Braun, V., & Clarke, V. (2012). *Thematic analysis*. American Psychological Association.
- Bray, A. C., Orchiston, C. H., & Shrestha, S. R. (2023). Using photovoice for disaster and hazard preparedness: A methodological review. *International Journal of Disaster Risk Reduction*, 103742.
- Breakwell, G. M. (2000). Risk communication: factors affecting impact. *British medical bulletin*, 56(1), 110-120.
- Brennan, M. A., & Flint, C. G. (2007). Uncovering the hidden dimensions of rural disaster mitigation: Capacity building through community emergency response teams. *Journal of Rural Social Sciences*, 22(2), 7.
- Britton, N. R., & Clark, G. J. (2000). From response to resilience: emergency management reform in New Zealand. *Natural Hazards Review*, 1(3), 145-150.
- Broad, G. M., Ball-Rokeach, S. J., Ognyanova, K., Stokes, B., Picasso, T., & Villanueva, G. (2013). Understanding communication ecologies to bridge communication research and community action. *Journal of Applied Communication Research*, 41(4), 325-345.
- Bronen, R., Pollock, D., Overbeck, J., Stevens, D., Natali, S., & Maio, C. (2020). Usteq: integrating indigenous knowledge and social and physical sciences to coproduce knowledge and support community-based adaptation. *Polar Geography*, 43(2-3), 188-205.
- Brown, N. A., Campbell, E., Johnstoni, D., McCracken, H., Bradley, S., Dray, S., & Neely, D. (2019). Wellington Resilience workshop: Creating shared ideas and meanings. *Australasian Journal of Disaster and Trauma Studies*, 23(2), 101-111.
- Bryman, A. (2006). Integrating quantitative and qualitative research: how is it done? *Qualitative research*, 6(1), 97-113.
- Bryman, A. (2016). *Social research methods*. Oxford university press.
- Bryner, V., Norris, R., & Fleming, J. S. (n.d.). The Greater Christchurch earthquakes of 2010 and 2011: a case study in the communication of science for disaster risk reduction.
- Buchtman, M., Wise, R., O'Connell, D., Crosweller, M., & Edwards, J. (2023). Reforming Australia's approach to hazards and disaster risk: national leadership, systems thinking, and inclusive

- conversations about vulnerability. *Disaster Prevention and Management: An International Journal*, 32(1), 49-73.
- Burnside-Lawry, J., Akama, Y., & Rogers, P. (2013). Communication research needs for building societal disaster resilience. *Australian Journal of Emergency Management*, 28(4), 29-35.
- Buzzanell, P. M. (2010). Resilience: Talking, resisting, and imagining new normalcies into being. *Journal of Communication*, 60(1), 1-14.
- Buzzelli, M. M., Morgan, P., Muschek, A. G., & Macgregor-Skinner, G. (2014). Information and communication technology: Connecting the public and first responders during disasters. *J Emerg Manag*, 12(6), 441-447.
- Cadag, J. R. D., & Gaillard, J.-C. (2012). Integrating knowledge and actions in disaster risk reduction: the contribution of participatory mapping. *Area*, 44(1), 100-109.
- Canadas, M. J., Novais, A., & Marques, M. (2016). Wildfires, forest management and landowners' collective action: A comparative approach at the local level. *Land Use Policy*, 56, 179-188.
- Cardinal, C., Davis, P., Scarbrough, A., Martinez, J., & Ratnapradipa, D. (2021). Communication strategies to facilitate emergency preparedness for Generation Z and college food pantries: Lessons from the COVID-19 pandemic. *Journal of Emergency Management*, 19(7), 99-107.
- Carlin, P. S., & Park-Fuller, L. M. (2012). Disaster narrative emergent/cies: Performing loss, identity and resistance. *Text and Performance Quarterly*, 32(1), 20-37.
- Carlton, S., & Vallance, S. (2013). An inventory of community-led and non-governmental organisations and initiatives in post-earthquake Canterbury.
- Carpini, M. D. (2004). Mediating democratic engagement: The impact of communications on citizens' involvement in political and civic life. *Handbook of political communication research*, 357-394.
- Carr, J., & Jensen, J. (2015). Explaining the pre-disaster integration of community emergency response teams (CERTs). *Natural Hazards*, 77, 1551-1571.
- Carter, L. H., & Kenney, C. M. (2018). A tale of two communities: B-race-ing disaster responses in the media following the Canterbury and Kaikōura earthquakes. *International Journal of Disaster Risk Reduction*, 28, 731-738.
- Caswell, D., & Dörr, K. (2018). Automated Journalism 2.0: Event-driven narratives: From simple descriptions to real stories. *Journalism practice*, 12(4), 477-496.
- Cavallo, A. (2014). Integrating disaster preparedness and resilience: a complex approach using System of Systems. *Australian Journal of Emergency Management, The*, 29(3), 46-51.
- Ceusters, W., Capolupo, M., De Moor, G., & Devlies, J. (2008). Introducing realist ontology for the representation of adverse events. Formal ontology in information systems,
- Chambers, R. (1994). The origins and practice of participatory rural appraisal. *World Development*, 22(7), 953-969.
- Chamlee-Wright, E., & Storr, V. H. (2011). Social capital as collective narratives and post-disaster community recovery. *The sociological review*, 59(2), 266-282.

- Chandra, A., Acosta, J., Howard, S., Uscher-Pines, L., Williams, M., Yeung, D., Garnett, J., & Meredith, L. S. (2011). Building community resilience to disasters: A way forward to enhance national health security. *Rand health quarterly*, 1(1).
- Chari, R., Petrun Sayers, E. L., Amiri, S., Leinhos, M., Kotzias, V., Madrigano, J., Thomas, E. V., Carbone, E. G., & Uscher-Pines, L. (2019). Enhancing community preparedness: an inventory and analysis of disaster citizen science activities. *BMC public health*, 19, 1-15.
- Charmaz, K. (2008). Reconstructing grounded theory. *The SAGE handbook of social research methods*, 461-478.
- Charnley, S., Kelly, E. C., & Fischer, A. P. (2020). Fostering collective action to reduce wildfire risk across property boundaries in the American West. *Environmental Research Letters*, 15(2), 025007.
- Cherryholmes, C. H. (1992). Notes on pragmatism and scientific realism. *Educational researcher*, 21(6), 13-17.
- Chipangura, P., Van Niekerk, D., & Van Der Waldt, G. (2016). An exploration of objectivism and social constructivism within the context of disaster risk. *DISASTER PREVENTION AND MANAGEMENT*, 25(2), 261-274.
- Chou, J.-S., & Wu, J.-H. (2014). Success factors of enhanced disaster resilience in urban community. *Natural hazards*, 74, 661-686.
- Chung, J. (2016). Conflicts and natural disaster management: a comparative study of flood control in the Republic of Korea and the United States. *Disasters*, 40(3), 554-572.
- Civil Defence Emergency Management Canterbury. (2024). *Community ready*. <https://www.cdemcanterbury.govt.nz/community-ready/> ,
- Clark, V. L. P., & Creswell, J. W. (2008). *The mixed methods reader*. Sage.
- Clive, M. A. T., Lindsay, J. M., Leonard, G. S., Lutteroth, C., Bostrom, A., & Corballis, P. (2021). Volcanic hazard map visualisation affects cognition and crisis decision-making. *International Journal of Disaster Risk Reduction*, 55, 102102.
- Cnaan, R. A., & Park, S. (2016). The multifaceted nature of civic participation: A literature review. *Voluntaristics Review*, 1(1), 1-73.
- Coles, E., & Buckle, P. (2004). Developing community resilience as a foundation for effective disaster recovery. *Australian Journal of Emergency Management*, The, 19(4), 6-15.
- Colle, R. D. (2008). Threads of development communication. *Communication for development and social change*, 96-157.
- Comfort, L., Wisner, B., Cutter, S., Pulwarty, R., Hewitt, K., Oliver-Smith, A., Wiener, J., Fordham, M., Peacock, W., & Krimgold, F. (1999). Reframing disaster policy: the global evolution of vulnerable communities. *Global Environmental Change Part B: Environmental Hazards*, 1(1), 39-44.
- Comfort, L. K. (2016). Building community resilience to hazards. In (Vol. 90, pp. 1-4): Elsevier.

- Conrad, C. C., & Hilchey, K. G. (2011). A review of citizen science and community-based environmental monitoring: issues and opportunities. *Environmental monitoring and assessment*, 176, 273-291.
- Cook, H., Benson, D., Inman, A., Jordan, A., & Smith, L. (2012). Catchment management groups in England and Wales: extent, roles and influences. *Water and Environment Journal*, 26(1), 47-55.
- Cooksey, R. W. (2020). Descriptive statistics for summarising data. In *Illustrating statistical procedures: Finding meaning in quantitative data* (pp. 61-139). Springer.
- Cool, C. T., Claravall, M. C., Hall, J. L., Taketani, K., Zepeda, J. P., Gehner, M., & Lawe-Davies, O. (2015). Social media as a risk communication tool following Typhoon Haiyan. *Western Pacific surveillance and response journal: WPSAR*, 6(Suppl 1), 86.
- Coombs, W. T., & Holladay, S. J. (2002). Helping crisis managers protect reputational assets: Initial tests of the situational crisis communication theory. *Management Communication Quarterly*, 16(2), 165-186.
- Cornwall, A., & Jewkes, R. (1995). What is participatory research? *Social Science & Medicine*, 41(12), 1667-1676.
- Covello, V. T., Slovic, P., & Von Winterfeldt, D. (1986). Risk communication: A review of the literature.
- Craig, R. T. (1999). Communication theory as a field. *Communication theory*, 9(2), 119-161.
- Crawford, S. (2009). Maturanga Maori and western science: The importance of hypotheses, predictions and protocols.
- Cresswell, J. (2013). Qualitative inquiry & research design: Choosing among five approaches. In.
- Cresswell, J. W. (2007). Qualitative inquiry and research design: Choosing among five approaches. *Lincoln: Sage Publications*.
- Cresswell, J. W. (2009). Qualitative procedures. *Research design: Qualitative, quantitative, and mixed methods approaches*, 2, 173-201.
- Cresswell, J. W. (2014). *A concise introduction to mixed methods research*. SAGE publications.
- Cresswell, J. W., & Clark, V. L. P. (2017). Chapter 2 The Foundations of Mixed Methods Research. In J. W. Creswell & V. L. P. Clark (Eds.), *Designing and conducting mixed methods research*. Sage publications.
- Cresswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into practice*, 39(3), 124-130.
- Cresswell, J. W., & Plano Clark, V., eds. (2018). Core mixed methods designs. *Designing and conducting mixed methods research*, 3, 51-99.
- Cresswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.
- Cretney, R. M. (2018). Beyond public meetings: Diverse forms of community led recovery following disaster. *International Journal of Disaster Risk Reduction*, 28, 122-130.

- Crimp, L. (2024). Earthquake disaster risk from NZ's Hikurangi subduction zone laid bare. *RNZ*. <https://www.newshub.co.nz/home/new-zealand/2024/05/it-could-happen-tomorrow-huge-quake-dangers-from-our-biggest-fault.html>
- Cronin, S. J., Gaylord, D. R., Charley, D., Alloway, B. V., Wallez, S., & Esau, J. W. (2004). Participatory methods of incorporating scientific with traditional knowledge for volcanic hazard management on Ambae Island, Vanuatu. *Bulletin of volcanology*, *66*, 652-668.
- Cronin, S. J., Petterson, M. G., Taylor, P. W., & Biliki, R. (2004). Maximising multi-stakeholder participation in government and community volcanic hazard management programs; a case study from Savo, Solomon Islands. *Natural hazards*, *33*(1), 105.
- Crowe, S., Cresswell, K., Robertson, A., Huby, G., Avery, A., & Sheikh, A. (2011). The case study approach. *BMC medical research methodology*, *11*(1), 1-9.
- Cuatón, G. P., & Su, Y. (2020). Local-indigenous knowledge on disaster risk reduction: Insights from the Mamanwa indigenous peoples in Basey, Samar after Typhoon Haiyan in the Philippines. *International Journal of Disaster Risk Reduction*, *48*, 101596.
- Cullen, R. (2001). Addressing the digital divide. *Online Information Review*, *25*(5), 311-320.
- Curato, N., & Calamba, S. J. (2020). Surviving disasters by suppressing political storms: Participation as knowledge transfer in community-based disaster governance. *Critical Sociology*, *46*(2), 241-256.
- Curtis, A., Ross, H., Marshall, G. R., Baldwin, C., Cavaye, J., Freeman, C., Carr, A., & Syme, G. J. (2014). The great experiment with devolved NRM governance: lessons from community engagement in Australia and New Zealand since the 1980s. *Australasian Journal of Environmental Management*, *21*(2), 175-199.
- Cutter, S. L. (2016). The landscape of disaster resilience indicators in the USA. *Natural Hazards*, *80*(2), 741-758.
- Dagron, A. G. (2009). Playing with fire: Power, participation, and communication for development. *Development in practice*, *19*(4-5), 453-465.
- Dahlstrom, M. F. (2014). Using narratives and storytelling to communicate science with nonexpert audiences. *Proceedings of the national academy of sciences*, *111*(supplement_4), 13614-13620.
- Dahlstrom, M. F., & Ho, S. S. (2012). Ethical considerations of using narrative to communicate science. *Science Communication*, *34*(5), 592-617.
- Damtew, E., Leeuwis, C., Struik, P. C., Cecchi, F., van Mierlo, B., Lie, R., Lemaga, B., & Cieslik, K. (2021). Communicative interventions for collective action in the management of potato late blight: evidence from a framed field game experiment in Ethiopia. *Food Security*, *13*(2), 255-271.
- Dargin, J. S., Fan, C., & Mostafavi, A. (2021). Vulnerable populations and social media use in disasters: Uncovering the digital divide in three major US hurricanes. *International journal of disaster risk reduction*, *54*, 102043.

- Dasgupta, S. (2019). Participation as a health communication strategy in HIV/AIDS intervention projects: An examination of a project targeting commercial sex workers in India. *Atlantic Journal of Communication*, 27(2), 139-151.
- David, B. (1960). The process of communication. *New York: Holt, Reinhart and Winston*.
- David, C. C., Ong, J. C., & Legara, E. F. T. (2016). Tweeting Supertyphoon Haiyan: Evolving functions of Twitter during and after a disaster event. *PLoS ONE*, 11(3), e0150190.
- Davies, A. J. (2019). Increasing the disaster resilience of remote communities through scenario co-creation.
- Dawson, P. (2020). Hashtag narrative: Emergent storytelling and affective publics in the digital age. *International Journal of Cultural Studies*, 23(6), 968-983.
- De Albuquerque, J. P., Herfort, B., Brenning, A., & Zipf, A. (2015). A geographic approach for combining social media and authoritative data towards identifying useful information for disaster management. *International journal of geographical information science*, 29(4), 667-689.
- De, L. L., Gaillard, J.-C., Gampell, A., Loodin, N., & Cadag, J. (2020). Participatory mapping 2.0: New ways for children's participation in disaster risk reduction. *Australian Journal of Emergency Management, The*, 35(2), 34-42.
- De Meyer, K., Coren, E., McCaffrey, M., & Slean, C. (2020). Transforming the stories we tell about climate change: from 'issue' to 'action'. *Environmental Research Letters*, 16(1), 015002.
- DeFilippis, J. (2001). The myth of social capital in community development. *Housing policy debate*, 12(4), 781-806.
- Delica-Willison, Z., & Gaillard, J.-C. (2012). Community action and disaster. In *Handbook of hazards and disaster risk reduction* (pp. 711-722). Routledge.
- Delwiche, A., & Henderson, J. J. (2012). *The participatory cultures handbook*. Routledge.
- DeMarrais, E., & Earle, T. (2017). Collective action theory and the dynamics of complex societies. *Annual Review of Anthropology*, 46, 183-201.
- Demeritt, D., & Nobert, S. (2014). Models of best practice in flood risk communication and management. *Environmental Hazards*, 13(4), 313-328.
- Denzin, N. K. (2010). Moments, mixed methods, and paradigm dialogs. *Qualitative inquiry*, 16(6), 419-427.
- Department of Internal Affairs. (2002). Local Government Act 2002 No 84 (as at 17 February 2024), Public Act Contents – New Zealand Legislation. In.
- Department of Internal Affairs. (2024). Government Inquiry into the Response to the North Island Severe Weather Events - dia.govt.nz. In.
- Devkota, B. P., Doberstein, B., & Nepal, S. K. (2016). Social capital and natural disaster: local responses to 2015 earthquake in Kathmandu. *International Journal of Mass Emergencies & Disasters*, 34(3), 439-466.

- Dharmasena, I., Toledano, M., & Weaver, C. K. (2020). The role of public relations in building community resilience to natural disasters: perspectives from Sri Lanka and New Zealand. *Journal of Communication Management*, 24(4), 301-317.
- Dhellemmes, A., Leonard, G. S., Johnston, D. M., Vinnell, L. J., Becker, J. S., Fraser, S. A., & Paton, D. (2021). Tsunami awareness and preparedness in Aotearoa New Zealand: The evolution of community understanding. *International Journal of Disaster Risk Reduction*, 65, 102576.
- Dillard, J. P., & Shen, L. (2013). *The Sage handbook of persuasion*. Sage.
- Dixon, S. J. (2023). *Countries with the most Facebook users 2023*. Statista. <https://www.statista.com/statistics/268136/top-15-countries-based-on-number-of-facebook-users/#:~:text=With%20around%202.9%20billion%20monthly,revenue%20is%20generated%20through%20advertising.>
- Dodson, G., & Palliser, A. (2019). Advancing practical theory in environmental communication: A phronetic analysis of environmental communication in New Zealand. In G. B. Walker & K. P. Hunt, Depoe, Stephen P., (Eds.), *Breaking Boundaries Innovative Practices in Environmental Communication and Public Participation*. State University of New York Press.
- Dohaney, J., Brogt, E., Kennedy, B., Wilson, T. M., & Lindsay, J. M. (2015). Training in crisis communication and volcanic eruption forecasting: design and evaluation of an authentic role-play simulation. *Journal of Applied Volcanology*, 4, 1-26.
- Douglas, M., & Wildavsky, A. (1983). *Risk and culture: An essay on the selection of technological and environmental dangers*. Univ of California Press.
- Doyle, E. E., & Becker, J. S. (2022). Understanding the risk communication puzzle for natural hazards and disasters. In *Oxford research encyclopedia of natural Hazard science*.
- Doyle, E. E., Harrison, S. E., Hill, S. R., Williams, M., Paton, D., & Bostrom, A. (2022). Eliciting mental models of science and risk for disaster communication: A scoping review of methodologies. *International Journal of Disaster Risk Reduction*, 77, 103084.
- Doyle, E. E., McClure, J., Potter, S. H., Becker, J. S., Johnston, D. M., Lindell, M. K., Johal, S., Fraser, S. A., & Coomer, M. A. (2018). Motivations to prepare after the 2013 Cook Strait Earthquake, NZ. *International Journal of Disaster Risk Reduction*, 31, 637-649.
- Doyle, E. E., Thompson, J., Hill, S., Williams, M., Paton, D., Harrison, S., Bostrom, A., & Becker, J. (2023). Where does scientific uncertainty come from, and from whom? Mapping perspectives of natural hazards science advice. *International Journal of Disaster Risk Reduction*, 96, 103948.
- Drennan, L. (2018). Community narratives of disaster risk and resilience: Implications for government policy. *Australian Journal of Public Administration*, 77(3), 456-467.
- Dufty, N. (2012). Using social media to build community disaster resilience. *Australian Journal of Emergency Management*, 27(1), 40-45.
- Dufty, N. (2015). The use of social media in countrywide disaster risk reduction public awareness strategies. *Australian Journal of Emergency Management, The*, 30(1), 12-16.

- Dunlop, E. (2023). *Integrating Mātauranga Māori into Community Resilience Frameworks for the Built Environment* [The University of Waikato].
- Dutta, M. J. (2015). A postcolonial critique of public relations. In *The Routledge handbook of critical public relations* (pp. 248-260). Routledge.
- Dutta, M. J. (2018). Culturally centering social change communication: Subaltern critiques of, resistance to, and re-imagination of development. *Journal of Multicultural Discourses*, 13(2), 87-104.
- Dynes, R. (2006). Social capital: Dealing with community emergencies. *Homeland Security Affairs*, 2(2).
- Dynes, R. R. (1993). Disaster reduction: The importance of adequate assumptions about social organization. *Sociological spectrum*, 13(1), 175-192.
- Dynes, R. R. (2002). The importance of social capital in disaster response.
- East Coast Lab. (2024). News | East Coast LAB | Hikurangi Subduction Zone M9. In.
- Eckert, S., Sopory, P., Day, A., Wilkins, L., Padgett, D., Novak, J., Noyes, J., Allen, T., Alexander, N., & Vanderford, M. (2018). Health-related disaster communication and social media: mixed-method systematic review. *Health Communication*, 33(12), 1389-1400.
- Eisenman, D., Chandra, A., Fogleman, S., Magana, A., Hendricks, A., Wells, K., Williams, M., Tang, J., & Plough, A. (2014). The Los Angeles County Community Disaster Resilience Project - a community-level, public health initiative to build community disaster resilience. *International Journal of Environmental Research and Public Health*, 11(8), 8475-8490. <https://doi.org/10.3390/ijerph110808475>
- Eiser, J. R., Bostrom, A., Burton, I., Johnston, D. M., McClure, J., Paton, D., Van Der Pligt, J., & White, M. P. (2012). Risk interpretation and action: A conceptual framework for responses to natural hazards. *International journal of disaster risk reduction*, 1, 5-16.
- Ellis, K., & Goggin, G. (2013). Disability and social media. In *The social media handbook* (pp. 126-143). Routledge.
- Elrick-Barr, C. E., & Smith, T. F. (2022). Current Information Provision Rarely Helps Coastal Households Adapt to Climate Change. *Sustainability*, 14(5), 2904.
- Emergency Management Canterbury. (2023). *Community Ready*. <https://www.cdemcanterbury.govt.nz/community-ready/>
- Endsley, T., Wu, Y., Reep, J., Eep, J., & Reep, J. (2014). The source of the story: Evaluating the credibility of crisis information sources. ISCRAM,
- Environment Southland Regional Council. (2023). Putting communities at the heart of emergency response - Environment Southland. In.
- Erickson, N. J. (1986). Creating Flood Disasters?: New Zealand's need for a new approach to urban flood hazard. In: New Zealand: National Water and Soil Conservation Authority.
- Escalas, J. E. (2004). Imagine yourself in the product: Mental simulation, narrative transportation, and persuasion. *Journal of advertising*, 33(2), 37-48.

- Evers, A., & von Essen, J. (2019). Volunteering and civic action: Boundaries blurring, boundaries redrawn. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 30, 1-14.
- Ewart, J., & McLean, H. (2015). Ducking for cover in the 'blame game': news framing of the findings of two reports into the 2010–11 Queensland floods. *Disasters*, 39(1), 166-184.
- Faas, A. (2016). Disaster vulnerability in anthropological perspective. *Annals of Anthropological Practice*, 40(1), 14-27.
- Fàbregues, S., & Molina-Azorín, J. F. (2017). Addressing quality in mixed methods research: A review and recommendations for a future agenda. *Quality & Quantity*, 51, 2847-2863.
- Farinosi, M., & Treré, E. (2014). Social Movements, Social Media and Postdisaster Resilience. *Theories, practices and examples for community and social*.
- Fearon, D., Hughes, S., & Brearley, S. G. (2021). Constructivist stakian multicase study: Methodological issues encountered in cross-cultural palliative care research. *International Journal of Qualitative Methods*, 20, 16094069211015075.
- Fekete, A., Hufschmidt, G., & Kruse, S. (2014). Benefits and challenges of resilience and vulnerability for disaster risk management. *International Journal of Disaster Risk Science*, 5, 3-20.
- Feldman, D., Contreras, S., Karlin, B., Basolo, V., Matthew, R., Sanders, B., Houston, D., Cheung, W., Goodrich, K., & Reyes, A. (2016). Communicating flood risk: Looking back and forward at traditional and social media outlets. *International journal of disaster risk reduction*, 15, 43-51.
- Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods*, 5(1), 80-92.
- Figuroa, E. J. (2022). Casting heroes and victims of disaster events: representations of race and gender in Hurricane Harvey front page news images. *Critical Studies in Media Communication*, 39(5), 455-471.
- Filstead, W. J. (1979). Qualitative methods: A needed perspective in evaluation research. *Qualitative and quantitative methods in evaluation research*, 1.
- Fink, A. (2003). *The survey handbook*. sage.
- Finnis, K. (2004). *Creating a resilient New Zealand: Can public education and community development campaigns create prepared communities? An examination of preparedness motivation strategies*. Ministry of Civil Defence & Emergency Management.
- Finnis, K. K., Johnston, D. M., Ronan, K. R., & White, J. D. (2010). Hazard perceptions and preparedness of Taranaki youth. *Disaster Prevention and Management: An International Journal*, 19(2), 175-184.
- Fire Emergency New Zealand. (2014). Youths say Yes to Emergency Services - Lake Okareka Volunteer Fire Brigade. In.
- Fischhoff, B. (1995). Risk perception and communication unplugged: twenty years of process 1. *Risk analysis*, 15(2), 137-145.

- Fisher, W. R. (1985). The narrative paradigm: An elaboration. *Communications Monographs*, 52(4), 347-367.
- Fitzharris, B. (2007). How vulnerable is New Zealand to the impacts of climate change? *New Zealand Geographer*, 63(3), 160-168.
- Flint, C. G., & Stevenson, J. (2010). Building community disaster preparedness with volunteers: Community emergency response teams in Illinois. *Natural Hazards Review*, 11(3), 118-124.
- Franco, Z. E., Blau, K., & Zimbardo, P. G. (2011). Heroism: A conceptual analysis and differentiation between heroic action and altruism. *Review of general psychology*, 15(2), 99-113.
- Fraustino, J. D., Liu, B., & Jin, Y. (2012). *Social media use during disasters: a review of the knowledge base and gaps*.
- Freudenberg, N., Pastor, M., & Israel, B. (2011). Strengthening community capacity to participate in making decisions to reduce disproportionate environmental exposures. *American Journal of Public Health*, 101(S1), S123-S130.
- Fu, S., Li, H., Liu, Y., Pirkkalainen, H., & Salo, M. (2020). Social media overload, exhaustion, and use discontinuance: Examining the effects of information overload, system feature overload, and social overload. *Information Processing & Management*, 57(6), 102307.
- Gabrielsen, H., Procter, J., Rainforth, H., Black, T., Harmsworth, G., & Pardo, N. (2018). Reflections from an indigenous community on volcanic event management, communications and resilience. *Observing the volcano world: volcano crisis communication*, 463-479.
- Gaillard, J.-C., & Maceda, E. A. (2009). Participatory three-dimensional mapping for disaster risk reduction. *Participatory learning and action*, 60(1), 109-118.
- Gaillard, J.-C., & Mercer, J. (2013). From knowledge to action: Bridging gaps in disaster risk reduction. *Progress in human geography*, 37(1), 93-114.
- Gambarato, R. R., & Medvedev, S. A. (2015). Fish Fight: Transmedia storytelling strategies for food policy change. *International Journal of E-Politics (IJEP)*, 6(3), 43-59.
- Garces-Ozanne, A., Makabenta-Ikeda, M., & Uekusa, S. (2022). Asian migrant worker experiences in Ōtautahi Christchurch. In *A decade of disaster experiences in Ōtautahi Christchurch: Critical disaster studies perspectives* (pp. 211-236). Springer.
- Garvey, A., & Paavola, J. (2022). Community action on natural flood management and the governance of a catchment-based approach in the UK. *Environmental Policy and Governance*, 32(1), 3-16.
- Gentle, P., Maraseni, T. N., Paudel, D., Dahal, G. R., Kanel, T., & Pathak, B. (2020). Effectiveness of community forest user groups (CFUGs) in responding to the 2015 earthquakes and COVID-19 in Nepal. *Research in Globalization*, 2, 100025.
- Gerbner, G. (1966). On defining communication: Still another view. *Journal of Communication*.
- Ghosh, S., Ghosh, K., Ganguly, D., Chakraborty, T., Jones, G. J., Moens, M.-F., & Imran, M. (2018). Exploitation of social media for emergency relief and preparedness: Recent research and trends. *Information Systems Frontiers*, 20, 901-907.

- Gill, P., Stewart, K., Treasure, E., & Chadwick, B. (2008). Methods of data collection in qualitative research: interviews and focus groups. *British dental journal*, 204(6), 291-295.
- Giorgi, A. P., & Giorgi, B. M. (2003). The descriptive phenomenological psychological method.
- Gladfelter, S. (2018). The politics of participation in community-based early warning systems: Building resilience or precarity through local roles in disseminating disaster information? *International journal of disaster risk reduction*, 30, 120-131.
- Glaser, B., & Strauss, A. (2017). *Discovery of grounded theory: Strategies for qualitative research*. Routledge.
- Glassey, S., Liebergreen, N., Ferrere, M. R., & King, M. (2023). It was one of the worst days of my life: Companion animal owners' experiences of the Edgecumbe 2017 flood in Aotearoa New Zealand. *International Journal of Disaster Risk Reduction*, 96, 103923.
- Glik, D. C. (2007). Risk communication for public health emergencies. *Annu. Rev. Public Health*, 28, 33-54.
- Godschalk, D. R., Brody, S., & Burby, R. (2003). Public participation in natural hazard mitigation policy formation: Challenges for comprehensive planning. *Journal of environmental planning and management*, 46(5), 733-754.
- Golding, D., Krinsky, S., & Plough, A. (1992). Evaluating risk communication: Narrative vs. technical presentations of information about radon. *Risk analysis*, 12(1), 27-35.
- Goldkuhl, G. (2012). Pragmatism vs interpretivism in qualitative information systems research. *European journal of information systems*, 21(2), 135-146.
- Gonsalves, C. A., McGannon, K. R., Schinke, R. J., & Pegoraro, A. (2017). Mass media narratives of women's cardiovascular disease: A qualitative meta-synthesis. *Health Psychology Review*, 11(2), 164-178.
- Gorman-Murray, A., McKinnon, S., Dominey-Howes, D., Nash, C. J., & Bolton, R. (2018). Listening and learning: Giving voice to trans experiences of disasters. *Gender, Place & Culture*, 25(2), 166-187.
- Gowan, M. E. (2011). *Self-Management of Disaster Risk and Uncertainty: The Role of Preventive Health in Building Disaster Resilience*.
- Gray, L. (2022). *Disaster risk reduction considerations for big bodied people in Aotearoa New Zealand: a thesis presented in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Emergency Management at Massey University, Wellington, Aotearoa New Zealand* [Massey University].
- Green, M. C., & Brock, T. C. (2002). In the mind's eye: Imagery and transportation into narrative worlds. *Narrative impact: Social and cognitive foundations*, 315-341.
- Greenaway, A., & Witten, K. (2006). Meta-analysing community action projects in Aotearoa New Zealand. *Community Development Journal*, 41(2), 143-159.

- Grindell, C., Coates, E., Croot, L., & O’Cathain, A. (2022). The use of co-production, co-design and co-creation to mobilise knowledge in the management of health conditions: a systematic review. *BMC Health Services Research*, 22(1), 877.
- Grunig, J. E. (2013). *Excellence in public relations and communication management*. Routledge.
- Grybovych, O., & Hafermann, D. (2013). Sustainable practices of community tourism planning: Lessons from a remote community. In *Tourism, Planning, and Community Development* (pp. 81-96). Routledge.
- Guetterman, T. C., & Fetters, M. D. (2018). Two methodological approaches to the integration of mixed methods and case study designs: A systematic review. *American behavioral scientist*, 62(7), 900-918.
- Habermas, J. (1984). *The theory of communicative action: Jurgen Habermas; trans. By thomas McCarthy*. Heinemann.
- Habiba, U., Shaw, R., & Abedin, M. A. (2013). Community-based disaster risk reduction approaches in Bangladesh. *Disaster risk reduction approaches in Bangladesh*, 259-279.
- Hadlos, A., Opdyke, A., & Hadigheh, S. A. (2022). Where does local and indigenous knowledge in disaster risk reduction go from here? A systematic literature review. *International Journal of Disaster Risk Reduction*, 79, 103160.
- Hafeez, K., Alghatas, F. M., Foroudi, P., Nguyen, B., & Gupta, S. (2019). Knowledge sharing by entrepreneurs in a virtual community of practice (VCoP). *Information Technology & People*, 32(2), 405-429.
- Hardin, R. (2015). *Collective action*. Rff Press.
- Harrison, H., Birks, M., Franklin, R., & Mills, J. (2017). Case study research: Foundations and methodological orientations. *Forum qualitative Sozialforschung/Forum: qualitative social research*,
- Harrison, R. L., Reilly, T. M., & Creswell, J. W. (2020). Methodological rigor in mixed methods: An application in management studies. *Journal of Mixed Methods Research*, 14(4), 473-495.
- Hasnain, T., Walton, T. N., Odubela, K., McConnell, S., Davis, L., Ivy, J., Jiang, S., Coan, D., Islam, M. H., & Mpere, E. (2023). Resiliency within the socio-ecological system of a large food bank network: preparing, mitigating, responding, and recovering from hurricane florence. *International Journal of Disaster Risk Reduction*, 88, 103580.
- Hawke's Bay Emergency Management Group. (2024). *Welcome to Hawke's Bay Civil Defence and Emergency Management*. <https://www.hbemergency.govt.nz/news/article/2/welcome-to-hawkes-bay-civil-defence-and-emergency-management>
- Haworth, B. (2016). Emergency management perspectives on volunteered geographic information: Opportunities, challenges and change. *Computers, Environment and Urban Systems*, 57, 189-198.
- Haworth, B., Whittaker, J., & Bruce, E. (2016). Assessing the application and value of participatory mapping for community bushfire preparation. *Applied Geography*, 76, 115-127.

- Hawthorn, S., Jesus, R., & Baptista, M. A. (2021). A review of digital serious games for tsunami risk communication. *International Journal of Serious Games*, 8(2), 21-47.
- Hay, K., & Pascoe, K. M. (2019). Disabled people and disaster management in New Zealand: Examining online media messages. *Disability & Society*, 34(2), 253-275.
- Hay, K., & Pascoe, K. M. (2021). Social workers and disaster management: An Aotearoa New Zealand perspective. *The British Journal of Social Work*, 51(5), 1531-1550.
- Hay, K., & Pascoe, K. M. (2022). Engaging social workers in disaster management: Case studies from New Zealand. *International Journal of Disaster Risk Reduction*, 74, 102941.
- Heath, R. L. (2013). *Encyclopedia of public relations*. SAGE publications.
- Heath, R. L., & Palenchar, M. (2000). Community relations and risk communication: A longitudinal study of the impact of emergency response messages. *Journal of Public Relations Research*, 12(2), 131-161.
- Heilemann, M. V., Martinez, A., & Soderlund, P. D. (2018). A mental health storytelling intervention using transmedia to engage Latinas: Grounded theory analysis of participants' perceptions of the story's main character. *Journal of medical Internet research*, 20(5), e10028.
- Henderson, L., Bain, H., Allan, E., & Kennedy, C. (2023). An Exploratory Multi-Case Study of the Health and Wellbeing Needs, Relationships and Experiences of Health and Social Care Service Users and the People who Support them at Home. *International journal of integrated care*, 23(1).
- Herzog, C., Handke, C., & Hitters, E. (2019). *Analyzing talk and text II: Thematic analysis*. Springer.
- Hicks, A., Barclay, J., Chilvers, J., Armijos, M. T., Oven, K., Simmons, P., & Haklay, M. (2019). Global mapping of citizen science projects for disaster risk reduction. *Frontiers in Earth Science*, 7, 226.
- Hikuroa, D., King, D., & Forsman, X. (2019). How indigenous knowledge can reduce risk, facilitate recovery and increase resilience. *Earth and Space Science Open Archive ESSOAr*.
- Hilhorst, D., & Heijmans, E. (2012). University research's role in reducing disaster risk. In *The Routledge Handbook of Hazards and Disaster Risk Reduction* (pp. 739-749). Routledge.
- Hinwood, K. (2022). Storytelling and Ethics: Understanding Ethical Storytelling for the Purpose of Business Education. In *Creative Business Education: Exploring the Contours of Pedagogical Praxis* (pp. 71-86). Springer.
- Holden, L. (2024). *Exploring Mobility Impairments in Aotearoa's Disaster Management: How Do People with Mobility Impairments Experience the 4Rs of Disaster Management?* Open Access Te Herenga Waka-Victoria University of Wellington].
- Holladay, S. J., & Tachkova, E. R. (2021). Public relations for stakeholder and societal engagement. In C. Valentini (Ed.), *Handbooks of Communication Science* (pp. 217).
- Hore, K., Gaillard, J., Davies, T., & Kearns, R. (2020). People's participation in disaster-risk reduction: recentering power. *Natural Hazards Review*, 21(2), 04020009.

- Hou, J. Z. (2023). The Re-enchantment of Narratives in Disaster Risk Communication: Developing a Storytelling Framework with “5C” Principles. In *Narratives in Public Communication* (pp. 178-197). Routledge.
- Houston, B. J. (2012). Public disaster mental/behavioral health communication: Intervention across disaster phases. *Journal of Emergency Management*, *10*(4), 283-292.
- Houston, B. J., Hawthorne, J., Perreault, M. F., Park, E. H., Goldstein Hode, M., Halliwell, M. R., Turner McGowen, S. E., Davis, R., Vaid, S., & McElderry, J. A. (2015). Social media and disasters: a functional framework for social media use in disaster planning, response, and research. *Disasters*, *39*(1), 1-22.
- Houston, B. J., Pfefferbaum, B., & Rosenholtz, C. E. (2012). Disaster news: Framing and frame changing in coverage of major US natural disasters, 2000–2010. *Journalism & Mass Communication Quarterly*, *89*(4), 606-623.
- Houston, B. J., Schraedley, M. K., Worley, M. E., Reed, K., & Saidi, J. (2019). Disaster journalism: fostering citizen and community disaster mitigation, preparedness, response, recovery, and resilience across the disaster cycle. *Disasters*, *43*(3), 591-611.
- Houston, B. J., Spialek, M. L., Cox, J., Greenwood, M. M., & First, J. (2015). The centrality of communication and media in fostering community resilience: A framework for assessment and intervention. *American Behavioral Scientist*, *59*(2), 270-283.
- Huesca, R. (2008). Tracing the history of participatory communication approaches to development: A critical appraisal. *Communication for development and social change*, *180*.
- Huffman, T. P. (2018). Paradigmatic tools for communication scholar–activists: toward a pragmatic and relational epistemology. *Review of Communication*, *18*(1), 19-36.
- Hügel, S., & Davies, A. R. (2020). Public participation, engagement, and climate change adaptation: A review of the research literature. *Wiley Interdisciplinary Reviews: Climate Change*, *11*(4), e645.
- Hughes, A. L., & Palen, L. (2009). Twitter adoption and use in mass convergence and emergency events. *International journal of emergency management*, *6*(3-4), 248-260.
- Huntington, H. P., Trainor, S. F., Natcher, D. C., Huntington, O. H., DeWilde, L. o., & Chapin III, F. S. (2006). The significance of context in community-based research: understanding discussions about wildfire in Huslia, Alaska. *Ecology and Society*, *11*(1).
- Hutton, J. G. (1999). The definition, dimensions, and domain of public relations. *Public Relations Review*, *25*(2), 199-214.
- Imperiale, A. J., & Vanclay, F. (2016). Experiencing local community resilience in action: Learning from post-disaster communities. *Journal of Rural Studies*, *47*, 204-219.
- Inelmen, K., Iseri Say, A., & Kabasakal, H. (2004). Participation lethargy in disaster preparedness organizations within the framework of a Turkish CBO. *International Journal of Sociology and Social Policy*, *24*(10/11), 130-158.
- Insall, R. (2023). Science Twitter—navigating change in science communication. *Nature reviews molecular cell biology*, *24*(5), 305-306.

- Irawanto, B. (2018). Narratives of natural disaster survivors in Indonesian media. *Pacific Journalism Review*, 24(1), 37-51.
- Ireland, P., & Thomalla, F. (2011). The role of collective action in enhancing communities' adaptive capacity to environmental risk: an exploration of two case studies from Asia. *PLoS currents*, 3.
- Irvin, R. A., & Stansbury, J. (2004). Citizen participation in decision making: is it worth the effort? *Public Administration Review*, 64(1), 55-65.
- Ito-Morales, K. (2024). Community-based fire management and beyond: Role and problems of volunteer fire department shōbōdan in Japanese urban spaces and peri-urban forest environments. *Trees, Forests and People*, 100531.
- Jahangiri, K., Izadkhan, Y. O., & Tabibi, S. J. (2011). A comparative study on community-based disaster management in selected countries and designing a model for Iran. *Disaster Prevention and Management: An International Journal*, 20(1), 82-94.
- Jamshidi, E., Majdzadeh, R., Namin, M. S., Ardalan, A., Majdzadeh, B., & Seydali, E. (2016). Effectiveness of community participation in earthquake preparedness: a community-based participatory intervention study of Tehran. *Disaster medicine and public health preparedness*, 10(2), 211-218.
- Janssen, E., van Osch, L., de Vries, H., & Lechner, L. (2013). The influence of narrative risk communication on feelings of cancer risk. *British Journal of Health Psychology*, 18(2), 407-419.
- Jerolleman, A. (2021). Storytelling and Narrative Research in Crisis and Disaster Studies. In *Oxford Research Encyclopedia of Politics*.
- Jha, A., Lin, L., & Savoia, E. (2016). The use of social media by state health departments in the US: analyzing health communication through Facebook. *Journal of community health*, 41, 174-179.
- Johnson, B. B. (2012). Climate change communication: A provocative inquiry into motives, meanings, and means. *Risk Analysis: An International Journal*, 32(6), 973-991.
- Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational researcher*, 33(7), 14-26.
- Johnson, V. A., Ronan, K. R., Johnston, D. M., & Peace, R. (2014). Evaluations of disaster education programs for children: A methodological review. *International Journal of Disaster Risk Reduction*, 9, 107-123.
- Johnston, D. M., Bebbington Chin-Diew Lai, M. S., Houghton, B. F., & Paton, D. (1999). Volcanic hazard perceptions: comparative shifts in knowledge and risk. *Disaster Prevention and Management: An International Journal*, 8(2), 118-126.
- Johnston, J., & Zawawi, C. (2020). An overview of public relations. In J. Johnston (Ed.), *Public relations: Theory and practice*. Routledge.
- Jones, M. D. (2014). Cultural characters and climate change: How heroes shape our perception of climate science. *Social Science Quarterly*, 95(1), 1-39.

- Jones, S., Oven, K. J., Manyena, B., & Aryal, K. (2014). Governance struggles and policy processes in disaster risk reduction: A case study from Nepal. *Geoforum*, 57, 78-90.
- Jordana, J. (1999). Collective action theory and the analysis of social capital. In *Social capital and European democracy* (pp. 45-72). Routledge.
- Joseph, J. K., Dev, K. A., Pradeepkumar, A., & Mohan, M. (2018). Big data analytics and social media in disaster management. In *Integrating disaster science and management* (pp. 287-294). Elsevier.
- Jull, J., Giles, A., & Graham, I. D. (2017). Community-based participatory research and integrated knowledge translation: advancing the co-creation of knowledge. *Implementation science*, 12, 1-9.
- Jung, E., & Kim, Y.-C. (2021). Commuting, communication, and community engagement from a communication infrastructure theory perspective. *Communication Research*, 48(5), 740-766.
- Kahan, D. M., & Slovic, P. (2005). Cultural Evaluations of Risk: "Values" or "Blunders"? *Harv. L. Rev. F.*, 119, 166.
- Kaigo, M. (2012). Social media usage during disasters and social capital: Twitter and the Great East Japan earthquake. *Keio communication review*, 34(1), 19-35.
- Kaiser, A., Balfour, N., Fry, B., Holden, C., Litchfield, N., Gerstenberger, M., D'anastasio, E., Horspool, N., McVerry, G., & Ristau, J. (2017). The 2016 Kaikōura, New Zealand, earthquake: preliminary seismological report. *Seismological Research Letters*, 88(3), 727-739.
- Kankanamge, N., Yigitcanlar, T., & Goonetilleke, A. (2022). Gamifying Community Education for Enhanced Disaster Resilience: An Effectiveness Testing Study from Australia. *Future Internet*, 14(6), 179.
- Kaufhold, M.-A., & Reuter, C. (2016). The self-organization of digital volunteers across social media: The case of the 2013 European floods in Germany. *Journal of Homeland Security and Emergency Management*, 13(1), 137-166.
- Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a research paradigm and its implications for social work research. *Social sciences*, 8(9), 255.
- Keczer, Z., File, B., Orosz, G., & Zimbardo, P. G. (2016). Social representations of hero and everyday hero: A network study from representative samples. *PLoS ONE*, 11(8), e0159354.
- Kelman, I., Gaillard, J., Mercer, J., Lewis, J., & Carrigan, A. (2015). Island Vulnerability and Resilience: Combining Knowledges for Disaster Risk Reduction, Including Climate Change Adaptation. In *Global Ecologies and the Environmental Humanities* (pp. 162-186). Routledge.
- Kelman, I., Mercer, J., & Gaillard, J. (2012). Indigenous knowledge and disaster risk reduction. *Geography*, 97(1), 12-21.
- Kench, P. S., Ryan, E. J., Owen, S., Bell, R., Lawrence, J., Glavovic, B., Blackett, P., Becker, J., Schneider, P., & Allis, M. (2018). Co-creating resilience solutions to coastal hazards through an interdisciplinary research project in New Zealand. *Journal of Coastal Research*(85), 1496-1500.

- Kenens, J., Van Oudheusden, M., Yoshizawa, G., & Van Hoyweghen, I. (2020). Science by, with and for citizens: rethinking 'citizen science' after the 2011 Fukushima disaster. *Palgrave communications*, 6(1), 1-8.
- Kenney, C., Phibbs, S., Meo-Sewabu, L., Awatere, S., McCarthy, M., Kaiser, L., Harmsworth, G., Harcourt, N., Taylor, L., & Douglas, N. (2023). Indigenous approaches to disaster risk reduction, community sustainability, and climate change resilience. In *Disaster Risk Reduction for Resilience: Climate Change and Disaster Risk Adaptation* (pp. 37-59). Springer.
- Kerr, J., Thomson, G., & Wilson, N. (2023). Cyclone Gabrielle joins list of Aotearoa NZ's 'sudden mass fatality events'.
- Kheerajit, C., & Flor, A. G. (2013). Participatory development communication for natural resources management in Ratchaburi Province, Thailand. *Procedia-Social and Behavioral Sciences*, 103, 703-709.
- Kilvington, M., & Saunders, W. (2019). Gaining public input on natural hazard risk and land-use planning: A case study from New Zealand. *Disaster Prevention and Management: An International Journal*, 28(2), 228-244.
- Kim, C., Atkinson, S., & Lee, J. Y. (2021). Facebook as an official communication channel in a crisis. *The AUSTRALIAN JOURNAL OF EMERGENCY MANAGEMENT*, 36(1), 92-98.
- Kim, E., & Kim, Y. C. (2021). Communication infrastructure, migrant community engagement, and integrative adaptation of Korean Chinese migrants in Seoul. *Communication Research*, 48(5), 717-739.
- Kim, M., & Choi, Y. (2017). Risk communication: The roles of message appeal and coping style. *Social Behavior and Personality: an international journal*, 45(5), 773-784.
- Kim, Y. C., & Ball-Rokeach, S. J. (2006a). Civic engagement from a communication infrastructure perspective [Article]. *Communication Theory*, 16(2), 173-197. <https://doi.org/10.1111/j.1468-2885.2006.00267.x>
- Kim, Y. C., & Ball-Rokeach, S. J. (2006b). Community storytelling network, neighborhood context, and civic engagement: A multilevel approach [Article]. *Human Communication Research*, 32(4), 411-439. <https://doi.org/10.1111/j.1468-2958.2006.00282.x>
- King, D. (2015). Tsunami hazard, assessment and risk in Aotearoa–New Zealand: A systematic review AD 1868–2012. *Earth-Science Reviews*, 145, 25-42.
- Kirby, R. H., Reams, M., & Lam, N. S.-N. (2023). The Use of Social Media by Emergency Stakeholder Groups: Lessons Learned from Areas Affected by Hurricanes Isaac and Sandy. *Journal of Homeland Security and Emergency Management*, 20(2), 133-168.
- Kitchin, T. (2023, 2023-07-18). *Social media's new revolution*. @radionz. <https://www.rnz.co.nz/programmes/the-detail/story/2018898243/social-media-s-new-revolution>
- Klaiman, T., Knorr, D., Fitzgerald, S., Demara, P., Thomas, C., Heake, G., & Hausman, A. (2010). Locating and communicating with at-risk populations about emergency preparedness: the vulnerable

- populations outreach model. *Disaster Medicine and Public Health Preparedness*, 4(3), 246-251. <https://doi.org/10.1001/dmp.2010.25>
- Klavina, L., & van Zomeren, M. (2020). Protesting to protect “us” and/or “them”? Explaining why members of third groups are willing to engage in collective action. *Group Processes & Intergroup Relations*, 23(1), 140-160.
- Knuth, D., Szymczak, H., Kuecuekbalaban, P., & Schmidt, S. (2016). Social media in emergencies: How useful can they be. 2016 3rd International Conference on Information and Communication Technologies for Disaster Management (ICT-DM),
- Korstjens, I., & Moser, A. (2018). Series: Practical guidance to qualitative research. Part 4: Trustworthiness and publishing. *European Journal of General Practice*, 24(1), 120-124.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.
- Kreps, G. A. (1984). Sociological inquiry and disaster research. *Annual review of sociology*, 309-330.
- Kruger, J., Hinton, C. F., Sinclair, L. B., & Silverman, B. (2018). Enhancing individual and community disaster preparedness: Individuals with disabilities and others with access and functional needs. *Disability and health journal*, 11(2), 170-173.
- Kulatunga, U., Amaratunga, R., Zaman, M., Biswan, A., & Parvez, A. (2010). Community risk assessment for disaster risk reduction: challenges and future.
- Kundu, S., & Nawaz, M. (2017). Geospatial risk communication and visualization of natural hazards using augmented reality constructs. Global civil engineering conference,
- Kurian, J. C., & John, B. M. (2017). User-generated content on the Facebook page of an emergency management agency: a thematic analysis. *Online Information Review*, 41(4), 558-579.
- Kuttschreuter, M., Rutsaert, P., Hilverda, F., Regan, Á., Barnett, J., & Verbeke, W. (2014). Seeking information about food-related risks: The contribution of social media. *Food quality and preference*, 37, 10-18.
- Kwok, A. H. (2018). *Assessing social resilience to disasters at the neighbourhood level: co-producing a resilience assessment framework: a thesis presented in fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology (Emergency Management) at Massey University, Wellington, New Zealand Massey University*].
- Kwok, A. H., Becker, J., Paton, D., Hudson-Doyle, E., & Johnston, D. (2019). Stakeholders’ perspectives of social capital in informing the development of neighborhood-based disaster resilience measurements. *Journal of Applied Social Science*, 13(1), 26-57.
- Kwok, A. H., Doyle, E. E., Becker, J., Johnston, D., & Paton, D. (2016). What is ‘social resilience’? Perspectives of disaster researchers, emergency management practitioners, and policymakers in New Zealand. *International Journal of Disaster Risk Reduction*, 19, 197-211.
- Kyne, D., & Aldrich, D. P. (2020). Capturing bonding, bridging, and linking social capital through publicly available data. *Risk, Hazards & Crisis in Public Policy*, 11(1), 61-86.

- Lam, R. P. K., Leung, L. P., Balsari, S., Hsiao, K.-h., Newnham, E., Patrick, K., Pham, P., & Leaning, J. (2017). Urban disaster preparedness of Hong Kong residents: A territory-wide survey. *International journal of disaster risk reduction*, 23, 62-69.
- Lambert, S., & Mark-Shadbolt, M. (2021). Indigenous knowledges of forest and biodiversity management: How the watchfulness of Māori complements and contributes to disaster risk reduction. *AlterNative: An International Journal of Indigenous Peoples*, 17(3), 368-377.
- Lambert, S. J., Shadbolt, M., Ataria, J. M., & Black, A. (2012). Indigenous resilience through urban disaster: the Maori response to the 2010 and 2011 Christchurch Otautahi earthquakes.
- Langer, E., & Wegner, S. (2018). Wildfire risk awareness, perception and preparedness in the urban fringe in Aotearoa/New Zealand: Public responses to the 2017 Port Hills wildfire. *Australasian Journal of Disaster and Trauma Studies*, 22, 29-33.
- Le Coz, J., Patalano, A., Collins, D., Guillén, N. F., García, C. M., Smart, G. M., Bind, J., Chiaverini, A., Le Boursicaud, R., & Dramais, G. (2016). Crowdsourced data for flood hydrology: Feedback from recent citizen science projects in Argentina, France and New Zealand. *Journal of Hydrology*, 541, 766-777.
- Lederman, J. (2019). The people's plan? Participation and post-politics in Flint's master planning process. *Critical Sociology*, 45(1), 85-101.
- Leech, N. L., Dellinger, A. B., Brannagan, K. B., & Tanaka, H. (2010). Evaluating mixed research studies: A mixed methods approach. *Journal of Mixed Methods Research*, 4(1), 17-31.
- Leeming, D. (2018). The use of theory in qualitative research. *Journal of Human Lactation*, 34(4), 668-673.
- Lejano, R. P., Casas, E. V., Montes, R. B., & Lengwa, L. P. (2018). Weather, climate, and narrative: A relational model for democratizing risk communication [Article]. *Weather, Climate, and Society*, 10(3), 579-594. <https://doi.org/10.1175/wcas-d-17-0050.1>
- Lejano, R. P., Casas Jr, E. V., Pormon, M. M. M., & Yanger, M. J. (2020). Teaching to the nth: Narrative knowledge and the relational model of risk communication. *International Journal of Disaster Risk Reduction*, 50, 101720.
- Lejano, R. P., Haque, A., Kabir, L., Rahman, M. S., Pormon, M. M., & Casas, E. (2023). Design and implementation of a relational model of risk communication [Article]. *Disaster Prevention and Management: An International Journal*, 32(1), 117-138. <https://doi.org/10.1108/DPM-07-2022-0153>
- Lejano, R. P., Haque, C. E., & Berkes, F. (2021). Co-production of risk knowledge and improvement of risk communication: A three-legged stool. *International Journal of Disaster Risk Reduction*, 64, 102508.
- Lejano, R. P., Rahman, M. S., Kabir, L., & Urrutia, I. (2022). Perspectives from the field: Evaluation of a relational model of risk communication in the context of extreme weather. *Climate Risk Management*, 37, 100444.
- Lempert, R. J., Busch, L., Brown, R., Patton, A., Turner, S., Schmidt, J., & Young, T. (2023). Community-Level, Participatory Co-Design for Landslide Warning with Implications for Climate Services

- Leonard, G. S., Johnston, D. M., Paton, D., Christianson, A., Becker, J., & Keys, H. (2008). Developing effective warning systems: Ongoing research at Ruapehu volcano, New Zealand. *Journal of Volcanology and Geothermal Research*, 172(3-4), 199-215.
- Lester, J. N., Cho, Y., & Lochmiller, C. R. (2020). Learning to do qualitative data analysis: A starting point. *Human resource development review*, 19(1), 94-106.
- Lin, N. (2001). *Social Capital: a theory of social structure and action* Cambridge University Press. New York.
- Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011). Paradigmatic controversies, contradictions, and emerging confluences, revisited. *The Sage handbook of qualitative research*, 4(2), 97-128.
- Lindell, M. K., & Perry, R. W. (2012). The protective action decision model: Theoretical modifications and additional evidence. *Risk Analysis: An International Journal*, 32(4), 616-632.
- Littlefield, R., Rowan, K., Veil, S. R., Kisselburgh, L., Beauchamp, K., Vidoloff, K., Dick, M. L., Russell-Loretz, T., Kim, I., & Ruvarac, A. (2012). "We tell people. It's up to them to be prepared." Public Relations Practices of Local Emergency Managers. *The handbook of crisis communication*, 245-260.
- Liu, B. F., Austin, L., Lee, Y.-I., Jin, Y., & Kim, S. (2020). Telling the tale: The role of narratives in helping people respond to crises. *Journal of Applied Communication Research*, 48(3), 328-349.
- Liu, W. (2022). Disaster communication ecology in multiethnic communities: Understanding disaster coping and community resilience from a communication resource approach. *Journal of International and Intercultural Communication*, 15(1), 94-117.
- Lo, A. Y., & Chan, F. (2017). Preparing for flooding in England and Wales: the role of risk perception and the social context in driving individual action. *Natural Hazards*, 88, 367-387.
- Lopez, V., & Whitehead, D. (2013). Sampling data and data collection in qualitative research. *Nursing & midwifery research: Methods and appraisal for evidence-based practice*, 123, 140.
- Lovari, A. (2020). Spreading (dis) trust: Covid-19 misinformation and government intervention in Italy. *Media and Communication*, 8(2), 458-461.
- Luke, A., Sanders, B. F., Goodrich, K. A., Feldman, D. L., Boudreau, D., Eguiarte, A., Serrano, K., Reyes, A., Schubert, J. E., & AghaKouchak, A. (2018). Going beyond the flood insurance rate map: Insights from flood hazard map co-production. *Natural Hazards and Earth System Sciences*, 18(4), 1097-1120.
- Luna, E. M. (2013). Community-based disaster risk reduction and disaster management. In *Disaster Management* (pp. 43-63). Routledge.
- Luna, S., & Pennock, M. J. (2018). Social media applications and emergency management: A literature review and research agenda. *International journal of disaster risk reduction*, 28, 565-577.

- Maarouf, H. (2019). Pragmatism as a supportive paradigm for the mixed research approach: Conceptualizing the ontological, epistemological, and axiological stances of pragmatism. *International Business Research*, 12(9), 1-12.
- MacAskill, K. (2019). Public interest and participation in planning and infrastructure decisions for disaster risk management. *International journal of disaster risk reduction*, 39, 101200.
- Macaulay, A. C. (2017). Participatory research: What is the history? Has the purpose changed? In (Vol. 34, pp. 256-258): Oxford University Press UK.
- Macherera, M., & Chimbari, M. J. (2016). A review of studies on community based early warning systems. *Jàmhá: journal of disaster risk studies*, 8(1).
- Mamoru, M., Daiki, K., Tomoki, U., Abdul Wahid Mohamed, R., Masaki, Y., Della Grace, B., Anthony, C. S., Toshio, K., & Masaru, K. (2022). Co-Design for Enhancing Flood Resilience in Davao City, Philippines. *Water*, 14(978), 978-978. <https://doi.org/10.3390/w14060978>
- Mansell, R., & Raboy, M. (2011). Introduction: Foundations of the theory and practice of global media and communication policy. *The handbook of global media and communication policy*, 1-20.
- Mansell, R., & Raboy, M. (2014). *The handbook of global media and communication policy*.
- Marchezini, V., Horita, F. E. A., Matsuo, P. M., Trajber, R., Trejo-Rangel, M. A., & Olivato, D. (2018). A review of studies on Participatory Early Warning Systems (P-EWS): Pathways to support citizen science initiatives. *Frontiers in Earth Science*, 6, 184.
- Margolis, M. A., Brewer, N. T., Shah, P. D., Calo, W. A., & Gilkey, M. B. (2019). Stories about HPV vaccine in social media, traditional media, and conversations. *Preventive medicine*, 118, 251-256.
- Marlowe, J., Jehan, F., Udahemuka, M., Mizero, A., Jaduram, R., Rotstein, J., Alam, Z. Z., Nkessah, Z., Osman, M., & Aung, S. (2022). Disaster communications with resettled refugees: Six principles of engagement. *International Journal of Disaster Risk Reduction*, 67, 102672.
- Marlowe, J., Neef, A., Tevaga, C. R., & Tevaga, C. (2018). A new guiding framework for engaging diverse populations in disaster risk reduction: Reach, relevance, receptiveness, and relationships. *International Journal of Disaster Risk Science*, 9, 507-518.
- Marsh, D. R., Schroeder, D. G., Dearden, K. A., Sternin, J., & Sternin, M. (2004). The power of positive deviance. *Bmj*, 329(7475), 1177-1179.
- Massey University. *PhD Thesis with Publications*. [https://www.massey.ac.nz/massey/fms/Research/Guidelines%20for%20PhD%20Thesis%20with%20Publications%20\(1\).pdf?ED0D900F4978FA0A4A0F667A7840A75F](https://www.massey.ac.nz/massey/fms/Research/Guidelines%20for%20PhD%20Thesis%20with%20Publications%20(1).pdf?ED0D900F4978FA0A4A0F667A7840A75F)
- Matheson, D., & Jones, A. (2016). Communication in a post-disaster community: The struggle to access social capital. *International Journal of Communication*, 10, 18.
- Maxwell, J. A. (2012). *A realist approach for qualitative research*. Sage.
- Mayer, B. (2019). A review of the literature on community resilience and disaster recovery. *Current environmental health reports*, 6, 167-173.

- McBride, S. K. (2017). *The Canterbury tales: An insider's lessons and reflections from the Canterbury Earthquake Sequence to inform better public communication models. Doctor of Philosophy, Wellington, Massey University.*
- McBride, S. K., & Ball, J. (2022). #TheSmoreYouKnow and#emergencycute: A conceptual model on the use of humor by science agencies during crisis to create connection, empathy, and compassion. *International Journal of Disaster Risk Reduction, 77*, 102995.
- McBride, S. K., Becker, J. S., & Johnston, D. M. (2019). Exploring the barriers for people taking protective actions during the 2012 and 2015 New Zealand ShakeOut drills. *International Journal of Disaster Risk Reduction, 37*, 101150.
- McBride, S. K., Llenos, A. L., Page, M. T., & van der Elst, N. (2020). #EarthquakeAdvisory: Exploring discourse between government officials, news media, and social media during the 2016 Bombay Beach Swarm. *Seismological Research Letters, 91*(1), 438-451.
- McCaffrey, S. (2015). Community wildfire preparedness: A global state-of-the-knowledge summary of social science research. *Current Forestry Reports, 1*, 81-90.
- McCarthy, J. D., & Zald, M. N. (1977). Resource mobilization and social movements: A partial theory. *American journal of sociology, 82*(6), 1212-1241.
- McClure, J., White, J., & Sibley, C. G. (2009). Framing effects on preparation intentions: distinguishing actions and outcomes. *Disaster Prevention and Management: An International Journal, 18*(2), 187-199.
- McComas, K. A. (2006). Defining moments in risk communication research: 1996–2005. *Journal of Health Communication, 11*(1), 75-91.
- McCombs, M. (1977). Agenda setting function of mass media. *Public relations review, 3*(4), 89-95.
- McCormick, S. (2016). New tools for emergency managers: An assessment of obstacles to use and implementation. *Disasters, 40*(2), 207-225.
- McCrudden, M. T., Marchand, G., & Schutz, P. A. (2021). Joint displays for mixed methods research in psychology. *Methods in Psychology, 5*, 100067.
- McEwen, L., Holmes, A., Quinn, N., & Cobbing, P. (2018). 'Learning for resilience': Developing community capital through flood action groups in urban flood risk settings with lower social capital [Article]. *International Journal of Disaster Risk Reduction, 27*, 329-342. <https://doi.org/10.1016/j.ijdrr.2017.10.018>
- McEwen, L., Krause, F., Jones, O., & Hansen, J. G. (2012). Sustainable flood memories, informal knowledge and the development of community resilience to future flood risk. *WIT Transactions on Ecology and the Environment, 159*, 253-264.
- McFarlane, B. L., McGee, T. K., & Faulkner, H. (2011). Complexity of homeowner wildfire risk mitigation: an integration of hazard theories. *International Journal of Wildland Fire, 20*(8), 921-931.
- McGee, T., & Langer, E. L. (2019). Residents' preparedness, experiences and actions during an extreme wildfire in the Far North, Aotearoa New Zealand. *International Journal of Disaster Risk Reduction, 41*, 101303.

- McIvor, D., & Paton, D. (2007). Preparing for natural hazards: normative and attitudinal influences. *Disaster Prevention and Management: An International Journal*, 16(1), 79-88.
- McKinzie, A. E. (2017). Deconstruction of destruction stories: narrative, inequality, and disasters. *Disasters*, 41(1), 3-22.
- McLachlan, A. D., & Waitoki, W. (2022). Collective action by Māori in response to flooding in the southern Rangitīkei region. *International Journal of Health Promotion and Education*, 60(1), 15-24.
- McLennan, B. (2022). Volunteers and community participation. *Routledge Handbook of Environmental Hazards and Society*, 351-364.
- McLennan, B., Whittaker, J., & Handmer, J. (2016a). The changing landscape of disaster volunteering: opportunities, responses and gaps in Australia [Original Paper]. *Natural Hazards: Journal of the International Society for the Prevention and Mitigation of Natural Hazards*, 84(3), 2031-2048. <https://doi.org/10.1007/s11069-016-2532-5>
- McLennan, B., Whittaker, J., & Handmer, J. (2016b). The changing landscape of disaster volunteering: opportunities, responses and gaps in Australia. *Natural Hazards*, 84, 2031-2048.
- McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of community psychology*, 14(1), 6-23.
- Mercer, J., Kelman, I., Taranis, L., & Suchet-Pearson, S. (2010). Framework for integrating indigenous and scientific knowledge for disaster risk reduction. *Disasters*, 34(1), 214-239.
- Merchant, R. M., Elmer, S., & Lurie, N. (2011). Integrating social media into emergency-preparedness efforts. *New England journal of medicine*, 365(4), 289-291.
- Merriam, S. B. (1998). *Qualitative Research and Case Study Applications in Education. Revised and Expanded from "Case Study Research in Education."* ERIC.
- Mertens, D. M. (2008). *Transformative research and evaluation*. Guilford press.
- Meyer, M. A. (2018). Social capital in disaster research. *Handbook of disaster research*, 263-286.
- Meyer, R., & Kunreuther, H. (2017). *The ostrich paradox: Why we underprepare for disasters*. University of Pennsylvania Press.
- Michalis, P., Anniés, J., Papathanasiou, C., Ouzounoglou, E., & Admitis, A. (2022). Co-creation as an approach to bridge the Risk Perception Action Gap and customise crowdsourcing tools to respond effectively to climatic risks. Proceedings of the 3rd International Conference on Natural Hazards and Infrastructure,
- Miles, B., & Morse, S. (2007). The role of news media in natural disaster risk and recovery. *Ecological economics*, 63(2-3), 365-373.
- Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative Data Analysis - A methods sourcebook*. Sage Publications, Inc.
- Miller, M., Paton, D., & Johnston, D. (1999). Community vulnerability to volcanic hazard consequences. *Disaster Prevention and Management: An International Journal*, 8(4), 255-260.

- Mills, A. J., Durepos, G., & Wiebe, E. (2009a). Case Selection. In A. J. Mills, G. Durepos, & E. Wiebe (Eds.), *Encyclopedia of case study research*. Sage Publications.
- Mills, A. J., Durepos, G., & Wiebe, E. (2009b). *Encyclopedia of case study research*. Sage Publications.
- Ministry for the Environment. (1991). Resource Management Act 1991 No 69 (as at 02 April 2024), Public Act Contents – New Zealand Legislation. In.
- National Disaster Resilience Strategy, (2019). <https://www.civildefence.govt.nz/cdem-sector/plans-and-strategies/national-disaster-resilience-strategy/#:~:text=in%20New%20Zealand-,The%20National%20Disaster%20Resilience%20Strategy%20outlines%20the%20vision%20and%20long,over%20the%20next%2010%20years.>
- Ministry of Civil Defence and Emergency Management. (2002). *Civil Defence Emergency Management Act 2002*. Retrieved from <https://www.legislation.govt.nz/act/public/2002/0033/51.0/DLM149789.html>
- Ministry of Civil Defence Emergency Management. (2010). Community Engagement in the CDEM context Best Practice Guideline for Civil Defence Emergency Management Sector BPG 4/10. In.
- Ministry of Civil Defence Emergency Management. (2016). Public-education-strategy-FINAL-July-2016.docx. In.
- Minucci, G., Molinari, D., Gemini, G., & Pezzoli, S. (2020). Enhancing flood risk maps by a participatory and collaborative design process. *International Journal of Disaster Risk Reduction*, 50, 101747.
- Mitchell, A., Glavovic, B., Hutchinson, B., MacDonald, G., Roberts, M., & Goodland, J. (2010). Community-based civil defence emergency management planning in Northland, New Zealand. *the Australasian Journal of disaster and trauma studies*, 1, 2010-2011.
- Mitchell, A., Glavovic, B. C., Hutchinson, B., MacDonald, G., Roberts, M., & Goodland, J. (2010). Community-based civil defence emergency management planning in Northland, New Zealand. *Australasian Journal of Disaster and Trauma Studies*, 1, 2010-2011. <https://trauma.massey.ac.nz/issues/2010-1/mitchell.htm>
- Möller, C., Wang, J., & Nguyen, H. T. (2018). # Strongerthanwinston: Tourism and crisis communication through Facebook following tropical cyclones in Fiji. *Tourism Management*, 69, 272-284.
- Montag, C., Yang, H., & Elhai, J. D. (2021). On the psychology of TikTok use: A first glimpse from empirical findings. *Frontiers in Public Health*, 9, 641673.
- Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1), 48-76.
- Morgan, D. L. (2014a). Pragmatism as a paradigm for mixed methods research. *Integrating qualitative and quantitative methods*, 55, 25-44.
- Morgan, D. L. (2014b). Pragmatism as a paradigm for social research. *Qualitative inquiry*, 20(8), 1045-1053.
- Morgan, H. (2022). Conducting a Qualitative Document Analysis. *The Qualitative Report*, 27(1), 64-77.

- Morgan, M. G. (2002). *Risk communication: A mental models approach*. Cambridge University Press.
- Morris, B. S., Chrysochou, P., Christensen, J. D., Orquin, J. L., Barraza, J., Zak, P. J., & Mitkidis, P. (2019). Stories vs. facts: triggering emotion and action-taking on climate change. *Climatic Change*, *154*, 19-36.
- Morse, J. M. (2010). Simultaneous and sequential qualitative mixed method designs. *Qualitative Inquiry*, *16*(6), 483-491.
- Mosurska, A., Clark-Ginsberg, A., Ford, J., Sallu, S. M., & Davis, K. (2023). International humanitarian narratives of disasters, crises, and Indigeneity. *Disasters*.
- Mullan, J., Metusela, C., Guppy, M., Pond, D., Ivers, R., Hoffman, R., Rhee, J., Hespe, C., Davis, A., & Barnett, S. (2022). Development of a COVID-19 virtual community of practice in New South Wales. *Australian Journal of General Practice*, *51*(4), 263-269.
- Musacchio, G., Falsaperla, S., Solarino, S., Piangiamore, G. L., Crescimbene, M., Pino, N. A., Eva, E., Reitano, D., Manzoli, F., & Fabbri, M. (2017). KnowRISK on Seismic Risk Communication: the set-up of a participatory strategy-Italy Case study. International Conference on Earthquake Engineering and Structural Dynamics,
- Nah, S., Kwon, H. K., Liu, W., & McNealy, J. E. (2021). Communication infrastructure, social media, and civic participation across geographically diverse communities in the United States. *Communication Studies*, *72*(3), 437-455.
- Nah, S., Namkoong, K., Chen, N. T. N., & Hustedde, R. J. (2016). A communicative approach to community development: The effect of neighborhood storytelling network on civic participation. *Community Development*, *47*(1), 11-28.
- Nakamura, H., Umeki, H., & Kato, T. (2017). Importance of communication and knowledge of disasters in community-based disaster-prevention meetings. *Safety Science*, *99*, 235-243.
- National Emergency Management Agency. *Get prepared*. <https://getready.govt.nz/en/prepared>
- National Emergency Management Agency. (2023a). 2023 Annual Emergency Preparedness Survey NEMA. https://www.civildefence.govt.nz/assets/Uploads/documents/research/NEMA-emergency-preparedness_TRA-insight-report.pdf
- National Emergency Management Agency. (2023b). *Get your community ready*. <https://getready.govt.nz/assets/Uploads/documents/alternate-formats/large-print/pdf/41-community-lp-en-oct23.pdf>
- National Emergency Management Agency. (2024a). Earthquakes — Get Ready — Emergency preparedness in New Zealand. In.
- National Emergency Management Agency. (2024b). *Get involved - Āwhinatia*. <https://getready.govt.nz/en/involved>
- National Emergency Management Agency. (2024c). *Get prepared — Get Ready — Emergency preparedness in New Zealand*. <https://getready.govt.nz/prepared>
- National Emergency Management Agency. (2024d). *Get your community ready — Get Ready — Emergency preparedness in New Zealand*. <https://getready.govt.nz/en/involved/community>

- National Emergency Management Agency. (2024e). Home — Get Ready — Emergency preparedness in New Zealand. In.
- National Emergency Management Agency. (2024f). *Make a plan*. <https://getready.govt.nz/en/prepared/household/make-a-plan>
- National Emergency Management Agency. (2024g). National Public Education Programme » National Emergency Management Agency. In.
- National Emergency Management Agency. (2024h). *New Zealand Response Teams (NZ-RTs)*. <https://www.civildefence.govt.nz/cdem-sector/nz-rts-new-zealand-response-teams>
- National Emergency Management Agency. (2024i). New Zealand ShakeOut — Get Ready — Emergency preparedness in New Zealand. In.
- National Emergency Management Agency. (2024j). NZ-RTs (New Zealand Response Teams) » National Emergency Management Agency. In.
- National Emergency Management Agency. (2024k). Tsunami — Get Ready — Emergency preparedness in New Zealand. In.
- National Emergency Management Agency. (2024). Volunteering » National Emergency Management Agency. In.
- National Emergency Management Agency. (2024). *Get involved*. <https://getready.govt.nz/en/involved>
- Navarro de Corcuera, L., Barbero-Barrera, M. D. M., Campos Hidalgo, A., & Recio Martínez, J. (2021). Assessment of the adequacy of mobile applications for disaster reduction. *Environment, development and sustainability*, 1-27.
- Nazaruddin, M. (2020). Social media and alternative discourse on natural hazard: A case study of Facebook group Info Merapi. *Jurnal Komunikasi: Malaysian Journal of Communication*, 36(1), 480-494.
- Neely, S. R., & Collins, M. (2018). Social media and crisis communications: A survey of local governments in Florida. *Journal of Homeland Security and Emergency Management*, 15(1), 20160067.
- Neighbourhood Support New Zealand. (2024). Our Role in an Emergency or Disaster | Neighbourhood Support New Zealand. In.
- Nemeskey, D. M., & Kornai, A. (2018). Emergency vocabulary. *Information Systems Frontiers*, 20(5), 909-923.
- New Zealand Ministry of Civil Defence. *Civil Defence in New Zealand: A Short History*. <https://www.civildefence.govt.nz/assets/Uploads/documents/publications/reports/Short-History-of-Civil-Defence.pdf>
- Niiniluoto, I. (2002). Realism in Ontology. In I. Niiniluoto (Ed.), *Critical Scientific Realism*. Oxford University Press.

- Ning, N., Hu, M., Qiao, J., Liu, C., Zhao, X., Xu, W., Xu, W., Zheng, B., Chen, Z., & Yu, Y. (2021). Factors associated with individual emergency preparedness behaviors: a cross-sectional survey among the public in three Chinese Provinces. *Frontiers in Public Health, 9*, 644421.
- Nissen, S., Carlton, S., Wong, J. H., & Johnson, S. (2021). 'Spontaneous' volunteers? Factors enabling the Student Volunteer Army mobilisation following the Canterbury earthquakes, 2010–2011. *International Journal of Disaster Risk Reduction, 53*, 102008.
- Nkombi, Z., & Wentink, G. J. (2022). The role of public participation in disaster risk reduction initiatives: The case of Katlehong township. *Jàmbá-Journal of Disaster Risk Studies, 14*(1), 1203.
- Norricks, N. (2007). *Conversational storytelling* (Vol. 7).
- Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology, 41*, 127-150.
- Nova, K. (2023). Generative AI in healthcare: advancements in electronic health records, facilitating medical languages, and personalized patient care. *Journal of Advanced Analytics in Healthcare Management, 7*(1), 115-131.
- Nussbaum, M. (2006). Poverty and human functioning: Capabilities as fundamental entitlements. *Poverty and inequality, 1990*, 47-75.
- NZ Civil Defence. (2023). NZ Civil Defence. https://www.facebook.com/profile/100064939110574/search/?q=%22Are%20there%20people%20in%20your%20community%20who%20might%20need%20extra%20help%20in%20an%20emergency%22&locale=et_EE
- NZ Landcare Trust. (2024). *Projects Map*. <https://landcare.org.nz/regions-groups/projects-map/>
- O'Brien, G., & O'keefe, P. (2013). *Managing adaptation to climate risk: Beyond fragmented responses*. Routledge. <https://doi.org/https://doi.org/10.4324/9780203836910>
- Obregón, R., & Tufte, T. (2017). Communication, social movements, and collective action: Toward a new research agenda in communication for development and social change. In (Vol. 67, pp. 635-645): Oxford University Press.
- Odella, F. (2012). Social networks and communities: From traditional society to the virtual sphere. In *Social networking and community behavior modeling: Qualitative and quantitative measures* (pp. 1-25). IGI Global.
- Oktavianus, J., & Lin, W.-Y. (2022). Community storytelling networks and empowerment of migrant domestic workers: A communication infrastructure approach. *International Journal of Communication, 16*, 22.
- Oliver-Smith, A. (1996). Anthropological research on hazards and disasters. *Annual review of anthropology, 25*(1), 303-328.
- Onwuegbuzie, A. J., & Johnson, R. B. (2006). The validity issue in mixed research. *Research in the Schools, 13*(1), 48-63.

- Onwuegbuzie, A. J., & Johnson, R. B. (2021). *The Routledge reviewer's guide to mixed methods analysis*. Routledge.
- Orchiston, C. (2013). Tourism business preparedness, resilience and disaster planning in a region of high seismic risk: The case of the Southern Alps, New Zealand. *Current Issues in Tourism*, 16(5), 477-494.
- Oschatz, C., & Marker, C. (2020). Long-term persuasive effects in narrative communication research: A meta-analysis. *Journal of Communication*, 70(4), 473-496.
- Ossey, S., Sylvers, S., Oksuzyan, S., Smith, L. V., Frye, D., Family, L., Scott, J., & King, J. B. (2017). Community emergency response team (CERT) training of high-risk teens in the community of Watts, South Los Angeles, 2013–2014. *Disaster medicine and public health preparedness*, 11(5), 605-609.
- Ostrom, E. (2010). Analyzing collective action. *Agricultural economics*, 41, 155-166.
- Ostrower, F. (1998). Nonparticipant observation as an introduction to qualitative research. *Teaching Sociology*, 26(1), 57-61.
- Otago CDEM Group. (2024). Queenstown Lakes | Otago CDEM Group. In.
- Ozanne, J., & Ozanne, L. (2013). Developing local partners in emergency planning and management: Lyttleton time bank as a builder and mobiliser of resources during the Canterbury Earthquakes.
- Ozanne, L. K., & Ozanne, J. L. (2016). How alternative consumer markets can build community resiliency. *European Journal of Marketing*, 50(3/4), 330-357.
- Page-Tan, C. (2021). Bonding, bridging, and linking social capital and social media use: How hyperlocal social media platforms serve as a conduit to access and activate bridging and linking ties in a time of crisis. *Natural Hazards*, 105(2), 2219-2240.
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015a). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and policy in mental health and mental health services research*, 42, 533-544.
- Palinkas, L. A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N., & Hoagwood, K. (2015b). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and policy in mental health and mental health services research*, 42(5), 533-544.
- Pardo, N., Wilson, H., Procter, J. N., Lattughi, E., & Black, T. (2015). Bridging Māori indigenous knowledge and western geosciences to reduce social vulnerability in active volcanic regions. *Journal of Applied Volcanology*, 4, 1-20.
- Parida, D., Moses, S., & Rahaman, K. R. (2021). Analysing media framing of cyclone Amphan: Implications for risk communication and disaster preparedness. *International journal of disaster risk reduction*, 59, 102272.
- Patel, S. S., Rogers, M. B., Amlôt, R., & Rubin, G. J. (2017). What do we mean by 'community resilience'? A systematic literature review of how it is defined in the literature. *PLoS currents*, 9.

- Paton, D. (2008). Risk communication and natural hazard mitigation: how trust influences its effectiveness. *International Journal of Global Environmental Issues*, 8(1-2), 2-16.
- Paton, D. (2013). Disaster resilient communities: developing and testing an all-hazards theory. *IDRiM Journal*, 3(1), 1-17.
- Paton, D., Anderson, E., Becker, J., & Petersen, J. (2015). Developing a comprehensive model of hazard preparedness: lessons from the Christchurch earthquake. *International Journal of Disaster Risk Reduction*, 14, 37-45.
- Paton, D., Bajek, R., Okada, N., & Mclvor, D. (2010). Predicting community earthquake preparedness: a cross-cultural comparison of Japan and New Zealand. *Natural Hazards*, 54, 765-781.
- Paton, D., & Irons, M. (2016). Communication, sense of community, and disaster recovery: a Facebook case study. *Frontiers in communication*, 1, 4.
- Patton, M. Q. (2014). *Qualitative research & evaluation methods: Integrating theory and practice*. Sage publications.
- Paul, J. D., Buytaert, W., Allen, S., Ballesteros-Cánovas, J. A., Bhusal, J., Cieslik, K., Clark, J., Dugar, S., Hannah, D. M., & Stoffel, M. (2018). Citizen science for hydrological risk reduction and resilience building. *Wiley Interdisciplinary Reviews: Water*, 5(1), e1262.
- Paul, S., & Sosale, S. (2020). Witnessing a disaster: Public use of digital technologies in the 2015 South Indian floods. *Digital Journalism*, 8(1), 15-31.
- Paulik, R., Crowley, K., Cradock-Henry, N. A., Wilson, T. M., & McSporrán, A. (2021). Flood impacts on dairy farms in the Bay of Plenty Region, New Zealand. *Climate*, 9(2), 30.
- Payne, Y. A. (2017). Participatory action research. *The Wiley-Blackwell encyclopedia of social theory*, 1-15.
- Peeters, W., & Pretorius, M. (2020). Facebook or fail-book: Exploring “community” in a virtual community of practice. *ReCALL*, 32(3), 291-306.
- Pelling, M. (2007). Learning from others: the scope and challenges for participatory disaster risk assessment. *Disasters*, 31(4), 373-385.
- Perera, D., Agnihotri, J., Seidou, O., & Djalante, R. (2020). Identifying societal challenges in flood early warning systems. *International Journal of Disaster Risk Reduction*, 51, 101794.
- Perera, K., Tateishi, R., Akihiko, K., & Herath, S. (2021). A Combined Approach of Remote Sensing, GIS, and Social Media to Create and Disseminate Bushfire Warning Contents to Rural Australia. *Earth*, 2(4), 715-730.
- Pertiwi, P., Llewellyn, G., & Villeneuve, M. (2022). People with disabilities as key actors in community-based disaster risk reduction. *Disability & Society*, 34(9-10), 1419-1444.
- Petak, W. J. (1985). Emergency management: A challenge for public administration. *Public Administration Review*, 45, 3-7.

- Pfefferbaum, R. L., Neas, B. R., Pfefferbaum, B., Norris, F. H., & Van Horn, R. L. (2013). The Communities Advancing Resilience Toolkit (CART): development of a survey instrument to assess community resilience. *International journal of emergency mental health, 15*(1), 15-29.
- Pfefferbaum, R. L., Pfefferbaum, B., Van Horn, R. L., Klomp, R. W., Norris, F. H., & Reissman, D. B. (2013). The communities advancing resilience toolkit (CART): An intervention to build community resilience to disasters. *JOURNAL OF PUBLIC HEALTH MANAGEMENT AND PRACTICE, 19*(3), 250-258.
- Phibbs, S., Good, G., Severinsen, C., Woodbury, E., & Williamson, K. (2015). Emergency preparedness and perceptions of vulnerability among disabled people following the Christchurch earthquakes: Applying lessons learnt to the Hyogo Framework for Action. *Australasian Journal of Disaster and Trauma Studies, 19*, 37.
- Phibbs, S., Kenney, C., Severinsen, C., Mitchell, J., & Hughes, R. (2016). Synergising public health concepts with the Sendai framework for disaster risk reduction: A conceptual glossary. *International journal of environmental research and public health, 13*(12), 1241.
- Phibbs, S., Kenney, C., & Solomon, M. (2015). Ngā Mōwaho: An analysis of Māori responses to the Christchurch earthquakes. *Kōtuitui: New Zealand Journal of Social Sciences Online, 10*(2), 72-82.
- Piselli, F. (2007). Communities, places, and social networks. *American Behavioral Scientist, 50*(7), 867-878.
- Plano Clark, V., & Ivankova, N. (2016). How to assess mixed methods research. *Considering mixed methods research quality. Mixed Methods Research: A guide to the field, 161-188.*
- Plano Clark, V. L., Huddleston-Casas, C. A., Churchill, S. L., O'Neil Green, D., & Garrett, A. L. (2008). Mixed methods approaches in family science research. *Journal of Family Issues, 29*(11), 1543-1566.
- Plöger, J., & Becker, A. (2015). Social networks and local incorporation—Grounding high-skilled migrants in two German cities. *Journal of Ethnic and Migration Studies, 41*(10), 1517-1535.
- Plotnick, L., Hiltz, S. R., Kushma, J. A., & Tapia, A. H. (2015). Red Tape: Attitudes and Issues Related to Use of Social Media by US County-Level Emergency Managers. ISCRAM,
- Pogrebnyakov, N., & Maldonado, E. (2018). Didn't roger that: Social media message complexity and situational awareness of emergency responders. *International Journal of Information Management, 40*, 166-174.
- Pomeroy, A., & Holland, P. (2016). Secondary school student perspectives on community resilience in Grey District. *New Zealand Geographer, 72*(1), 57-68.
- Potter, S. H., Becker, J. S., Johnston, D. M., & Rossiter, K. P. (2015). An overview of the impacts of the 2010-2011 Canterbury earthquakes. *International Journal of Disaster Risk Reduction, 14*, 6-14.
- Potter, S. H., Kreft, P. V., Milojev, P., Noble, C., Montz, B., Dhellemmes, A., Woods, R. J., & Gauden-Ing, S. (2018). The influence of impact-based severe weather warnings on risk perceptions and intended protective actions. *International Journal of Disaster Risk Reduction, 30*, 34-43.

- Potter, S. H., Scott, B. J., Jolly, G. E., Neall, V. E., & Johnston, D. M. (2015). Introducing the Volcanic Unrest Index (VUI): a tool to quantify and communicate the intensity of volcanic unrest. *Bulletin of Volcanology*, *77*, 1-15.
- Power, W., Wallace, L., Mueller, C., Henrys, S., Clark, K., Fry, B., Wang, X., & Williams, C. (2016). Understanding the potential for tsunami generated by earthquakes on the southern Hikurangi subduction interface. *New Zealand Journal of Geology and Geophysics*, *59*(1), 70-85.
- Prior, T., & Paton, D. (2008). Understanding the context: The value of community engagement in bushfire risk communication and education. Observations following the East Coast Tasmania bushfires of December 2006. *Australasian Journal of Disaster and Trauma Studies*.
- Pstross, M., Talmage, C. A., & Knopf, R. C. (2017). A story about storytelling: Enhancement of community participation through catalytic storytelling. In *Rural Wealth Creation as a Sustainable Economic Development Strategy* (pp. 103-116). Routledge.
- Putnam, R. D. (2000a). Bowling alone: America's declining social capital. In *Culture and politics: A reader* (pp. 223-234). Springer.
- Putnam, R. D. (2000b). *Bowling alone: The collapse and revival of American community*. Simon and Schuster.
- Quarantelli, E. L. (1982). Sheltering and housing after major community disasters: case studies and general observations.
- Quarantelli, E. L. (1984). Emergent citizen groups in disaster preparedness and recovery activities.
- Quarantelli, E. L. (1990). Emergency.
- Quarantelli, E. L. (2003). A half century of social science disaster research: Selected major findings and their applicability.
- Que, T., Wu, Y., Hu, S., Cai, J., Jiang, N., & Xing, H. (2022). Factors influencing public participation in community disaster mitigation activities: A comparison of model and nonmodel disaster mitigation communities. *International journal of environmental research and public health*, *19*(19), 12278.
- Quinn, S. C. (2008). Crisis and Emergency Risk Communication in a Pandemic: A Model for Building Capacity and Resilience of Minority Communities [Article]. *Health Promotion Practice*, *9*, 18S-25S. <https://doi.org/10.1177/1524839908324022>
- Radford, T., & Wisner, B. (2012). Media, communication and disasters. In *Handbook of Hazards and Disaster Risk Reduction* (pp. 761-771). Routledge.
- Rasmussen, J., & Ihlen, Ø. (2017). Risk, crisis, and social media: A systematic review of seven years' research. *Nordicom Review*, *38*(2), 1-17.
- Ratcliff, C. L., & Sun, Y. (2020). Overcoming resistance through narratives: Findings from a meta-analytic review. *Human Communication Research*, *46*(4), 412-443.
- Rees, J. H., & Bamberg, S. (2014). Climate protection needs societal change: Determinants of intention to participate in collective climate action. *European Journal of Social Psychology*, *44*(5), 466-473.

- Reichel, C., & Frömming, U. U. (2014). Participatory mapping of local disaster risk reduction knowledge: An example from Switzerland. *International Journal of Disaster Risk Science*, 5, 41-54.
- Renn, O. (1992). Risk communication: Towards a rational discourse with the public. *Journal of hazardous materials*, 29(3), 465-519.
- Resilience to Nature's Challenges. (2024a). Co-creating Rural Disaster Risk Resilience - Resilience to Nature's Challenges. In.
- Resilience to Nature's Challenges. (2024b). Whanake te Kura i Tawhiti Nui – Resilience to Nature's Challenges. In.
- Reuter, C., Kaufhold, M.-A., Leopold, I., & Knipp, H. (2017). *Katwarn, NINA or FEMA? Multi-Method study on distribution, use and public views on crisis apps*. Association for Information Systems AIS.
- Reuter, C., & Kaufhold, M. A. (2018). Fifteen years of social media in emergencies: a retrospective review and future directions for crisis informatics. *Journal of contingencies and crisis management*, 26(1), 41-57.
- Reuter, C., Ludwig, T., Friberg, T., Pratzler-Wanczura, S., & Gizikis, A. (2015). Social media and emergency services?: Interview study on current and potential use in 7 European countries. *International Journal of Information Systems for Crisis Response and Management (IJISCRAM)*, 7(2), 36-58.
- Reynolds, B., & Seeger, M. W. (2005). Crisis and emergency risk communication as an integrative model. *Journal of Health Communication*, 10(1), 43-55.
- Rimal, R. N., & Real, K. (2003). Perceived risk and efficacy beliefs as motivators of change: Use of the risk perception attitude (RPA) framework to understand health behaviors. *Human communication research*, 29(3), 370-399.
- Rivera, F. I., Kapucu, N., & Hawkins, C. (2015). Rural community disaster resiliency: Self-organizing collective action among farmworkers in Central Florida. *International Journal of Mass Emergencies & Disasters*, 33(2), 213-227.
- Rnz. (2013). Tsunami Blue Lines Spectrum | RNZ. In.
- Robertson, B. (2003). *The Civil Defence Emergency Management Act 2002 and Civil Defence Volunteers: Information for Local Authorities*. <https://www.civildefence.govt.nz/assets/Uploads/documents/volunteering-resources/VolunteersandtheCDEMAct.pdf>
- Robertson, B. W., & Stephens, K. K. (2022). Communicating Disaster Preparedness: Combining Individual-and Community-Level Perspectives to Achieve more Lasting Resilience. *The Handbook of Crisis Communication*, 313-326.
- Rogers, E. M. (2004). A prospective and retrospective look at the diffusion model. *Journal of Health Communication*, 9(51), 13-19.
- Rogers, G. O., & Sorensen, J. H. (1988). Diffusion of emergency warnings. *Environmental Professional*, 10(4), 185-198.

- Rogers, P. (2015). Researching resilience: An agenda for change. *Resilience*, 3(1), 55-71.
- Rogers, P., Burnside-Lawry, J., Dragisic, J., & Mills, C. (2016). Collaboration and communication: Building a research agenda and way of working towards community disaster resilience. *Disaster Prevention and Management*.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change¹. *The journal of psychology*, 91(1), 93-114.
- Rohleder, P., & Lyons, A. C. (2014). *Qualitative research in clinical and health psychology*. Macmillan International Higher Education.
- Ronan, K. R., & Johnston, D. M. (2001). Correlates of hazard education programs for youth. *Risk analysis*, 21(6), 1055-1064.
- Ronan, K. R., Paton, D., Johnston, D. M., & Houghton, B. F. (2000). Managing societal uncertainty in volcanic hazards: a multidisciplinary approach. *Disaster Prevention and Management: An International Journal*, 9(5), 339-349.
- Rouse, H., Blackett, P., Hume, T., Bell, R., Britton, R., & Dahm, J. (2013). Coastal Adaptation to Climate Change: A New Zealand story. *Journal of Coastal Research*(65), 1957-1962.
- Rout, M., Awatere, S., Reid, J., Campbell, E., Huang, A., & Warmenhoven, T. (2024). A 'te ao Māori' disaster risk reduction framework. *Disasters*, e12622.
- Roy, A., Noy, I., & Cuffe, H. E. (2022). Income and extratropical cyclones in New Zealand. *Journal of Environmental Management*, 311, 114852.
- Rudkevitch, A. (2022). *Shaking ground and shifting collectives: Understanding community resilience in Kaikōura, Aotearoa New Zealand: A thesis submitted in partial fulfilment of the requirements for the Degree of Doctor of Philosophy at Lincoln University Lincoln University*].
- Ryan, B., Johnston, K. A., Taylor, M., & McAndrew, R. (2020). Community engagement for disaster preparedness: A systematic literature review. *International Journal of Disaster Risk Reduction*, 49, 101655.
- Ryan, E., Owen, S., Lawrence, J., Glavovic, B., Robichaux, L., Dickson, M., Kench, P., Schneider, P., Bell, R., & Blackett, P. (2022). Formulating a 100-year strategy for managing coastal hazard risk in a changing climate: Lessons learned from Hawke's Bay, New Zealand. *Environmental Science & Policy*, 127, 1-11.
- Sagala, S., Okada, N., & Paton, D. (2009). Predictors of intention to prepare for volcanic risks in Mt Merapi, Indonesia. *Journal of Pacific Rim Psychology*, 3(2), 47-54.
- Saldaña, J. (2016). *The coding manual for qualitative researchers*. sage.
- Saldaña, J. (2021). The coding manual for qualitative researchers. *The coding manual for qualitative researchers*, 1-440.
- Saldaña, M. (2022). Who is to blame? Analysis of government and news media frames during the 2014 earthquake in Chile. *Journalism Studies*, 23(1), 25-47.

- Samaddar, S., Choi, J., Misra, B. A., & Tatano, H. (2015). Insights on social learning and collaborative action plan development for disaster risk reduction: practicing Yonmenkaigi System Method (YSM) in flood-prone Mumbai. *Natural hazards*, 75, 1531-1554.
- Sapkota, L. M., Shrestha, R. P., Jourdain, D., & Shivakoti, G. P. (2015). Factors affecting collective action for forest fire management: A comparative study of community forest user groups in Central Siwalik, Nepal. *Environmental management*, 55(1), 171-186.
- Sauer, B. A. (2003). *The rhetoric of risk: Technical documentation in hazardous environments*. Routledge.
- Saunders, C., Dalziel, P., Reid, J., & McCallum, A. (2024). Knowledge, mātauranga and science: reflective learning from the interface. *Journal of the Royal Society of New Zealand*, 54(2), 207-228.
- Sawangnate, C., Chaisri, B., & Kittipongvises, S. (2022). Flood hazard mapping and flood preparedness literacy of the elderly population residing in Bangkok, Thailand. *Water*, 14(8), 1268.
- Sayers, E. L. P., Anthony, K. E., Tom, A., Kim, A. Y., & Armstrong, C. (2023). 'We will rise no matter what': community perspectives of disaster resilience following Hurricanes Irma and Maria in Puerto Rico. *Journal of Applied Communication Research*, 51(2), 126-145.
- Scanlon, J. (2011). Research about the mass media and disaster: Never (well hardly ever) the twain shall meet. *Journalism Theory and Practice*, 233-269.
- Schneider, P., Lawrence, J., Glavovic, B., Ryan, E., & Blackett, P. (2020). A rising tide of adaptation action: Comparing two coastal regions of Aotearoa-New Zealand. *Climate Risk Management*, 30, 100244.
- Schoch, K. (2020). Case study research. *Research Design and Methods: An Applied Guide for the Scholar-practitioner*, 245-258.
- Scott, E. F., & Dowrick, D. (1999). A report on the Relief Organisation in Hastings Arising out of the [magnitude 7.8] Earthquake in Hawke's Bay [New Zealand] on February 3, 1931. *Bulletin of the New Zealand Society for Earthquake Engineering*, 32(4), 246-256.
- Scott, K. K., & Errett, N. A. (2018). Content, accessibility, and dissemination of disaster information via social media during the 2016 Louisiana floods. *Journal of public health management and practice*, 24(4), 370-379.
- Seeger, M., & Sellnow, T. L. (2016). *Narratives of crisis: Telling stories of ruin and renewal*. Stanford University Press.
- Segerberg, A., & Bennett, W. L. (2011). Social media and the organization of collective action: Using Twitter to explore the ecologies of two climate change protests. *The Communication Review*, 14(3), 197-215.
- Sellnow, T. L., & Seeger, M. W. (2021). *Theorizing crisis communication*. John Wiley & Sons.
- Sellnow, T. L., Sellnow, D. D., Johansson, B., Lane, D. R., & Seeger, M. W. (2023). The IDEA model theoretical framework: An explication of risk communication as engaged public relations. In *Public relations theory III* (pp. 228-246). Routledge.

- Sellnow, T. L., Ulmer, R. R., Seeger, M. W., & Littlefield, R. (2008). *Effective risk communication: A message-centered approach*. Springer Science & Business Media.
- Selwyn District Council. (2024a). Selwyn District Council - Volunteer. In.
- Selwyn District Council. (2024b). *Volunteer*. <https://www.selwyn.govt.nz/services/civil-defence-And-emergency-management/community-response-volunteers>
- Semali, L. M., & Kincheloe, J. L. (2002). Introduction: What is indigenous knowledge and why should we study it? In *What is indigenous knowledge?* (pp. 3-57). Routledge.
- Sen, A. (1999). *Commodities and Capabilities: Amartya Sen*. Oxford University Press.
- Servaes, J. (2022). Communication for development and social change. In *The Routledge handbook of nonprofit communication* (pp. 23-31). Routledge.
- Servaes, J., & Malikhao, P. (2008). Development communication approaches in an international perspective. *Communication for development and social change*, 158.
- Servaes, L., & Servaes, J. (2021). Participatory communication for social change. In *Handbook of communication and development* (pp. 120-141). Edward Elgar Publishing.
- Seyranian, V., Sinatra, G. M., & Polikoff, M. S. (2015). Comparing communication strategies for reducing residential water consumption. *Journal of Environmental Psychology*, 41, 81-90.
- Shanahan, E. A., Reinhold, A. M., Raile, E. D., Poole, G. C., Ready, R. C., Izurieta, C., McEvoy, J., Bergmann, N. T., & King, H. (2019). Characters matter: How narratives shape affective responses to risk communication. *PLoS ONE*, 14(12), e0225968.
- Shanks, K. (2023). Edgecumbe one year on: Generosity overwhelming. <https://www.nzherald.co.nz/rotorua-daily-post/news/edgecumbe-one-year-on-generosity-of-country-overwhelming/ERUXFWHAFZ5YLQAN7FZNZ7VBGI/>
- Sharpe, J. (2021a). Learning to trust: Relational spaces and transformative learning for disaster risk reduction across citizen led and professional contexts [Article]. *International Journal of Disaster Risk Reduction*, 61. <https://doi.org/10.1016/j.ijdr.2021.102354>
- Sharpe, J. (2021b). Learning to trust: Relational spaces and transformative learning for disaster risk reduction across citizen led and professional contexts. *International Journal of Disaster Risk Reduction*, 61, 102354.
- Sharpe, M. (2020). Alert system trial for big swells on Wellington's south coast. *Stuff*. <https://www.stuff.co.nz/dominion-post/news/wellington/300003507/alert-system-trial-for-big-swells-on-wellingtons-south-coast>
- Shaw, R. (2012). *Community based disaster risk reduction*. Emerald Group Publishing.
- Shen, F., & Edwards, H. H. (2023). Narratives in Public Communication: An Introduction. In *Narratives in Public Communication* (pp. 1-9). Routledge.
- Sherman-Morris, K., Houston, J. B., & Subedi, J. (2021). Theoretical matters: On the need for hazard and disaster theory developed through interdisciplinary research and collaboration. *Risk analysis*, 41(7), 1059-1065.

- Simpson, D. M. (2000). Non-institutional sources of assistance following a disaster: Potential triage and treatment capabilities of neighborhood-based preparedness organizations. *Prehospital and disaster medicine*, 15(4), 73-80.
- Sinner, J., Tadaki, M., Mccarthy, A., Challies, E., & Thomson-Laing, J. (2022). *Catchment And Community Environment Groups In Aotearoa New Zealand: Goals, Activities And Needs*
<https://environment.govt.nz/assets/publications/catchment-and-community-environment-groups-in-Aotearoa.pdf>
- Skamagki, G., King, A., Carpenter, C., & Wåhlin, C. (2022). The concept of integration in mixed methods research: a step-by-step guide using an example study in physiotherapy. *Physiotherapy Theory and Practice*, 1-8.
- Smart, G. M., & McKerchar, A. I. (2010). More flood disasters in New Zealand. *Journal of Hydrology (New Zealand)*, 49(2), 69-78.
- Smith, E. A. (2010). Communication and collective action: language and the evolution of human cooperation. *Evolution and human behavior*, 31(4), 231-245.
- Smith, L. T. (2019). *Decolonizing research: Indigenous storywork as methodology*. Bloomsbury Publishing.
- SocialMedia.org.nz. (2023). *NZ Social Media Statistics 2023*. <https://socialmedia.org.nz/nz-social-media-statistics-2018/>
- Solberg, C., Rossetto, T., & Joffe, H. (2010). The social psychology of seismic hazard adjustment: re-evaluating the international literature. *Natural hazards and earth system sciences*, 10(8), 1663-1677.
- Solinska-Nowak, A., Magnuszewski, P., Curl, M., French, A., Keating, A., Mochizuki, J., Liu, W., Mechler, R., Kulakowska, M., & Jarzabek, L. (2018). An overview of serious games for disaster risk management—Prospects and limitations for informing actions to arrest increasing risk. *International journal of disaster risk reduction*, 31, 1013-1029.
- South Dunedin Community Network. (2024). *Our story - South Dunedin Community Network*. <https://www.southd.org.nz/our-story/>
- Southland Civil Defence Emergency Management Group. (2017). Southland Civil Defence Emergency Management Group Plan. <https://cdsouthland.nz/media/2zqaln5f/2017-southland-group-plan-update-2019-1.pdf>
- Spector, S., Cradock-Henry, N. A., Beaven, S., & Orchiston, C. (2019). Characterising rural resilience in Aotearoa-New Zealand: a systematic review. *Regional Environmental Change*, 19, 543-557.
- Spialek, M. L., Czapinski, H. M., & Houston, J. B. (2016). Disaster communication ecology and community resilience perceptions following the 2013 central Illinois tornadoes. *International Journal of Disaster Risk Reduction*, 17, 154-160.
- Spialek, M. L., & Houston, J. B. (2018). The development and initial validation of the citizen disaster communication assessment. *Communication Research*, 45(6), 934-955.

- Spialek, M. L., & Houston, J. B. (2019). The influence of citizen disaster communication on perceptions of neighborhood belonging and community resilience. *Journal of Applied Communication Research*, 47(1), 1-23.
- St Denis, L. A., Hughes, A. L., & Palen, L. (2012). Trial by fire: The deployment of trusted digital volunteers in the 2011 shadow lake fire. Proceedings of the 9th International ISCRAM Conference,
- Stake, R. E. (1995). *The art of case study research*. sage.
- Stake, R. E. (2010). Qualitative research: Studying how things work.
- Stake, R. E. (2013). *Multiple case study analysis*. Guilford press.
- Stallings, R. A., & Quarantelli, E. L. (1985). Emergent citizen groups and emergency management. *Public Administration Review*, 45, 93-100.
- Stark, A., & Taylor, M. (2014). Citizen participation, community resilience and crisis-management policy. *Australian Journal of Political Science*, 49(2), 300-315.
- Stephens, K. K., Powers, C. J., Robertson, B. W., Spearing, L. A., Collier, J. C., Tich, K. P., & Smith, W. R. (2022). Building more resilient communities with a wildfire preparedness drill in the US: Individual and community influences and communication practices. *Journal of contingencies and crisis management*.
- Stieglitz, S., Mirbabaie, M., & Milde, M. (2018). Social positions and collective sense-making in crisis communication. *International Journal of Human-Computer Interaction*, 34(4), 328-355.
- Stone, J., Barclay, J., Simmons, P., Cole, P. D., Loughlin, S. C., Ramón, P., & Mothes, P. (2014). Risk reduction through community-based monitoring: the vigías of Tungurahua, Ecuador. *Journal of Applied Volcanology*, 3(1), 1-14.
- Story, W. T., Tura, H., Rubin, J., Engidawork, B., Ahmed, A., Jundi, F., Iddosa, T., & Abrha, T. H. (2020). Social capital and disaster preparedness in Oromia, Ethiopia: An evaluation of the "Women Empowered" approach. *Social Science & Medicine*, 257, 111907.
- Strasser, B., Baudry, J., Mahr, D., Sanchez, G., & Tancoigne, E. (2019). " Citizen science"? Rethinking science and public participation. *Science & Technology Studies*, 32(ARTICLE), 52-76.
- Streck, D. R. (2014). Knowledge and transformative social action: the encounter of selected traditions of participatory (action) research. *Globalisation, Societies and Education*, 12(4), 457-473.
- Sultan, S. N., & Maharjan, K. L. (2022). Cyclone-induced disaster loss reduction by social media: a case study on Cyclone Amphan in Koyra Upazila, Khulna District, Bangladesh. *Sustainability (Switzerland)*, 14(21), 13909.
- Sutton, J., & Tierney, K. (2006). Disaster preparedness: Concepts, guidance, and research. *Colorado: University of Colorado*, 3, 1-41.
- Sutton, J., & Veil, S. R. (2017). Risk communication and social media. In *Risk conundrums* (pp. 96-111). Routledge.

- Takeuchi, Y., Xu, W., Kajitani, Y., & Okada, N. (2012). Investigating Risk Communication Process for Community's Disaster Reduction with a Framework of "Communicative Survey Method". *Journal of Natural Disaster Science*, 33(1), 49-58.
- Tampere, P., Tampere, K., & Luoma-Aho, V. (2016). Facebook discussion of a crisis: Authority communication and its relationship to citizens. *Corporate Communications: An International Journal*, 21(4), 414-434.
- Tan, M. L., Hoffmann, D., Ebert, E., Cui, A., & Johnston, D. (2022). Exploring the potential role of citizen science in the warning value chain for high impact weather. *Frontiers in communication*, 7, 949949.
- Tan, M. L., Prasanna, R., Stock, K., Hudson-Doyle, E., Leonard, G., & Johnston, D. (2017). Mobile applications in crisis informatics literature: A systematic review. *International Journal of Disaster Risk Reduction*, 24, 297-311.
- Tang, Z., Zhang, L., Xu, F., & Vo, H. (2015). Examining the role of social media in California's drought risk management in 2014. *Natural Hazards*, 79, 171-193.
- Tansey, J., & Rayner, S. (2020). Cultural theory and risk. In *Handbook of risk and crisis communication* (pp. 53-79). Routledge.
- Tashakkori, A. (2020). Paradigm Issues in Mixed Methods Research. In A. Tashakkori, R. B. Johnson, & C. Teddlie (Eds.), *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage publications.
- Tashakkori, A., & Creswell, J. W. (2008). Mixed methodology across disciplines. In (Vol. 2, pp. 3-6): Sage Publications Sage CA: Los Angeles, CA.
- Tashakkori, A., Johnson, R. B., & Teddlie, C. (2020). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage publications.
- Tashakkori, A., Teddlie, C., & Teddlie, C. B. (1998). *Mixed methodology: Combining qualitative and quantitative approaches* (Vol. 46). sage.
- Tavares, L. P., Luís, S., Henriques, J., Marujo, H. Á., Gonçalves, S. P., & Rivero, C. (2023). Responding to everyday problems and crises: Measuring community resilience. *Journal of Community Psychology*, 51(4), 1560-1570.
- Taylor, B., Sinha, G., & Ghoshal, T. (2006). *Research methodology: A guide to for reseachers in management and social sciences*. PHI Learning Pvt. Ltd.
- Taylor, M. (2018). Reconceptualizing public relations in an engaged society. *The handbook of communication engagement*, 103-114.
- Teddlie, C., & Tashakkori, A. (2009a). Chapter 5, 'Paradigm Issues in Mixed Methods Research. In A. T. Charles Teddlie (Ed.), *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*. Sage publications.

- Teddlie, C., & Tashakkori, A. (2009b). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage.
- Thomas, K.-L., Kaiser, L., Campbell, E., Johnston, D., Campbell, H., Solomon, R., Jack, H., Borrero, J., & Northern, A. (2020). Disaster memorial events for increasing awareness and preparedness: 150 years since the Arica tsunami in Aotearoa-New Zealand. *Australian Journal of Emergency Management, The*, 35(3), 71-78.
- Thompson, M. A., Lindsay, J. M., & Gaillard, J.-C. (2015). The influence of probabilistic volcanic hazard map properties on hazard communication. *Journal of Applied Volcanology*, 4, 1-24.
- Thornley, L., Ball, J., Signal, L., Lawson-Te Aho, K., & Rawson, E. (2015). Building community resilience: learning from the Canterbury earthquakes. *Kōtuitui: New Zealand Journal of Social Sciences Online*, 10(1), 23-35.
- Tidball, K. G., & Krasny, M. E. (2007). From risk to resilience: What role for community greening and civic ecology in cities? In *Social learning towards a sustainable world* (pp. 149-164). Wageningen Academic.
- Tierney, K. (2020). *The social roots of risk: Producing disasters, promoting resilience*. Stanford University Press.
- Tight, M. (2019). *Documentary research in the social sciences*. Sage.
- Tonnies, F., & Loomis, C. P. (2017). *Community and society*. Routledge.
- Tran, M., & Kim, D. (2023). Co-production revisited: from knowledge plurality to action for disaster risk reduction. *Disaster Prevention and Management: An International Journal*.
- Tran, P., Shaw, R., Chantry, G., & Norton, J. (2009). GIS and local knowledge in disaster management: a case study of flood risk mapping in Viet Nam. *Disasters*, 33(1), 152-169.
- Tran, V. (2023). *A narrative inquiry into Vietnamese migrants' experiences of disaster risk reduction* [Open Access Te Herenga Waka-Victoria University of Wellington].
- Trần, V., & Blake, D. (2024). Vietnamese Migrants' Engagement in Disaster Risk Reduction: The Relevance of Social Capital. *International Journal of Disaster Risk Reduction*, 104879.
- Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *science*, 185(4157), 1124-1131.
- Tversky, A., Kahneman, D., & Slovic, P. (1982). *Judgment under uncertainty: Heuristics and biases*. Cambridge.
- Twigger-Ross, C., Orr, P., Brooks, K., & Saduaskis, R. (2016). Citizen involvement in flood risk governance: Flood groups and networks. E3S Web of Conferences,
- Uekusa, S. (2020). The paradox of social capital: A case of immigrants, refugees and linguistic minorities in the Canterbury and Tohoku disasters. *International Journal of Disaster Risk Reduction*, 48, 101625.

- Uekusa, S., & Cretney, R. (2022). Rethinking community resilience: Critical reflections on the last 10 years of the Ōtautahi Christchurch recovery and on-going disasters. In *A Decade of Disaster Experiences in Ōtautahi Christchurch: Critical Disaster Studies Perspectives* (pp. 125-141). Springer.
- Uekusa, S., & Matthewman, S. (2023). Preparing multilingual disaster communication for the crises of tomorrow: A conceptual discussion. *International Journal of Disaster Risk Reduction*, 87, 103589.
- Uekusa, S., Matthewman, S., & Lorenz, D. F. (2022). Conceptualising disaster social capital: what it is, why it matters, and how it can be enhanced. *Disasters*, 46(1), 56-79.
- Uekusa, S., Wynyard, M., & Matthewman, S. (2024). Reinvestigating social vulnerability from the perspective of Critical Disaster Studies (CDS): directions, opportunities and challenges in Aotearoa disaster research. *Kōtuitui: New Zealand Journal of Social Sciences Online*, 1-18.
- United Nations Office for Disaster Risk Reduction (UNDRR). 2017. The Sendai Framework Terminology on Disaster Risk Reduction. <https://www.undrr.org/terminology/>
- UNDRR. (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030*. <https://www.undrr.org/media/16176/download?startDownload=20240822>
- UNISDR. (2005). *Hyogo framework for action 2005–2015: Building the resilience of nations and communities to disasters*. <https://www.unisdr.org/2005/wcdr/intergover/official-doc/L-docs/Hyogo-framework-for-action-english.pdf>
- United Nations. (1994). *Yokohama Strategy and Plan of Action for a Safer World: guidelines for natural disaster prevention, preparedness and mitigation*. https://www.preventionweb.net/files/8241_doc6841contenido1.pdf
- United Nations. (1999). *International Decade for Natural Disaster Reduction Proceedings of the Programme Forum*. http://www.unisdr.org/files/31468_programmeforumproceedings.pdf
- United Nations International Strategy for Disaster Reduction. (2009). *2009 UNISDR terminology on disaster risk reduction*. U. Nations. https://www.preventionweb.net/files/7817_UNISDRTerminologyEnglish.pdf
- Unruh, J. D., & Abdul-Jalil, M. A. (2014). Constituencies of conflict and opportunity: Land rights, narratives and collective action in Darfur. *Political Geography*, 42, 104-116.
- Uscher-Pines, L., Chandra, A., & Acosta, J. (2013). Household Preparedness Is Not Enough. *Journal of public health management and practice*, 19, S70-S76.
- Vallance, S. (2015). Disaster recovery as participation: lessons from the Shaky Isles. *Natural Hazards*, 75, 1287-1301.
- Vallance, S., & Rudkevitch, A. (2021). Post-disaster recovery and social capital. In *Oxford Research Encyclopedia of Global Public Health*.
- van Gorp, A. F., Pogrebnyakov, N., & Maldonado, E. A. (2015). Just keep tweeting: Emergency responder's social media use before and during emergencies. In *ECIS 2015 Proceedings* (pp. 191). Association for Information Systems. AIS Electronic Library (AISeL).

- Van Laer, T., De Ruyter, K., Visconti, L. M., & Wetzels, M. (2014). The extended transportation-imagery model: A meta-analysis of the antecedents and consequences of consumers' narrative transportation. *Journal of Consumer research*, 40(5), 797-817.
- Van Manen, S., Avard, G., & Martinez-Cruz, M. (2015). Co-ideation of disaster preparedness strategies through a participatory design approach: Challenges and opportunities experienced at Turrialba volcano, Costa Rica. *Design Studies*, 40, 218-245.
- Van Zomeren, M. (2013). Four core social-psychological motivations to undertake collective action. *Social and Personality Psychology Compass*, 7(6), 378-388.
- Van Zomeren, M., Postmes, T., & Spears, R. (2008). Toward an integrative social identity model of collective action: a quantitative research synthesis of three socio-psychological perspectives. *Psychological bulletin*, 134(4), 504.
- Vázquez, L. P., Eshun, E. A., & Houston, J. B. (2024). Community Disaster Resilience and Communication: Models, Existing Research, and Next Steps. In *Routledge Handbook of Risk, Crisis, and Disaster Communication* (pp. 146-161). Routledge.
- Veil, S. R., Buehner, T., & Palenchar, M. J. (2011). A work-in-process literature review: Incorporating social media in risk and crisis communication. *Journal of contingencies and crisis management*, 19(2), 110-122.
- Velotti, L., & Murphy, P. (2020). Service and value co-production and co-creation in emergency services and emergency management. *International Journal of Emergency Services*, 9(1), 1-7.
- Victoria, L. (2009). Community capacity and disaster resilience. Disaster management: global challenges and local solutions. In: University Press, Hyderabad, India.
- Victoria, L. P. (2003). Community-based disaster management in the Philippines: Making a difference in people's lives. *Philippine Sociological Review*, 51, 65-80.
- Vinnell, L. (2020). *Why do people prepare for natural hazards? An application of the Theory of Planned Behaviour to household preparation* Open Access Te Herenga Waka-Victoria University of Wellington].
- Vinnell, L., Becker, J. S., Scolobig, A., Johnston, D. M., Tan, M., & McLaren, L. (2021). Citizen science initiatives in high-impact weather and disaster risk reduction. *Australasian Journal of Disaster and Trauma Studies*, 25(3), 55-60.
- Vinnell, L. J., Hudson-Doyle, E. E., Inch, P., Tan, M. L., Becker, J. S., & Johnston, D. M. (2022). Evacuation behavior and information needs of Wellington, Aotearoa New Zealand residents following the 5 March 2021 Mw 7.3 East Cape earthquake. *Seismological Research Letters*, 93(3), 1452-1463.
- Vinnell, L. J., Milfont, T. L., & McClure, J. (2019). Do social norms affect support for earthquake-strengthening legislation? Comparing the effects of descriptive and injunctive norms. *Environment and Behavior*, 51(4), 376-400.
- Wallerstein, N. B., & Duran, B. (2006). Using community-based participatory research to address health disparities. *Health Promotion Practice*, 7(3), 312-323.

- Walsh, D., & Downe, S. (2006). Appraising the quality of qualitative research. *Midwifery*, 22(2), 108-119.
- Walwema, J. (2021). Rhetoric and Cape Town's campaign to defeat Day Zero. *Journal of Technical Writing and Communication*, 51(2), 103-136.
- Wardman, J. K. (2008). The constitution of risk communication in advanced liberal societies. *Risk Analysis: An International Journal*, 28(6), 1619-1637.
- Warner, J. F., & Meissner, R. (2021). Cape Town's "Day Zero" water crisis: A manufactured media event? *International Journal of Disaster Risk Reduction*, 64, 102481.
- Wasserman, S., & Faust, K. (1994). *Social network analysis: Methods and applications*.
- Weaver, K. (2018). Pragmatic Paradigm. In B. B. Frey (Ed.), *The SAGE encyclopedia of educational research, measurement, and evaluation*. Sage publications.
- Wei, H.-L., Wu, H.-C., Lindell, M. K., Prater, C. S., Shiroshita, H., Johnston, D. M., & Becker, J. S. (2017). Assessment of households' responses to the tsunami threat: A comparative study of Japan and New Zealand. *International Journal of Disaster Risk Reduction*, 25, 274-282.
- Wellington Region Emergency Management Office. (2013). Working with Social Agencies to Support Vulnerable Communities. In.
- Wellington Region Emergency Management Office. (2024a). *Community Emergency Hubs*. <https://www.wremo.nz/get-ready/community-ready/community-emergency-hubs/>
- Wellington Region Emergency Management Office. (2024b). Continuity Planning Workshop for Community Groups - Upper Hutt. In.
- Wellington Region Emergency Management Office. (2024c). *Meet your neighbours*. <https://www.wremo.nz/get-ready/home-ready/meet-your-neighbours/>
- Wenger, E. (1998). Communities of practice: Learning as a social system. *Systems thinker*, 9(5), 2-3.
- Wertz, R. J. (2014). Johnny Saldaña. The coding manual for qualitative researchers. *Journal of Communications Media Studies*, 6(1), 128-130.
- West Coast Civil Defence Emergency Management Group. (2024). *Know Your Neighbours*. <https://westcoastemergency.govt.nz/community/know-your-neighbours/>
- Whybark, D. C. (2015). Co-creation of improved quality in disaster response and recovery. *International Journal of Quality Innovation*, 1, 1-10.
- Williams, M. V., Chandra, A., Spears, A., Varda, D., Wells, K. B., Plough, A. L., & Eisenman, D. P. (2018). Evaluating community partnerships addressing community resilience in Los Angeles, California. *International journal of environmental research and public health*, 15(4), 610.
- Willis, G. (2014). Managing natural hazard risk in New Zealand—Towards more resilient Communities. *LGNZ and Regional Councils: Wellington, New Zealand*.
- Wolfe, A. (2013). Network Perspective on Structures Related to Communities. In *Small and Medium Enterprises: Concepts, Methodologies, Tools, and Applications* (pp. 1384-1407). IGI Global.

- Wood, M. M., Miletic, D. S., Kano, M., Kelley, M. M., Regan, R., & Bourque, L. B. (2012). Communicating actionable risk for terrorism and other hazards*. *Risk Analysis: An International Journal*, 32(4), 601-615.
- WREMO. (2023). *Community Emergency Hubs*. <https://www.wremo.nz/get-ready/community-ready/community-emergency-hubs/>
- Wright, S. C. (2009). The next generation of collective action research. *Journal of social Issues*, 65(4), 859-879.
- Wu, W.-N. (2020). Disaster-Resistant Community: An examination of developmental differences. *Natural Hazards*, 101(1), 125-142.
- Wu, W.-N., Chang, K., & Tso, Y.-E. (2016). If only we knew what we know: Factors for mobilizing citizen participation in community-based emergency preparedness. *Chinese Public Administration Review*, 7(1), 77-109.
- Wukich, C. (2016). Government social media messages across disaster phases. *Journal of contingencies and crisis management*, 24(4), 230-243.
- Wukich, C. (2020). More monitoring, less coordination: Twitter and Facebook use between emergency management agencies. *Journal of Homeland Security and Emergency Management*, 17(3), 20200007.
- Wulf, V., Misaki, K., Atam, M., Randall, D., & Rohde, M. (2013). 'On the ground'in Sidi Bouzid: investigating social media use during the Tunisian revolution. Proceedings of the 2013 conference on Computer supported cooperative work,
- Yadav, D. (2022). Criteria for good qualitative research: A comprehensive review. *The Asia-Pacific Education Researcher*, 31(6), 679-689.
- Yan, L., & Pedraza-Martinez, A. J. (2019). Social media for disaster management: Operational value of the social conversation. *Production and Operations Management*, 28(10), 2514-2532.
- Yazan, B. (2015). Three approaches to case study methods in education: Yin, Merriam, and Stake. *The qualitative report*, 20(2), 134-152.
- Yin, R. K. (2009). *Case study research: Design and methods* (Vol. 5). sage.
- Yin, R. K. (2018). Case study research and Applications Design and methods.
- Yuanjaya, P., & Fajri, H. (2020). The collective action of urban communities in disaster risk reduction: A case study in Yogyakarta City. IOP Conference Series: Earth and Environmental Science,
- Zhang, X., Yi, L., & Zhao, D. (2013). Community-based disaster management: a review of progress in China. *Natural Hazards*, 65, 2215-2239.
- Zhu, J., & Lejano, R. P. (2024). A Relational Approach to Risk Communication. In *Oxford Research Encyclopedia of Natural Hazard Science*.
- Zivari, F., Feshari, M., Motamedi, A., & Valibeigi, M. (2019). How to improve public participation in disaster risk management: A case study of Buein Zahra, a small city in Iran. *Jàmbá: Journal of Disaster Risk Studies*, 11(1), 1-9.

Živković, V., & Heikell, V.-A. (2022). Harnessing indigenous knowledge in disaster risk management in Aotearoa New Zealand. *Libellarium: časopis za istraživanja u području informacijskih i srodnih znanosti*, 13(1), 31-44.