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CHILDREN WITH DISABILITIES AND DISASTER RISK REDUCTION IN NEW ZEALAND

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Abstract

The global rise in the number of disasters is largely due to the interplay between environmental and human factors. Children and especially children with disabilities are disproportionately impacted by disasters, with an estimated seven million children affected worldwide annually. Children with disabilities can have increased vulnerabilities because of mobility difficulties, pre-existing medical conditions, existing socio-economic barriers and policies that fail to recognise the diverse needs of this group. Indeed, researchers and practitioners have historically overlooked the experiences and needs of children, particularly so for those with disabilities, who are disproportionately affected by natural hazards and disasters. Their capacities, needs, and, importantly, potential roles in disaster risk reduction (DRR) have received little consideration from researchers and policy makers.

This thesis draws on the findings of a multi-case study of three New Zealand schools working with children having diverse disabilities. The schools are in the regions of Canterbury, Hawke's Bay and Auckland. It aims to generate new information to help inform DRR and give direction, and provide a holistic framework towards the development of an inclusive approach to DRR. This orientation aims to specifically integrate the experiences, perspectives and needs of children with disabilities. Although grounded in disaster studies, this thesis frequently draws upon the wider scholarship related to children, participatory approaches and disability. The central goal of the study is to assess and interpret the experiences of children with disabilities in dealing with natural hazards, and to identify their actual and potential contribution to DRR. It presents the use of flexible participatory tools which support a sustained continuum of engagement among children with diverse disabilities, skills, and experiences. Crucially, this work offers a bridge and conceptual framework that recognises communication as a two-way process between adults and children by requiring adults to learn how children express their views, thus according participants a voice in DRR research.

The case studies reveal considerable variation on how children with disabilities access available resources, and how they perceive, face and cope with natural hazards. The research also identifies constraints and complexities towards achieving disability-inclusive DRR and shows that ideas about DRR are shaped and influenced by socio-economic structures. Based on the participants' existing variation of potential vulnerabilities and capacities (individual and group) and their potential contribution in DRR, the thesis offers suggestions for policy and practice of a more inclusive approach to DRR. It emphasises the need to direct resources and programmes that facilitate and strengthen effective communication between adults and children to encourage sustained participation along children's spectrum of abilities. Finally, the thesis recommends a framework incorporating a shift in attitude to children with disabilities as integral and active participants in DRR.

Acknowledgements

First, I would like to acknowledge the funding and support of the University of Auckland, and of The Earthquake Commission of New Zealand (EQC) through its Post-Graduate Grants Programme. I would also like to acknowledge and express appreciation for the willingness and contribution of the Hawke's Bay, Auckland and the Christchurch schools, and the children and the adult participants there. I would also like to thank representatives from New Zealand Red Cross, the District Health Boards and the Civil Defence Emergency Management (CDEM) in each of the three regions. They took time out of their busy schedules to participate in the semi-structured interviews. I hope the findings will help inform policy and practice for a more inclusive approach to disaster risk reduction (DRR) in schools that integrate the experiences, perspectives and needs of children with disabilities.

I am grateful to my main supervisor Associate Professor JC Gaillard (The School of Environment) and Co-Supervisor Associate Professor Jay Marlowe (The School of Education and Social Work). With my teaching background, JC Gaillard encouraged me to work with schools that support children with disabilities for my PhD research and helped expedite my enrolment. He provided fast feedback and infectious positive energy vital for the duration of the research process. I am very grateful to Jay Marlowe who took a keen interest in the topic, and for providing clarity, calmness and sound guidance throughout the PhD journey. He spent many hours providing detailed reviews of my work. Through the assistance of my supervisors, I was able to undertake a number of conference speaking opportunities, journal submissions and to obtain invaluable professional contacts.

I would like to express special thanks to my wife Jane. You provided enduring support for our family and became a source of hope, love, and laughter throughout the successes and challenges of my PhD research. My daughter Elsie and teenage son Kevin added a distinct flavour to the intrigues of the research journey. Thank you for being there for your dad.

I wish to particularly acknowledge and thank Editwrite proofreading services for the professional proofreading provided, and my colleague Joyce Sy for her help with maps and formatting of the thesis. To the many amazing friends, family members and colleagues that I have not explicitly named, I am grateful. This study has been constructed on your shoulders.

Dedication

I would like to dedicate this thesis to my mother and father, who, despite not having had the opportunity for formal education themselves, provided consistent support throughout my entire education. My Dad's incessant love and determination to champion the cause of formal education for both boys and girls in society saw him selected to become the Board chair of my former primary school. He became a source of support and unrelenting encouragement who inspired not only a love for learning within the family, but in the wider school community as a whole. Thank you, Dad, for your inspiration.

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Co-authorship forms B: Ronoh S., Gaillard J.C., and Marlowe, J. (2017). Bridging the Participatory Gap: Children with disabilities and Disaster Risk Reduction. *International Journal of Mass Emergencies and Disasters (In press).*

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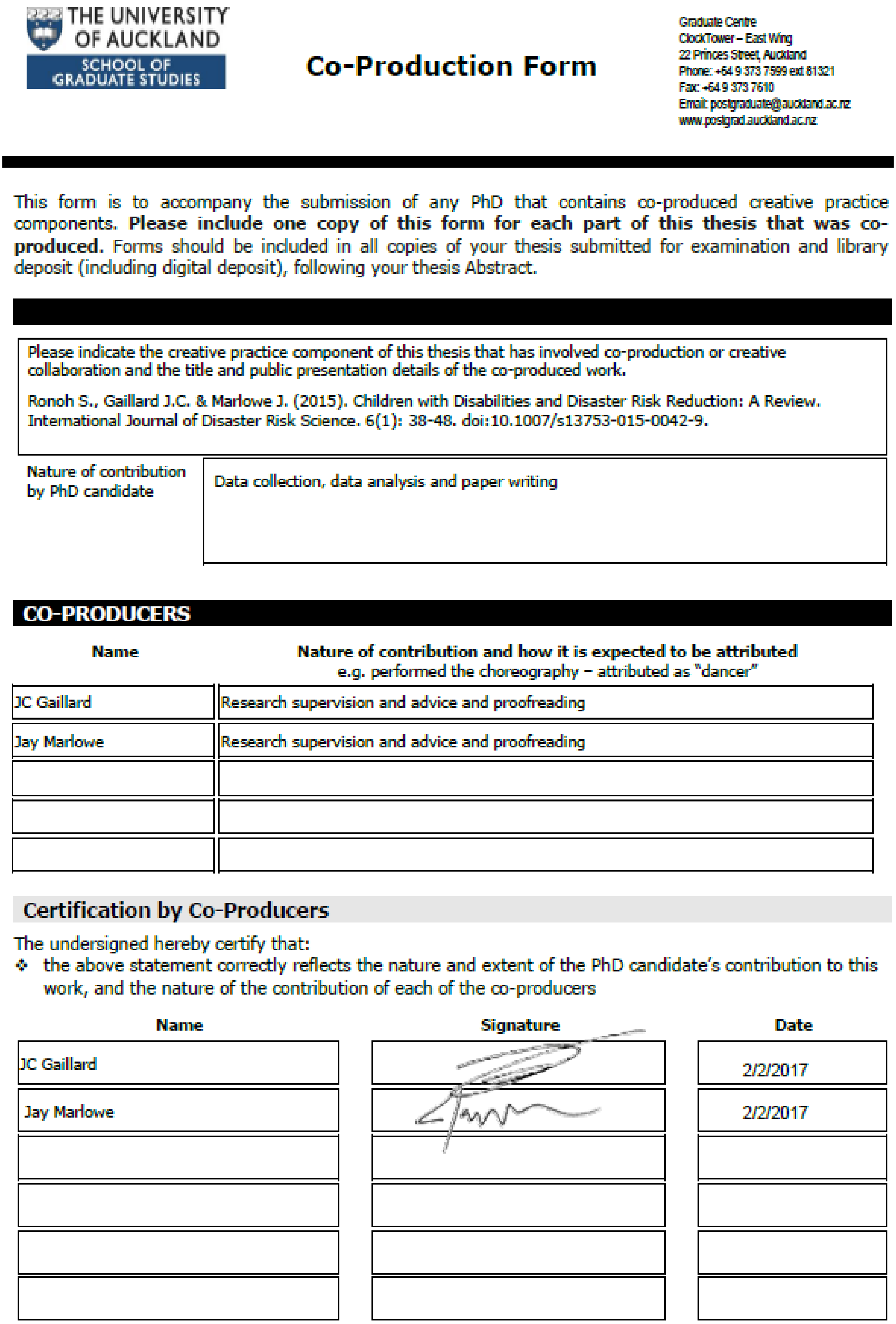

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Nature of contribution by PhD candidate	Data collection, data analysis and paper writing

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JC Gaillard	Research supervision and advice and proofreading
Jay Marlowe	Research supervision and advice and proofreading

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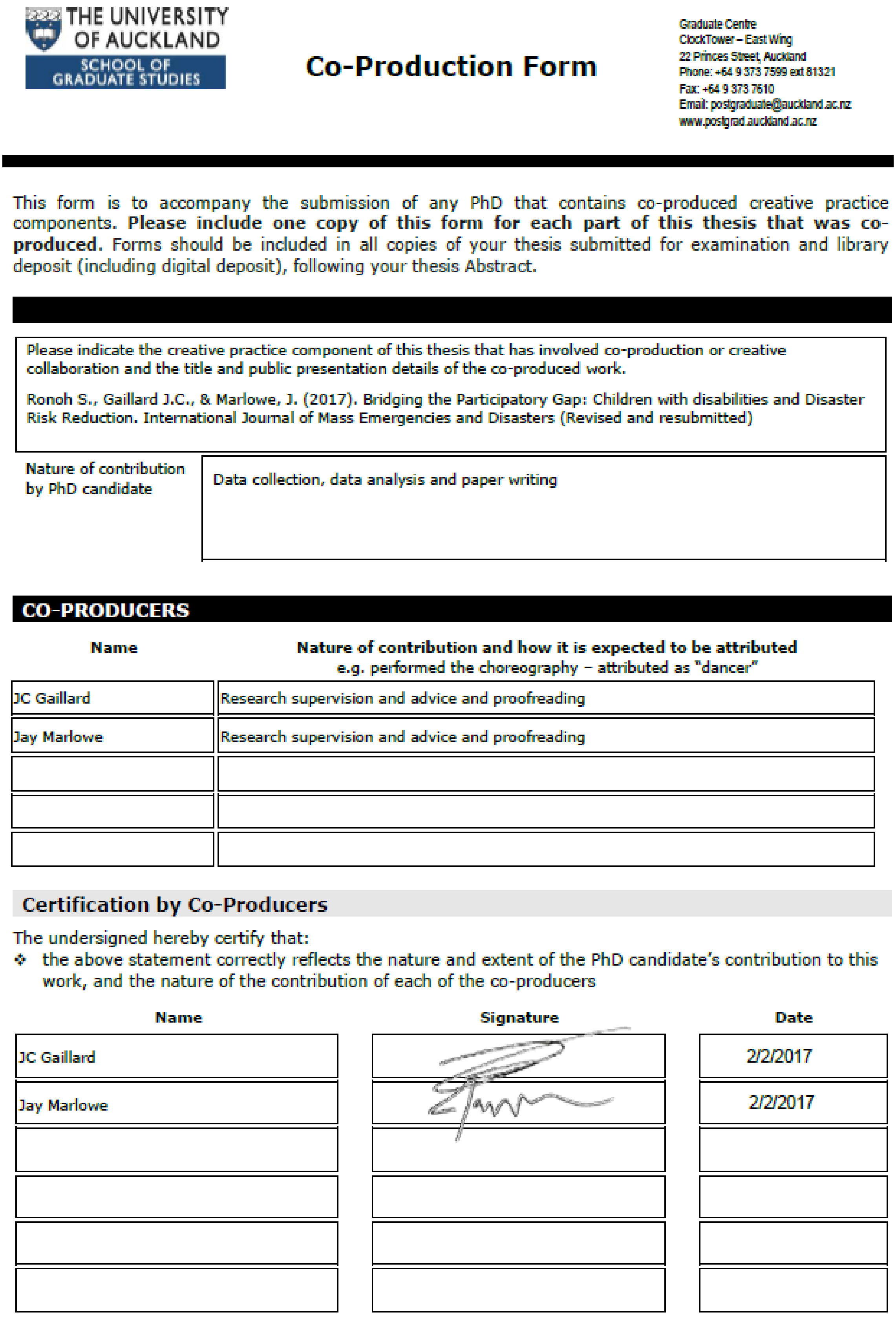

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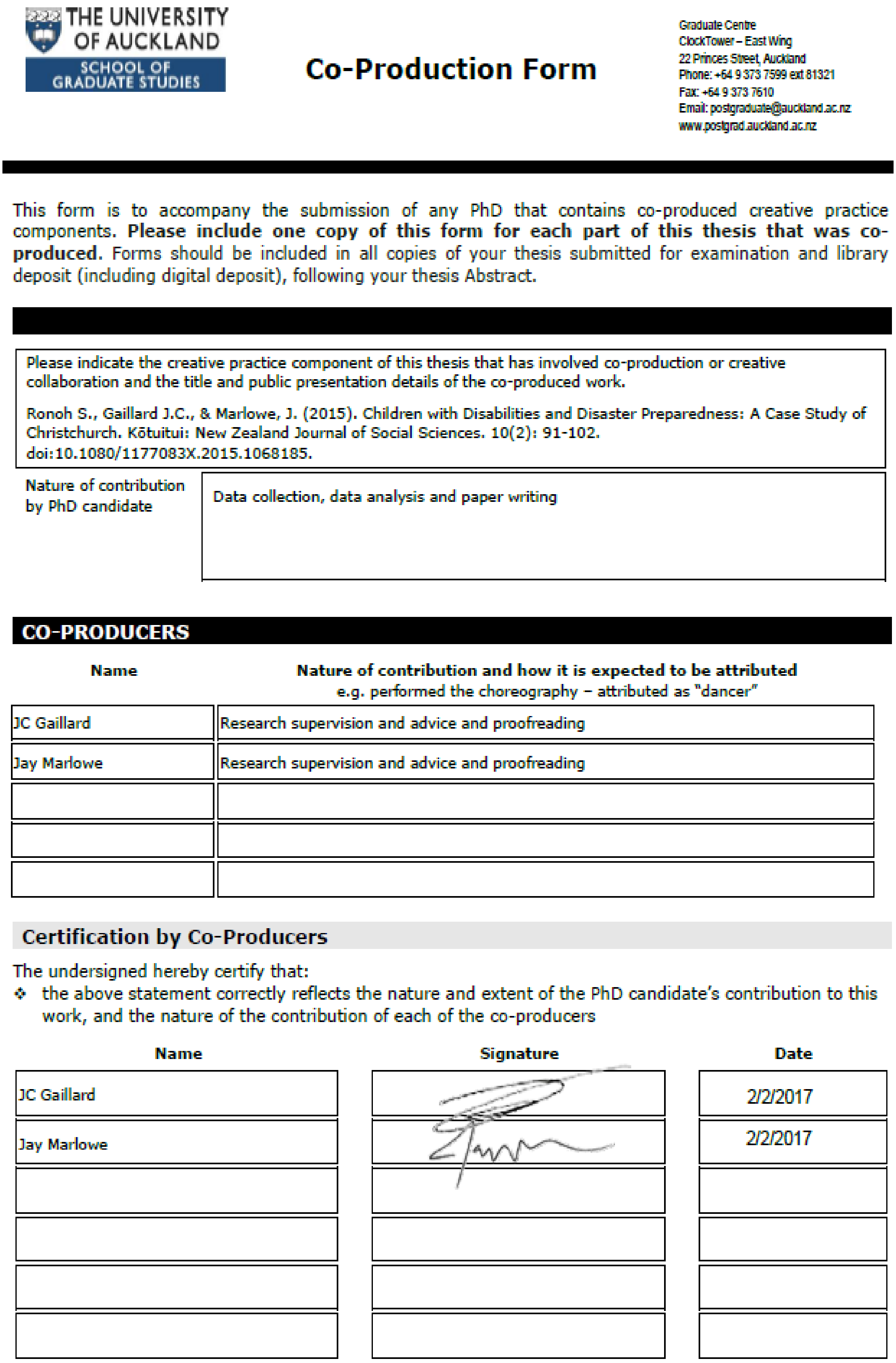

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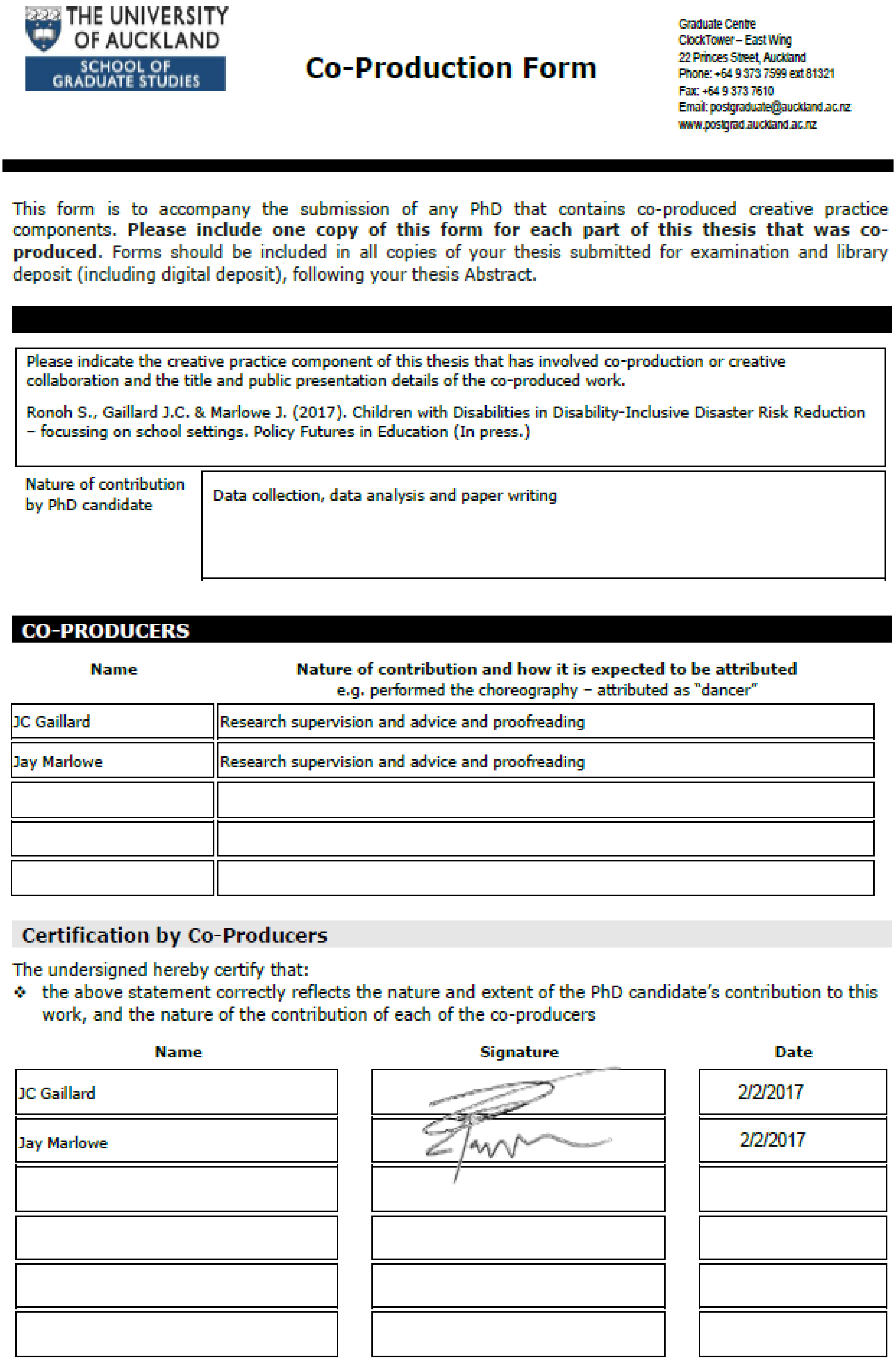

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Jay Marlowe		2/2/2017

Reading Guide

This study is presented in a thesis by publication format. It consists of five scientific papers included as published, accepted or submitted for publication by the journals (Table 1.1), and they have not been modified in any way. However, articles have been formatted for consistency of the thesis

Table 1: List of Chapters/Articles of this thesis

Article Chapter	*Tittle*	*Authors*	*Journal*	*Status*
Article 1 Chapter 2	Children with disabilities and disaster risk reduction: a review	Steve Ronoh JC Gaillard Jay Marlowe	International Journal of Disaster Risk Science	Published
Article 2 Chapter 3	Bridging the Participatory Gap: Children with disabilities and Disaster Risk Reduction	Steve Ronoh JC Gaillard Jay Marlowe	International Journal of Mass Emergencies and Disasters	In Press
Article 3 Chapter 4	Children with disabilities and disaster preparedness: a case study of Christchurch	Steve Ronoh JC Gaillard Jay Marlowe	Kōtuitui: New Zealand Journal of Social Sciences	Published
Article 4 Chapter 5	Disability through an Inclusive Lens: Disaster Risk Reduction in Schools	Steve Ronoh	Disaster Prevention and Management: An International Journal	Published
Article 5 Chapter 6	Children with Disabilities in Disability-Inclusive Disaster Risk Reduction – focussing on school settings	Steve Ronoh JC Gaillard Jay Marlowe	Policy Futures in Education	Published

Operational definitions

There is a persistent lack of understanding and clarity in terminologies associated with disability and disaster. As a result, a lack of conceptual clarity and uncritical approaches to key terms makes it difficult to articulate effective disaster policy, particularly as it relates to children with disabilities. Often the children with disabilities are portrayed as ‘helpless’ and in ‘need of care’ in a disaster (Han 1985; Aron and Loprest, 2012), and are thus excluded from Disaster Risk Reduction (DRR) planning. Consequently, there is a knowledge gap related to policy and practice with regards to how children with disabilities are particularly and uniquely affected by disaster (Peek and Stough, 2010; Stough and Mayhorn, 2013; Tierney, 2014). For over a decade, there has been ongoing debate among disability scholars to conceptualise disability (Shakespear, 1998; Smart, 2009), with a social approach holding sway as opposed to a medical view (Kelman and Stough, 2015). The social orientation approach views disability as an interplay between external social factors and individual abilities and characteristics.

The approach places emphasis on the resources and services individuals require and in the modification of the environment to facilitate people’s independence while undertaking their day to day living (Kelman and Stough, 2015). Thus, the social model of disability requires an awareness of context, structure and power that sits alongside an appreciation of the diverse ways that people may experience a disability. Concepts such as ‘equity’, ‘inclusion’, ‘accessibility’, ‘stigma’, ‘segregation’ and ‘accommodation’ are frequently employed by disability scholars when describing the meaningful engagement of people with disabilities in issues that affect them. Accordingly, this thesis adopts a social constructivist approach to both disability and disaster, where the term ‘disability’ is used in reference to a phenomenon resulting from interaction between individual capacity and the environment. A constructivist paradigm is based on the philosophical rationale that knowledge of the world is inevitably our own construction (Maxwell, 2012). In this regard, disability can be reconceptualised as “a state in which personal ability is easily exceeded within the societal system that is unprepared to support individuals who differ” (Stough and Kelman, 2015 pp.177).

The term *community* has many meanings; often it is used in reference to a group of people who have something in common, such as a geographic boundary or administrative unit (Buckle, 1998). Other writers have used terms such as ‘disabled’ or ‘disability community,’ referring to people with diverse disabilities, where having a disability is the only link among such a 'community' (Kelman and Stough, 2015). For the purpose of this thesis, the term 'community' incorporates a diverse group of people in an area (inclusive of all school stakeholders) who have the potential to experience natural hazard impact (Buckle, 1998; Marsh, Buckle and Smale, 2004).

Although the term *disaster* has been described in various ways by different researchers, the literature describing disasters has some common themes, such as an extreme event or a natural hazard with serious disruption of the community or society, or having consequences in terms of damages, lack of immediate access to livelihood resources/economic disruptions, and/or casualties so that the affected area and people are unable to deal with adequately on their own (Wisner et al., 2012, Twigg, 2015). *Disaster risk* is a function of people's susceptibility to loss, injury or death caused by a natural hazard (Wisner et al., 2012). Disaster risk reflects the concept of disasters as the outcome of continuously present conditions of risk. According to the United Nations International Strategy for Disaster Reduction (UNISDR, 2009), it is the potential for negative impacts in the form of disaster losses, in lives and livelihood, health status, assets and services, which could occur to a particular group of people, community or a society over some specified future time period.

The term *Disaster Risk Reduction* (DRR) refers to the concept and practice that aims to reduce vulnerability to disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including provision of resources, reduced exposure to hazards of people and property, and sustainable management of land and the environment (UNISDR, 2009). DRR acknowledges both the ongoing nature of disaster risks and the ongoing potential to reduce these risks.

A *hazard* is "a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage" (UNISDR, 2009, p.17). The scope of this thesis, however, is limited to natural hazards. Natural hazards such as earthquakes, tsunamis, cyclones, tornadoes, floods, and volcanoes are often characterised by their magnitude or intensity, speed of onset, duration, and area of extent (UNISDR, 2009). The term describes the actual hazard event as well as the underlying hazard conditions that may give rise to future events.

The term *capacity* is used to describe the set of knowledge, skills, and resources people resort to in dealing with natural hazards and disasters (Cadag and Gaillard, 2014). Individuals and communities have generally developed intrinsic abilities to learn, adjust, cope with and recover from disaster shocks (Davies et al., 2004). They use different skills and sources of knowledge and self-organisation and involve social networks and institutional linkages that help them in the face of disaster (Haque and Etkin, 2007). Capacities are often rooted in resources and assets that are largely endogenous to the community facing hazards and incorporate all the strengths, attributes and resources available for people within a community, society or organisations that can be used to face a disaster.

The term *vulnerability* refers to a social construct associated with fragility in the face of natural hazards (Gaillard, 2010). Vulnerability denotes the "characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of natural hazard" (Wisner et al., 2004 p.11). In essence the term represents the degree to which one's social status (for example, culturally and socially constructed in terms of roles, responsibilities, rights, duties, and expectations concerning behaviour) influences differing effects of natural hazards and the social processes that lead to and maintain that status (Wisner et al. 2012). Vulnerability, therefore, varies significantly within a group of people or community and is seen as a consequence of poor and unstable access to resources resulting in marginalisation in daily life and in facing natural hazards. Subsequently, both disaster researchers and practitioners identify children, the elderly, women, racial and ethnic minorities, the poor, persons with disabilities and immigrants, as especially vulnerable to the harmful effects of disasters (Wisner et al. 2004; Kailes and Enders 2007; Philips et al. 2010; Marlowe, 2013).

Chapter 1: Introduction

1.1 Overview

There is a global rise in the number of disasters and associated disaster risks (Centre for Research on the Epidemiology of Disasters, 2015). This is largely due to the interplay between environmental and human factors that relate to social, economic, cultural and political activities. Disaster risk is viewed as the interrelating of people and environmental hazards, and disaster researchers have made progress in identifying the root causes of disaster risk and in understanding how it can be reduced (Wisner et al., 2012). Disaster risk reduction (DRR) aims to reduce the impact or damage caused by natural hazards like earthquakes, floods, droughts and cyclones, among others.

However, researchers and practitioners have historically overlooked the experiences and needs of children and especially children with disabilities who are disproportionately affected by disaster (Peek and Stough, 2010; Winsner, 2002). Current research still tends to assume that they are passive victims or "helpless" in facing disaster (Smith et al., 2012; Aron et al., 2012; Hahn, 1985) with no capacity and role in DRR (Anderson, 2005). The downside of this assumption is that it excludes them from the disaster planning processes and threatens their safety when disasters occur. More importantly, this perspective ignores these children as a valuable resource that can inform the possibilities of DRR (Anderson, 2005). Fundamentally, this general lack of focus on children is partly attributed to their status in society. Anderson (2005) identifies three key factors that contribute to this lack of focus: (1) children are not included in setting the DRR agenda, (2) children do not carry out research, and (3) children are not part of policy-making professionals.

Consequently, there is a scarcity of studies focusing on the potential role of children with disabilities in DRR. Indeed, the limited research articles and works that mention children with disabilities have adopted a similar tone in describing this absence. These descriptions include the "paucity of published literature", a "significant gap in understanding" and that researchers have rarely considered how disabilities may contribute to DRR (Peek and Stough, 2010, Boon et al., 2011; Barnes, 2013). The current sparse research and associated DRR strategies focusing on children with disabilities leave them unprepared to face natural hazards and disasters (Peek and Stough, 2010; Boon et al., 2011; Barnes, 2013; Ronoh et al., 2015). In schools, for example, where children spend most of their day, disaster planning incorporating the children either does not exist (Barnes, 2013) or is a “one size fits all” guide (Fox and Rooney, 2007). On the contrary, findings point to the heterogeneous nature of those potentially at risk as well as the wide socio-economic and cultural differences suggest their inclusion in DRR efforts, a reason to ensure inclusiveness in the process.

Despite a notable increase in DRR studies focusing on children, in parallel with research about people with disabilities (Peek and Stough, 2010), a significant gap in knowledge arises around the experience, vulnerability, capacity and potential role of children with disabilities in DRR regardless of their disability type. This thesis highlights these vulnerabilities, capacities and potential to a holistic framework that opens possibilities where children with disabilities are integrated into DRR decision-making processes.

Three case study schools/regions in New Zealand were selected for this research. The introduction (Chapter 1) provides the research background explaining the origin of this study in section 1.2. Section 1.3 highlights the heterogeneity of children with disabilities, the status of DRR in schools and provides the basis for the study’s rationale. Section 1.4 presents an overview of risk perceptions and DRR among children with disabilities. Section 1.5 develops the study rationale by building on the case for inclusive DRR. The section details international policy frameworks relevant to children, disabilities and schools, and outlines the aim and objectives of the research. Section 1.6 outlines the conceptual framework. It discusses progress made by researchers in identifying the root causes of disaster risk: a shift from a hazard-focused approach to a more holistic perspective. The section describes the conceptualisation of disability and explores the intersection between disability and disaster. It also gives justification for the social model orientation to DRR. Section 1.7 discusses the methodological approaches and methods adopted to achieve the research aim and the specific objectives. Section 1.7 provides more detail on the selection of the three case study sites. It also describes the process of accessing children with disabilities as participants. Section 1.8 forms the final part of the introduction by outlining the structure of the thesis.

1.2 Research background

This research emerged out of two primary concerns. The first is the knowledge gap due to lack of research focusing on children with disabilities in DRR efforts. As such, a review of what is known about DRR initiatives focusing on children with disabilities was imperative prior to embarking upon research to identify effective pathways and approaches to inclusive DRR. Secondly, although significant progress is being made in understanding children and people with disabilities separately in disaster contexts, there is much to be learnt from the experience, vulnerabilities and capacities of children with disabilities to help inform and shape DRR policy that considers their needs. For example, often disasters harm the physical spaces where children with disabilities live, learn and play within the home, school, parks and playgrounds. Yet, adults rarely consult or involve them when they rebuild such spaces (Peek, 2008). Overall, the lack of access to vital day-to-day resources - natural, social, economic, physical and human - often undermines the required capacity in a disaster as well as in coping and recovering in its aftermath (Wisner et al., 2012).

Despite the literature on disaster identifying children as a vulnerable group (Anderson, 2005; Peek, 2008; Wisner, 2006; UNIDSR, 2006; MCDEM, 2009; Ronoh et al., 2015), not all children are equally vulnerable to disasters. A complex interplay exists between a child’s age, form of disability, and the school environment (Wisner, 2002; Peek, 2008; Peek and Stough, 2010). Patton and Johnston (2001) suggest that the identification of factors that contribute to vulnerability to loss or disruption from natural hazards contributes towards the development of DRR initiatives and messages that target specific groups. Examples of such groups categorised as vulnerable to natural hazards and disasters include children, the aged, ethnic minorities, women, people with disabilities and those with limited literacy skills, among others. Patton and Johnston (2001), nonetheless, caution that the same factors (e.g. age, ethnicity, and disability) may act to increase or sometimes decrease vulnerability depending on its contingent relationship with environmental and hazard characteristics. Consequently, the process of production of DRR initiatives, as well as the dissemination of key messages, is rendered less effective because it assumes a level of homogeneity among groups such as children, older adults and minorities, which is unrealistic (Ballantyne et al., 2000; Stough and Kelman; 2015).

This research is framed from an acknowledgement of the complexity and heterogeneity of people, specifically children with disabilities as a “vulnerable group”, with the aim of accommodating their perceptions, needs and capacities in facing natural hazards and disasters. There is a general association of disability with other terms, such as ‘vulnerable groups’ or ‘special needs’ or those ‘in need of special attention/help’ (Stough and Kelman, 2015). People with disabilities are often considered as a single homogenised group - “people with disabilities”. The ambiguity in understanding the term ‘disability’ means policy and decision-makers adopt a patriarchal approach that assumes the less able are not capable of contributing to DRR (Wisner, 2002; Mitchell et al., 2008; Watson et al., 2012). This lack of understanding necessitates the need for disability-incisive research, which is a key focus of this thesis as highlighted in the next section.

1.3 The Case for Disability-Inclusive Research

This research, which specifically focuses on the needs of children with disabilities, receives its impetus from four key international policy documents. The United Nations Convention on the Rights of the Child (UNCRC, 1989), The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006), and most recently, The Comprehensive School Safety Framework (UNESCO, 2013) and The Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR, 2015). Thus this study’s approach, subsequent findings and discussions are grounded in academic literature, and it gives due consideration to these relevant international declarations and documents that emerged out of varied but specific contexts below.

The view of children as active participants is a notion grounded in rights-based interventions that rest on the principles of human rights and social inclusion (Abebe, 2009). The UNCRC, articles 12 and 13 state that children have a right to express their opinions in matters that affect them, and that this form of expression should not be limited to speech. Notably, the UNCRC was adopted without a vote as a human rights document and received wide global acceptance within a year of its adoption (Hafen and Hafen, 1996). It was a culmination of the previous Geneva Declaration of the Rights of the Child adopted in 1924 and in the Declaration of the Rights of the Child adopted by the General Assembly in 1959. It is recognised in the Universal Declaration of Human Rights, in the International Covenant on Civil and Political Rights (in particular in articles 23 and 24), and in the statutes and relevant instruments of specialised agencies and international organisations concerned with the welfare of children.

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006) is the first significant human rights instrument aimed at protecting and promoting the fundamental rights of persons with disabilities. This convention builds and elaborates on rights already set out in the World Programme of Action Concerning Disabled Persons of 1982, and the 1993 Standard Rules for the Equalization of Opportunities for Persons with Disabilities, among other United Nations (UN) human rights instruments (Barnes and Mercer, 2001). The associated principles are based on respecting differences and accepting people with disabilities as part of a diverse human society. In line with articles 11 and 32 of the UNCRPD, disability-inclusive DRR pays specific attention to persons with disabilities and their families, since their vulnerability in a disaster might reduce the entire family or society's ability to face a disaster.

The Comprehensive School Safety Framework (UNESCO, 2013) grew out of a Worldwide Initiative for Safe Schools and the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector. Its goal is to promote school safety as a priority area of post-2015 frameworks for sustainable development, risk reduction and resilience. Essentially, the framework provides an inclusive approach towards reducing the risks of natural and other hazards in schools. It brings together all child-centred, child participatory and evidence-based efforts to the core of school safety initiatives and recognise rights to safety, education and participation. Its three comprehensive pillars support safe learning facilities, school disaster management and risk reduction education (UNESCO, 2013).

In 2005, 168 countries signed the Hyogo Framework for Action (HFA), which provided signatories with a systematic approach to reducing vulnerabilities and risks from man-made and natural hazards. Over a period of ten years (2005-2015), HFA was largely effective as a catalyst for public sector action. The Sendai Framework (SFDRR, 2015) is a product of the Third United Nations World Conference on Disaster Risk Reduction held in March of 2015 in Sendai, Japan. The conference was attended by over 25 heads of state and governments, senior officials and delegates from over 187 countries. Thus the SFDRR (2015), which effectively replaced the HFA, was adopted and endorsed by the UN General Assembly. SFDRR is particularly strong on the need to include individuals with disabilities in the DRR agenda (Stough and Kang, 2015). First, the SFDRR draws new attention to the experiences, capacities and potential role of people with disabilities in DRR. Beginning with the preamble, it particularly calls for governments to engage a wide range of relevant stakeholders to be included in the design and implementation of DRR policies and planning. It states as follows:

> "*Governments should engage with relevant stakeholders, including women, children and youth, persons with disabilities, poor people, migrants, indigenous peoples, volunteers, the community of practitioners, and the older persons in the design and implementation of policies, plans and standards*" (SFDRR, 2015 pp.8).

Second, the SFDRR has included and uses language and concepts rooted in the history of disability studies, though this may not be initially apparent to disaster scholars (Stough and Kang, 2016). Three key concepts with a theoretical grounding in disability research, policy and practice having applicable value in DRR are used: *universal design, inclusion and accessibility*.

The concept of *universal design* is in reference to architectural design that requires modification to accommodate people with disabilities. *Inclusion* has its aim for people with disabilities to participate in settings and activities as much as people without disabilities. The SFDRR, in paragraph 7, directly emphasises the need to include people with disabilities, noting that DRR requires empowerment and inclusive, accessible and non-discriminatory participation particularly for those disproportionately affected by disaster. The concept of *accessibility* means access to the same services, facilities, information, tools and activities that are available to people without disabilities (Stough and Kang, 2006). Examples here range from basic needs such as food, shelter, water, transport, warning systems, and provision of information and means of communication.

To address these objectives, this research uses flexible participatory tools such as mapping and proportional piling to explore the notion of 'participation' and experience that children with disability face regarding natural and other hazards. The goal is to accommodate and permit a sustained continuum of engagement among children with diverse disabilities, capacities and experiences. Thus, such an approach offers a bridge that recognises communication as a two-way process amongst children, and between adults and children. Subsequently, the approach accords them a voice in DRR in line with significant universal declarations, frameworks and human rights commitments that support the protection and promotion of the fundamental rights of children with disabilities.

Admittedly, while these international policies and commitments lay solid ground for the need to ensure inclusiveness in DRR, they need to be fine-tuned and adapted to suit local context.

However, there is still limited progress to the much-needed momentum to undertake evidence-based research focusing on the experiences and needs of children with disabilities research. Indeed, little is known about how a specific hazard might differentially affect people with disabilities, for example, how people with visual, hearing and mobility impairments are differentially affected by an earthquake. This research and knowledge gap pertaining to children with disabilities in disaster contexts continues to persist, signalling the need for further study to assess and understand complexities and effective pathways for ensuring active participation by children with disabilities in DRR. The study's basic goal is to assess and interpret the experiences of children with disabilities in dealing with natural hazards and identify their actual and potential contribution to DRR. This general goal is achieved through four objectives:

- To explore awareness, understanding and experiences of disasters by children with disabilities.
- To identify factors that make children with disabilities potentially more vulnerable in facing natural hazards.
- To assess the actual contribution to and opportunities available for promoting DRR among children with disabilities and their carers in New Zealand
- To identify effective strategies, and avenues already in place, for promoting DRR among children with disabilities.

To address these objectives, a wide range of data collection techniques were used, including participatory tools to permit a sustained continuum of engagement, particularly among children with diverse disabilities. Participant observation, semi-structured interviews and a review of documents were also used, as discussed in the following chapters. Each school provided a general list of disabilities among the selected child participants, which could be one or more of the following: autistic spectrum disorders; learning, hearing, seeing, and mobility/physical disabilities; and other degenerative conditions[1].

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[1] *Although the schools did not disclose or directly link each child with a disability, the schools allowed the researcher to access their special class units for children who have diverse disabilities*

1.4 Disaster Risk Reduction in School settings

Disasters have often occurred when children are at school, and tend to be prominent due to the tendency to involve a large number of affected students and touch the local community (parents, teachers and other stakeholders) in one way or another (Kelman, 2007). This necessitates a need for research and practice that enhances inclusive DRR. Important and relevant for this research is that most, if not all, schools support children with disabilities. A school thus becomes a significant avenue to initiate DRR programmes that consider children's diverse needs and the needs of children with disabilities in particular. A compelling premise is that when children learn and practice new DRR initiatives, they tend to share that information with peers and family members (Kelman, 2007).

The 'education for all' campaign is a product of a fundamental human right – to education (UNESCO, 2007). It is an ongoing, lifelong process of inquiry (Freire, 1970), which continually happens both formally and informally (Kelman, 2007). The process of formal or informal social education comprises acquiring skills, values, knowledge, behaviour, and attitudes. The purpose of DRR education is for people to understand the risks of inaction, and to recognise and embrace cooperative efforts with regards to DRR. The DRR education process should, therefore, include deep, critical and proactive engagement for understanding the root causes of disaster risk and for acting on those root causes (Wisner, 2007). At the core of DRR education research in schools is the axiom that disasters are not inevitable but require a body of knowledge about a broad range of protective actions. It necessitates an understanding of environmental and social conditions, and the human actions and inactions that transform any particular natural hazard into a disaster in the first place (Patel, 2007).

However, several studies and reports indicate that many schools and school children are inadequately prepared to apply protective actions in natural hazards and disaster events (Shores et al., 2009; Boon et al., 2011; Stuart et al., 2013; Johnson et al., 2014). King (2000) stresses that understanding DRR initiatives and applying recommended action is critical since disaster events may occur when individuals and communities are isolated from support for a long time and may not have immediate access to emergency service providers. DRR programmes in schools aim to provide children with knowledge and tools: a combination of actions, processes and attitudes necessary in the face of a disaster (Global Education Cluster, 2012). The objective of such DRR programmes is to motivate individuals and groups to take actions that reduce disaster risk (Neilsen and Lidstone, 1998; Johnston et al., 2014). Most schools, for example, place emphasis on the memorisation of basic response skills through disaster drills conducted at regular intervals, expected times, and locations and many times when students are at their desks (Johnston et al., 2011; Petal, 2008; Johnson et al., 2014).

Although empirical research findings are that such DRR programmes and initiatives can increase knowledge and awareness of disaster risks (Ronan and Johnston, 2005; Rodríguezes et al., 2007), application of these initiatives is often not effective (UNSDR, 2011; Johnson et al., 2014). This lack of transference from knowledge to practice is what Kailes (2006) refers to as "lessons learned, but not applied", necessitating an approach that considers children's perceptions, needs and capacities. This is an important aim of this study: to give voice to children with disabilities through engagement in research using participatory tools as exemplified by the clarion call of "nothing without us" (Charlton, 2000).

In most schools, children, especially those with disabilities, are reliant on adults for support and day-to-day resources: the children may have varied limitations based on age, ability and/or existing disabilities, which subsequently translates into a limited ability to influence some decisions that affect their lives. They may have physical limitations based on their age or disability, and they are often excluded from decision-making processes on issues that affect their lives (Wachtendorf et al., 2008; Watson et al., 2012). For example, teachers and care-givers are tasked with managing their day, supporting with personal care, administering medication and transferring them in and out of wheelchairs. This happens in the classroom, the playground and at home, depicting the children as incompetent, dependent and in need of protection, which mask their actual capacities (Woodhouse, 2004). Such adult support provides an erroneous justification for using proxies as children's representatives (Booth and Booth, 1996). Proxies may be professionals such as speech therapists and specialist teachers acting in expert roles, or caregivers or people with close relationships who know the child well (Nind, 2009)

In the same vein, schools can provide powerful and essential venues to convey effective and inclusive DRR initiatives (Anderson, 2005). Children are often trusted and effective at relaying DRR initiatives and messages as communicators and translators (Mitchell et al., 2008; Haynes and Tanner, 2013). Such DRR initiatives and messages can be far-reaching, particularly when children are also “considered as dynamic agents of change rather than simply vehicles for risk communication” (Mitchell et al., 2008, Pp.272).

1.5 Risk Perceptions and DRR among children with disabilities.

People’s perceptions of disaster risk vary and may highlight the importance of their active engagement in DRR initiatives (Wachinger et al., 2013). In general, factors that affect risk perceptions usually vary across hazard types and among different people (Lindell, 1994). However, how risk information is presented can have a major impact on perceptions, associated decisions and follow-up actions (Slovic 1986; Mitchell et al., 2008). Thus, Slovic (1986) argues that risk perception and judgement is influenced by the memorability of past events like a recent disaster, heavy media coverage or even a vivid film, all of which might distort perception of risk. Slovic (1993) also emphasises the important role that social values and trust play in risk perception, acceptance and associated preparedness actions that need to be taken. In addition, the perception of event-likelihood and beliefs about one’s ability to face and cope with a disaster are linked to an understanding of a particular disaster risk and the levels of disaster preparedness (King and Tarrant, 2013). Therefore, effective risk communication should recognise and find comprehensive ways of presenting complex material that is often clouded with uncertainty and is inherently difficult to understand (Slovic, 1986). In addition, risk messages must have cultural and individual meaning to be effective (Mitchell et al., 2008). Overall, people’s lack of awareness and unrealistic perceptions of risk may negatively affect DRR efforts (Lindell, 1994; Ronan et al., 2001). However, the research that focuses on these topics is almost exclusively adult-based or focused on children who do not have disabilities (Lindell 1994; Ronan et al., 2001; Fothergill and Peek, 2006; Peek and Stough, 2010).

Mitchell et al. (2008), point out how children can be potential informants within the risk communication network system. Their potential as a risk communication resource has, however, been ignored (Mitchel et al., 200; and Anderson, 2005). Instead, information flows from top downwards, from adults to children. For children, especially those with disabilities, carers and parents are assumed to pass this information on to the children and act to protect their safety (Mitchel et al., 2008). Children with disabilities particularly do not have the same level of independence of action that can allow for consistent and ongoing DRR initiatives. Initiatives at home and at school are usually adult-led activities. It is, therefore, necessary to involve children and include information that helps them understand what they can do relatively independently and to identify areas where they may need to seek adult support (Ronan et al., 2001).

A specific challenge towards disability-inclusive DRR stems from people's perceptions of disability, its definition, and the implications of associated definitions on DRR policy and practice. In conceptualising disability, Stough and Kelman (2015) in their book '(Dis) aster and (Dis) ability' have argued that it is a state in which personal capacity is easily exceeded within the societal system that overlooks the support required by individuals who 'differ'. The term disability is broad, with varying classifications that are socially constructed and defined by medical and social assessments, and discourses (Bankoff et al., 2004; Birkman, 2006; Watson et al., 2012). For example, the medical model approach views disability as a natural consequence of impairment rather than a condition caused by society (Priestley, 1998). The social approach views disability as stemming from the failure of a structured social environment to adjust to the needs and aspirations of citizens with disabilities, rather than from individual failings or inabilities to adapt to societal demands (Hans et al., 2008; Watson et al., 2012).

The study uses participatory tools and follows a constructivist view where information and knowledge construction is central. It is based on social interaction, participatory activities and assessments (Schuck, 2102), and avidly seeking student's ideas. The constructivist paradigm premises that "truth is relative and dependent on one's perspective. The researcher's intent is to make sense of (or interpret) meanings others have about the world" (Creswell, 2013, p.25). A key assumption is that people are active learners and develop knowledge themselves through social interaction with persons and situations. As such, learning should involve changes in cognitions – knowledge, skills, and beliefs – and therefore should comprise the acquisition and modification of knowledge, skills, strategies, beliefs, attitudes and behaviours (Schuck, 2012). The study demonstrates that children's experience of the world is different from adults', including their perception of different 'spaces' (Thompson and Philo, 2001). The use of participatory tools, in particular, enabled participants to contribute their views, and, with teacher support, shared their experiences and their perceptions of risks. Significantly, they each had their own skills, experiences, interests and expertise, and thus participation was along a continuum (Mutch and Gawith, 2013; Franklin and Sloper, 2009). Peers served as active agents in the discovery process and fit well with constructivism where learning is known to produce good achievements with marginalised, minority or low-income groups (Schuck, 2012). For this reason, a constructivist perspective works well with children with disabilities.

1.6 Research Conceptual Approach

Traditionally, disaster research has been studied largely from the geophysical science perspectives, such as hydrology, volcanology, seismology and meteorology. This is what Hewitt (1983) referred to as the "dominant" hazard-focused viewpoint, and where consideration is predominantly on the intensity, scale and frequency of hazards as the cause of destruction (Heijeman, 2009). The dominant approach rests on the general acceptance that disaster is a result of "extremes" in geophysical processes. For example, natural hazards, disaster occurrences and associated features of calamities are seen to depend primarily upon the nature of storms, earthquakes, floods or droughts. Disasters are therefore considered as natural and unpredictable, separated from the wider political, historical, cultural, social and economic conditions (Wisner et al., 2004; Hewitt, 1983). Subsequently, over the last few decades, this view has contributed to immense scientific efforts and actions being directed at geophysical monitoring, forecasting and direct engineering or land use planning (Gaillard, 2010; Hewitt, 1983). In effect, the historical, cultural, social, economic and political factors have been relegated to the periphery.

On the other hand, is what has been refered to as the "radical" viewpoint which acknowledges that hazards and disasters tend to be a consequence of human action or inaction of decisions about the allocation of access to resources and locations, and the power or lack of power to make those decisions (Mueller-Mann, 2011; Wisner et al., 2012). The resultant effect is 'differential vulnerability' that is socially structured (Priestley and Hemingway, 2007; Tierney, 2012). Kenneth Hewitt (1983) in the book "Interpretations of Calamity" advanced the view that risk and disasters emerge from everyday, regularised, ongoing features and processes taking place in the societies in which they occur. They are from socially linked vulnerabilities and capacities of the people. Simply stated, disasters are 'designed' through past and ongoing decisions (Tierney, 2012). The way forward is an approach that reflects a process rooted in life and livelihood routines, and the way in which longstanding systems of social, economic and political power either provide resources and options or constrain lives and livelihoods (Wisner et al., 2012). The approach should acknowledge that people have capacities when a disaster occurs (Tierney, 2012).

Wisner et al. (2012) argue that all people possess some capacities to resist, avoid, and adapt to the processes of disaster preparation and response, and they are able to use their abilities for creating security, either before or after a disaster. Almost everyone, including children with disabilities, usually has some capacity for self-protection and group action (Wisner et al., 2012). While disasters can and do negatively affect people, including those with disabilities, individuals do not passively wait for a disaster occurrence and then passively wait to be helped afterwards. Instead, people with disabilities respond actively to disasters (Tierney, 2012). A relevant example is how people with disabilities negotiate altered and sometimes difficult physical and environmental limitations on a daily basis (UNISDR, 2013). They often operate with heightened complementarity. Others have enhanced tactile sense and are often able to navigate in the dark, thus providing them with a "psychological advantage" that makes them less likely to become injured or to panic in a disaster (UNISDR, 2013).

Disaster literature suggests that people differ significantly in their degree of vulnerability to natural hazards (Anderson, 2005; Tierney, 2012; Wisner, 2002; Wisner et al., 2012). The level of vulnerability affects their level of involvement in DRR efforts. Vulnerability to disaster is associated with a number of socioeconomic factors that include income, poverty, social class, age, ethnicity, gender and disabilities that intersect with all these factors (Wisner, 2002; Wisner et al., 2012). Watchendorf et al. (2008) also affirm that social/organisational factors contend with the pre-disaster social structure: the ways in which decisions are made; leadership; divisions within the community; and social coping systems. Given their day-to-day living conditions, society's poor, who are dependent and isolated, are often directly or indirectly facing increased exposure to disaster risk due to marginalisation. The main driver of loss and harm in disaster events is 'differential vulnerability' that is socially structured. This conclusion is consistent with the literature of the social construction of problems, where risks can be viewed as outcomes and products of established institutions and social movements. Tierney clearly establishes this trend, stating, "The build-up of risks is a result of sins of commissions and sins of omission on the part of the powerful and influential social factors" (Tierney, 2012, pp. 81).

It follows that knowledge and people's constructions of what 'reality' is becomes entrenched in the societal fabrics/structures (Berger and Luckmann, 1991). This social construction of reality, including risks, permeates everyday life in many ways that are both explicit and subtle, often reflecting the dominant groups within the society (Tierney, 2012). For example, formal and informal forms of communication expectations of people of different statuses and different stages of life are a reflection or the basis of social constructions. Thus, well-established constructions should not be taken for granted in everyday lives of people because they constitute the reality from which social activities draw their meaning (Tierney, 2012). While exploring the intersection of disability and disaster, Kelman and Stough (2015) point out that the common assumption of the occurrence of both disability and disaster is negative, starting with their shared prefix 'dis-', connoting negativity or a lack. Hence the association of disability with a lack/absence of ability while 'bad luck' is associated with disaster. However, the authors give a counter-argument that disasters are indeed actively designed by societies that fail to include the needs of all people (Kelman and Stough, 2015, Wisner et al., 2004) as opposed to being random or unexpected 'bad luck' events (Hewitt, 1983). Although Kelman and Stough, (2015) recognise the existing limitations due to disability, and that disasters have negative effects, people with disabilities have capacities and respond actively to disasters.

The construction and conceptualisation of disability has been ongoing among disability scholars (Oliver 1986; Crow 1996). The term "disability" is used throughout this thesis to align with the social construction approach to disaster and disability. The approach emanates from the interaction between the individual capacity and the environment. The social approach, which sees disability from an interplay of external social factors and individual abilities and characteristics, is gaining prominence, compared to the medical approach which views disability as an impairment or an ailment located within the individual (Kelman and Stough, 2015). Importantly, the social approach focuses on resources and services that an individual requires and the ways in which the environment needs to be modified to enable people to be as independent as possible in day-to-day living, in line with constructs by most disability theorists. Such constructs are access, equity, inclusion, stigma, segregation and accommodation (Kelman and Stough, 2015).

Wisner et al. (2004) suggest a move away from a focus on "vulnerable persons" to "vulnerable situations", within which some people are placed at increased risk more than others, due to factors such as economic, political and cultural. This approach takes the view that human society, and not nature, determines the likelihood of being negatively affected by natural and other hazards. Often, there are people, who, when faced with such an event, have limited resources (Hewitt, 1997). Pre-existing societal vulnerabilities and ongoing inequalities are subsequently unmasked and made visible when a disaster occurs (Lewis, 1999).

A way forward for inclusive DRR is to take into account the human dimension of disaster, and societal and cultural factors surrounding risks alongside natural hazards (Wisner et al., 2004). It implies that disasters have social-economic and political roots/origin, rather than natural (Gaillard et al., 2007). Such a view provides for space to integrate and foster decision-making capacities amongst the local community, and, in this case, children with disabilities and their carers. This research aims to emphasise that children with disabilities require a comprehensive approach, appropriate to their age and ability, that is able to address existing inequalities (Mitchel et al., 2008). Research focusing on children with disabilities means that there should be more understanding and insight into their experiences, risk perceptions, and help in shaping future DRR policy and practice.

1.7 Applying a multi-case study approach

This research used a multi-case study approach and incorporated specific participatory tools to help inform DRR for children with disabilities. Yin (2014) describes a case study as a qualitative approach in which a researcher explores real life, and retains a holistic and real-world perspective in a contemporary bounded system or cases; it is also conducted over time and through in-depth data collection (Creswell, 2013). Stake (1995) recommends the definition of cases to involve identification of inclusion/exclusion criteria, description of relationships that may be present based on logic and theory, and provision of an opportunity to gather general constructs. For this study, three schools from different regions in New Zealand formed a basis to understand DRR with children with disabilities (Stake, 2006). In particular, both substantive and practical considerations guided the definition and selection of the three research case studies. Substantive considerations involved selecting a significant or ‘special’ case (Yin, 2009). For example, the Christchurch case study was significant for this research as it provided the children with an opportunity to reflect on their experiences following the February 2011 earthquake.

Further, children with disabilities are classified as individuals having potentially diminished autonomy as a result of physiological/psychological factors or status inequalities (Moore and Miller, 2009). They are likely to experience real or potential harm and require special safeguards or gatekeepers to ensure the protection of their welfare and rights during research (Silva, 1995). Consequently, there are unique and difficult challenges when accessing children with disabilities for research, resulting in the absence of research that focuses on children with disabilities and their potential role DRR, making the current case ‘special’. The sparse research and limited knowledge of children with disabilities make a case study a suitable approach. Hartley (1994) argues that case studies are suitable for exploring new processes or ones that are little understood, and therefore cases may form a basis of significant generalisation (Yin, 2014). Each of the three cases selected for this study was designed to bring out the details from the viewpoint of the children from multiple sources to help draw conclusions (Tellis, 1997; Stake, 2006).

Case studies, as opposed to surveys and experiments, accommodate uncertain boundaries between the phenomena being studied and the context (Yin, 2012). Hence, case studies are tailor-made to respond to ‘how and why’ questions about contemporary events and enable an approach to tackle information that is often difficult to obtain. For example, the complexity of researching vulnerable groups and children with disabilities (with hearing, sight and mobility difficulties) from various geographical regions and with varying experiences of natural hazards makes a case study a suitable option. While discussing research methodologies for children with disabilities, Lewis and Collis (1997) argue that the main advantage of case studies is that the observer does not necessarily make comparisons with other children in other groups. Instead, focus and attention are on the child and his or her experience, rather than looking at differences from, and similarities to, other children or groups.

In comparison with other approaches, the strength of a case study rests on its power of attention to the local situation (Yin, 2014). This is central when research is meant to address descriptive questions (e.g. what is happening) or explanatory questions (how and why something is happening) (Yin, 2014). This approach aligns with the aims of the current study in two ways. First, it assesses and interprets the experiences and perceptions of children with disabilities when facing natural hazards. Second, it identifies their actual and potential contribution to DRR. The approach has its basis in a constructivist paradigm that truth is relative and dependent on one’s perspective. The researcher’s intent is to make sense of (or interpret) meanings others have about the world (Creswell, 2013; Thomson and Philo, 2004) through ‘child centred’ participatory tools. There is a clear contrast, for example, to a survey which is limited to addressing ‘how often something is happening’ or experiments that assess the effectiveness of an initiative in producing certain outcomes. Also, among other issues, a survey is limited by questionnaires that struggle to fit in all relevant questions, and by the participants' ability to meaningfully complete questionnaires.

In the current study, for example, the contextual conditions are regarded as relevant to assessing the experiences and perceptions of children with disabilities towards natural hazards within their school. Yin (2014) argues that a case study approach allows the researcher to obtain real-world context data, which originates from the natural settings. It also provides a close collaboration between the researcher and the participant (Baxter and Jack, 2008) as opposed to derived data in response to an experiment or response to a questionnaire (Yin, 2014). Case study critics often point out the absence of specific requirements guiding the approach and sometimes leading to poor case studies (Yin, 2003). Nevertheless, its proponents argue that the absence of such strict guidelines allow the design and data collection to be tailored to the research questions (Yin, 2014).

A second important feature of the approach is its basis in a constructivist paradigm based on the philosophical assumption that knowledge of the world is inevitably our own construction (Maxwell, 2012). The researcher interprets meanings others have about the world (Creswell, 2013), thus allowing both an analysis and an interpretation of children's understanding of and perception towards natural hazards using participatory tools. Although the paradigm recognises the significance of subjectivity in meaning, it still accommodates some notion of objectivity, largely built on the premise of the social construction of reality (Creswell, 2013; Baxter and Jack, 2009). The approach acknowledges that children's understanding of natural hazards is different from adults' experience of the world. Children, including those with disabilities, perceive and utilise all sorts of spaces differently to adults (Thomas and Philo, 2004; Ronoh et al., 2015). Case studies are also suitable when boundaries are not clear between phenomena and context. For example, there is no clear separation between resources explicit for daily life, and those resources for DRR. Again, it may not be practical to place a clear boundary around the children (who often work with adults) when describing how they access resources and the associated level of involvement in DRR. Indeed, McConachie and Diggle (2007) stress that often child participation and experiences occur as part of a family or school, or in a community with adult support. DRR frameworks should, therefore, provide for collaborative avenues where children can work together with adults that account for their strengths and limitations.

The current case studies consider both the voice and perspective of the actors (children) but also those of other relevant group actors (Yin, 2014), including teachers, caregivers and other stakeholders, and the interaction between them. Thus the approach offers a multi-perspective analysis and crucially gives a voice to the children, who are usually powerless and voiceless (Tellis, 1997). Hartley (1994) states that case studies are suitable for exploring new processes or behaviours, or ones that are little understood. The next subsections describe the case definition and selection process, how the participants were accessed, and the significance of a multiple case study. This is followed by the data collection and analysis strategies that make a case study approach suitable for research among children with diverse disabilities in disaster contexts. Indeed, within the vulnerability paradigm, disaster researchers and practitioners identify children with disabilities as especially vulnerable to disasters (Wisner et al., 2004; Kailes and Enders, 2007; Philips et al., 2010).

1.7.1 Definition and selection of cases

A preliminary theory or propositions related to the research topic are crucial in guiding the design and data collection stage (Yin, 2014). The same is not true with other qualitative methods, such as ethnography and grounded theory (Corbin and Strauss, 2007). These methods may avoid specifying any theoretical proposition at the onset of an inquiry. Nonetheless, a theory in case study designs assists in “defining the case to be studied, identifying criteria for settling and screening the potential candidates for the cases, and suggesting relevant topics of interest and therefore possibly data to be collected” (Yin, 2012, pp. 27). Specific propositions (Yin, 2003) may often be required to place limits on the scope of the study: they help keep the project within feasible limits. A case study with a proposition becomes easier to implement.

However, Yin argues that the proposition should be a simple set of relationships about events, acts and structures and should not be considered as a ‘grand theory’ (Yin, 2012). Propositions are a guide to coming up with the research framework: they identify who will and who will not be included in the study; they describe relationships that may be present based on logic; and they provide the researcher an opportunity to gather general constructs. In the current research, three propositions guided the study in line with the research questions.

1. The case study will assess the challenges faced and the support required by children with diverse disabilities as they deal with natural hazards.

2. The case study will show that the simple availability of DRR resources does not necessarily translate to the access and use of available resources by children with disabilities to reduce their vulnerability and enhance their capacity in facing natural hazards.
3. The case study will determine how the involvement (or lack thereof) of children with disabilities in school DRR planning "influences their potential role."

Case study propositions help represent key issues from research literature (Yin, 2014), thereby advancing knowledge of a given topic. Notably, the issues for this research (children's capacity and vulnerability) are intricately connected to societal power relations. Specifically, the study sought to explore the experiences of children with disabilities towards a natural hazard, and consequently, the children with disabilities could effectively respond to this research question. Moreover, apart from a document review, semi-structured interviews to obtain perspective from caregivers, teachers and other stakeholders, the children were to provide their perspective and insight into their experiences, which would help shape future responses to disaster. The research focus and the main source of data is therefore children with disabilities who attend one of the three schools from the selected case regions (Christchurch, Hawke's Bay, and Auckland).

1.7.2 Using multiple cases as part of the same study

As with the current study, when a study contains more than one case, it is referred to as a multiple case study. A common case study argument is that two or more cases often tend to be stronger than a single case (Stake, 1995; Baxter and Jack, 2009; and Yin, 2003, 2009, 2014). Ideally, the other cases often produce a direct replication of the first case, which may be a similar result (internal replication) or contrasting results, but for predictable reasons (theoretical replication) (Yin, 2003). Multiple cases have two or more cases that deliberately try to test conditions and replicate findings, or predict similar results, or might include deliberately contrasting cases (Yin, 2009). For example, although all the three cases involved children with diverse disabilities as participants, the different geographical locations meant that their natural hazard and disaster experiences varied (from one region to another).

Yin (2009) identifies two challenges to multiple case studies, beginning with time and resources to broaden the coverage of the study. For example, this approach allowed focusing on three schools from three different case study areas, selected to illustrate key issues and make comparisons (Creswell, 2013). It started with the researcher undertaking two prior visits to each of the three schools from different regions in New Zealand. The visits were central in finalising the research design where the research goals, associated methods and tools were arrived at with the school principals, teachers and school boards prior to obtaining research ethical approval. Another purpose of the visits was to directly seek access to the participants, to build rapport and to establish trust with the school staff, and particularly with children with diverse disabilities. These visits and engagements with the schools occurred over a period of ten months.

Case Study Regions of New Zealand

Figure 1.1. Map of New Zealand-case study regions.
Source: Created using ArcGIS

This thesis draws on three case study schools that work with children with diverse disabilities in the New Zealand regions. The three case study sites reflect differing geographical locations (Figure 1.1) and experiences of past natural hazards and disasters. Two of these regions, Hawke's Bay and Christchurch, have experienced disasters in the past and recent history respectively.

Significantly, the Christchurch case study took place only three years after the Canterbury earthquakes of 2010 and 2011. The September 2010 earthquake (magnitude 7.1) caused damage in the city, resulting in liquefaction and flooding in Christchurch. The February 2011 earthquake (Magnitude 6.3) caused massive destruction to buildings and infrastructure in the city, and left 185 people dead (Gibbs et al., 2013). In the Hawke's Bay region, the February 1931 (magnitude 7.8) earthquake rocked and devastated housing, buildings and infrastructure, followed by rapid fires in the city of Napier. There were several landslips and 4000 hectares of seabed rose as a result, causing the death of 256 people across the whole region (Dowrick et al., 1995). In the recent past, the region has experienced numerous storms and floods. Although the Auckland region has not experienced a major disaster event in the recent past, volcanic eruptions, tropical cyclones, floods and tsunamis are potential natural hazards (Newham et al., 1999). As of November 9, 2016, The New Zealand Ministry of Civil Defence and Emergency Management (MCDEM) lists on its website (www.civildefence.govt.nz) some of the natural hazards in each of the case study areas (Table1. 1).

Table 1.1: List of natural hazards in the three case study areas

Hawke's Bay	*Auckland*	*Christchurch*
Earthquake (e.g. 1931)	Volcanic Hazards	Earthquake (e.g. September 2010 and February 2011)
Flooding	Tropical cyclones	Tsunami
Local Tsunami	Floods	
Rural Wildfires	Tsunami	
Landslides and Coastal Erosion		

Source: www.civildefence.govt.nz

Another challenge experienced in the multiple case study is case competition for the researcher's attention. While having other cases at the back of one's mind to offer continued reflection, the researcher has to focus on individual cases in-depth to learn about the selfcentering, complexity and situational uniqueness. The researcher accorded enough time to each case study to address the concern where single cases and the collection of cases continually vie for attention, and often create some tension of "case-quintain dilemma" (Stake, 2006). Prior planning and collaboration with schools ensured that the challenge of balancing researcher's time between the individual cases and the overarching research goal was continually addressed. Ultimately the multiple case study approach offered an opportunity to the researcher to analyse within and across cases, and significantly covered different contextual conditions that substantially expand the generalisability of the findings to a broader array of contexts than a single case could have (Yin, 2009).

1.7.3 Access to child participants

The researcher initiated communication with schools by a phone call or email, and then later scheduled a meeting to present a research goal. Eight schools from the three regions expressed initial interest, although a degree of persistence was often required. One notable tension was some ethical prescriptions required by another school (later excluded) that were too cumbersome for the researcher to fulfil. The school principal was unwilling to initiate any engagement or discussion until ethical approval for the research had been obtained.

On the other hand, the institutional ethics committee board recommends obtaining and presenting supporting documents from potential schools and institutions as supporting documents for human ethics applications. This scenario at the initial stage of the research presented the researchers with a 'Catch 22' situation (Milne, 2005). To overcome these access challenges to vulnerable individuals, letters of support from accessing organisations are often required by funders and human ethics review boards, as was the case in this research. While this limited the total number of schools who were able to participate, three schools still consented to take part in the study.

The two prior school visits undertaken to initiate and seek access to children with disabilities as participants also helped ease access challenges as well as being a useful strategy vital for focus group interviews and observation of the students (Boggis, 2011). Often there are unique and difficult challenges when accessing children with disabilities for research (Nind, 2009; Boggis, 2011). For example, although parents and teachers were unanimous in agreeing to the significance and potential benefits of children participating, they still wanted to know how this could be achieved meaningfully. Because some children had diverse disabilities, which, according to general school records, could be one or more of autistic spectrum disorders, learning, hearing, seeing, mobility/physical disabilities and other degenerative conditions, the adults questioned their capability of being tasked with the challenge of assessing abstract concepts related to disaster risks, and making decisions within limited timeframes.

The schools allowed the researcher access to one class with children of diverse disabilities as workshop participants. These workshop participants (8-10 per school) were aged between 10-16 years and required some level of adult support. This was indicated by the high numbers of adult teacher-to-child ratios of between 1:2 and 1:4 in the three case study schools. During the workshop activities, the researcher and specialist teachers became research facilitators, providing children with clear, simplified but sufficient information, including pictorials, to support assent for children or consent for adults to participate. The specialist teachers were essential in clarifying some of the unclear verbal and non-verbal responses and engament by the students. While participatory techniques aim to ensure participants' involvement at all stages of research (Mercer et al., 2008), for children with disabilities in this study, ethical requirements and associated processes of access became a road block to their involvement in decision-making at the initial phase of formulating research methods.

Table 1.2: Focus group/workshop participants

Case study (School)	*Class size*	*Disabilities disclosed by each school*	*Associated challenges*
Christchurch	10	Autistic spectrum disorders; learning, visual, mobility difficulties and other degenerative conditions	Difficulties with comprehension, memory, communication, hearing, vision, relating to others, mobility issues, anxiety at changes in routines and obsessive-compulsive tendencies.
Hawke's Bay	8	Autistic spectrum disorders; learning, hearing, and mobility difficulties, and fragile X syndrome	
Auckland	9	Autistic spectrum disorders; learning and mobility difficulties, and other degenerative conditions	

Source: Case study schools

As research facilitators (researcher and specialist teachers), we ensured a shared understanding of objectives and the process of participation, including a clear description of the technique and their role in it. Research workshop activities were also conducted on the floor to limit eye contact and help attenuate power relations among adults and children (Mercer et al., 2008), as well as to avoid the risk of participants feeling pressured to take part. The significance of having alternative activities, prepared in conjunction with the specialist teachers, often became apparent when participants opted out before or during the course of an activity. For example, although all participants had given consent, an opting-out clause still stood.

Prior to the start of research, formal ethics approval was obtained from The University of Auckland, and consent (for adult) and assent (for children) was sought from all participants prior to study commencement. It was after the consent from their caregivers that children were approached for assent. Ironically, children with disabilities became the last in this complex chain of consent despite their eagerness to participate - their voices were only heard once the many layers of adult consent were negotiated (Boggis, 2011). Nevertheless, although the project goal was already defined by the researcher, and children came last to provide assent, the research still made use of flexible and inclusive participatory tools to empower children by giving them voice and greater participation in DRR research and to develop a sense of co-ownership of the outcome, as presented in the following section.

1.7.4 Data Collection Methods

This study used a number of data collection strategies, which are further detailed in Chapter 3. They are mainly participatory tools that include proportional piling, mapping and cut and paste activities, carried out in a workshop format or focus groups. Flexible participatory tools used enabled the children to express themselves openly and freely, and provide their own perspectives (Hancock and Algozzine, 2011). Semi-structured interviews were also used for both the children and adult participants. The researcher used participant observations during workshop and disaster drill activities.

Overall, to strengthen data evidence, Yin (2014) and Baxter and Jack (2009) advise the use of multiple sources suitable for case study research. These include focus groups, semi-structured interviews, participant observation, and relevant documents that eventually converge in a triangulation fashion and as one result. Various sources of data help in triangulation, ensuring more than one lens is used for revealing and understanding the multiple facets of a phenomenon (Baxter and Jack, 2008). Arguably, each data source, if used in isolation, limits the amount and accuracy of information that can be collected. Hence, multiple data sources permit the researcher to validate the findings obtained from one source through comparison with a second or a third source (Denzin, 1970). Data collection should involve a deliberate and vigorous search for ‘discrepant evidence’ and try to establish the potency of the plausible rival rather than discredit it (Patton, 2003; Yin, 2012). The qualitative data obtained through a naturalistic study provides ‘depth and detail’, consisting of detailed descriptions of situations, participants and interactions, quotations from participants, thoughts and experiences, and excerpts from documents or records (Patton, 1980; Placek, 1984).

Workshop/Focus Groups

The main sources of data collection in the multiple case study involved a range of focus groups undertaken in a workshop style format with the children. The researcher and specialist teachers took the role of workshop facilitators to garner the children’s perspectives and understandings related to DRR. Workshop activities and procedures were developed and adopted in all three study sites to ensure consistency. Facilitators in all three sites would meet to plan and prepare prior to the start of the workshops. In addition, the workshop process also provides team details, resources, and guidance on its facilitation, as described in Chapter 3. The focus groups incorporated flexible participatory tools to obtain children’s understanding of natural hazards. Workshops included proportional piling, mapping, and cut and paste activities in that order. The workshop activities involved mapping of safe and unsafe areas of their class and the school during a disaster, and children’s perception of safe and unsafe areas within their school environment were thus elicited (see Figure 1.2). The proportional piling of identified potential natural hazards in the region were pinpointed. These research activities were carried out within the geographical boundaries of the entire school – classes, playground and assembly ground. Specifically, the workshops took two hours a day, although this was split into multiple 20 minute sessions to accommodate the children’s attention span, as recommended by the specialist teachers. The workshops took four consecutive days in each of the three case study regions.

The proportional piling technique involved participants in identifying and listing of potential natural hazards around their school. The participants then transferred the list of hazards identified onto coloured A4 paper and placed them on the floor for proportional piling. Each participant was given three red, two orange, and one purple fruit-flavoured sweets to distribute to four potential hazards according to an agreed order: 1st (most dangerous) up to 5th (least dangerous) respectively, based on their individual perception of associated disaster risk. The total for each hazard was obtained for ranking. The fruit-flavoured sweets were chosen for the proportional piling activity with the aim of capturing children's interest in the activity. The different colours helped in guiding the distribution format /sequence of the sweets to the various potential natural hazards by the children.

Figure 1.2. Hawke's Bay School map: Safe and unsafe areas labelled with green and red pushpins respectively, as drawn by children with disabilities.

Two mapping activities were carried out during the workshop in each of the schools. One map represents their class and identifies safe and unsafe spaces should a natural hazard occur. Notably, participants proceeded with excitement to cut sponges/foams to size to represent their desk, then coloured them using different colours, and, with a coloured push pin, positioned it at their seating location. A green push pin signified a safe space while red meant a location perceived as unsafe in an earthquake. Participants were asked to locate their seating positions from the class map, guided by the facilitators. The second activity was to produce a tactile map of their school providing a combined visual and kinaesthetic spatial experience. This rendered the concepts more tangible or concrete for the children. The approach allowed exploring both the multiplicity and complexity of DRR research with children of diverse abilities.

Participant Observation

Participant observation was undertaken to examine a pre-arranged school disaster drill, including the actions of ‘drop, cover and hold’ to assess children’s preparedness. The disaster drills are organised by the school management in consultation with the teachers and take place ideally once a school term. A summary was then written to describe each day’s key observations, and answers to research questions. These observation/field notes were compiled as a detailed reflection of daily activities, thus helping to triangulate and increase the reliability of the evidence (Creswell, 2013). In addition, voice recordings (discussions) and photographs (maps) were taken. Memos were also useful in giving hints, clues and suggestions, basically to conceptualise the data as the research progressed. This was done with the original data in mind.

Semi-Structured Interviews

Used with other sources, such as mapping activities, interviews helped corroborate common problems of poor recall, bias and poor or inaccurate articulation, particularly with children with disabilities. Significantly, the interviews were to clarify observations, elicit information that was not obtained from the children and to document reviews. Careful wording of the interview questions helped to corroborate findings already established, as well as obtain interviewees’ perceptions and sense of meaning (Yin, 2014). The list of questions for the children were produced in consultation with the specialist teachers to ensure relevance and ease of understanding. On the other hand, semi-structured interviews for adults were used to gain information from the children’s caregivers, teachers and officials from Civil Defence and Emergency Management (CDEM), District Health Boards and Red Cross. Semi-structured interviews followed a set of flexible questions, and were conducted as guided conversations while still pursuing a consistent line of inquiry (Yin, 2014; Hancock and Algozzine, 2011), with the children, teachers, caregivers, and stakeholders in that order. The interview consisted of follow-up questions to clarify information obtained from the children.

Document Review

Various categories of documents were used to provide a rich source with which to augment data collected through interviews, participant observation and focus groups (Hancock and Algozzine, 2011). For example, the researcher reviewed the school fire and civil defence emergency procedure documents, the minutes of school health and safety meetings, local CDEM, and Red Cross community engagement guides. These documents became a useful source of information to provide the researcher with data from another angle; they contributed to data triangulation and thus helped in addressing key research questions.

1.7.5 Data analysis process

In a multiple case study design, the data analysis process starts with an initial detailed description of each case and the themes within ('within-the case' analysis). This is followed by a thematic analysis across the cases ('cross-case' analysis). The goal is to look for themes that transcend the case (Yin, 2009), to report or produce a case description or case themes: assertions (Stake, 1995), patterns or explanations (Yin, 2009), or an interpretation of the patterns (Creswell, 2013). Case study protocols are useful for ensuring both accuracy and that alternative explanations are arrived at for the purposes of validity and triangulation (Stake, 1995). Otherwise, Yin (1994) recommends using multiple sources of data for evidenced triangulation, which in turn increases the reliability of the data and the process of gathering it. The argument is that triangulations serve to corroborate data gathered from various sources (Yin, 2014), thus ensuring findings/evidence are supported by more than a single source. These were compared and contrasted vertically (within each case) and then horizontally (cross-case analysis) (Yin, 2014) to arrive at the final themes. The findings were then analysed in relation to the available literature on children, disabilities and disaster.

This study used two forms of triangulation (Figure 1.3): data triangulation (data remains the same in different contexts or when obtaining similar categories of data); and methodological triangulation (one approach followed by another) (Yin, 2014). Information was also obtained from the same child participants using different methods: focus groups, semi-structured interviews, and participant observations on different occasions, which also qualify as a set of "multiple" sources (Yin, 2014). Focus groups were the main approach to data collection since they incorporated simple participatory methods to engage the children to provide their perspectives and insights into their experiences of natural hazards and disaster risk. These were used in conjunction with interviews, participant observations and the use of documents to provide the needed triangulation regarding the children's experiences and perspectives in the face of natural hazards.

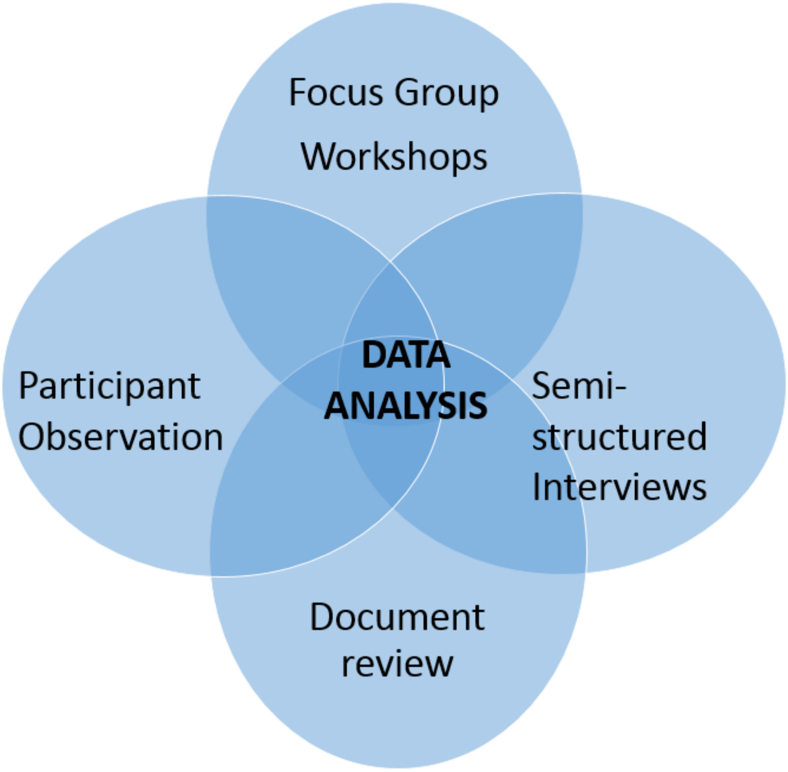

Figure 1.3. Data collection and triangulation process.

A case study approach allows for developing convergent evidence, and such data triangulation helps strengthen the construct validity of the case study since multiple perspectives and measures of the same phenomena are provided. That validity increases confidence that the case study findings are accurate (Yin, 2014). The approach also enables the current research to progress while keeping and creating a database of findings as a way of increasing their reliability through field notes, photographs, audio-recordings, and memo writing. The researcher jotted brief notes during workshop sessions, and detailed field notes were taken at the end of each workshop day. The daily reflection notes and memo writing (Berg, 2004; Yin, 2009) helped provide a detailed account of each day's activities and allowed a brief analysis of emerging issues/questions. Punch (2014) agrees that daily reflections and memo writing of ideas about codes and their relationships, may often point towards a new pattern (see Box 1.1), elaborate a concept or even produce propositions Repeatedly, potential questions were posed for further consideration both vertically and horizontally across the three cases (Yin, 2009).

Box 1.1 Christchurch school memo

18 September 2014: Research memo: (Day 3 Session 20)

Session 3 began with a recap of potential natural hazards in Christchurch – Earthquakes, Floods, Tornadoes, Volcanoes and Tsunami

One participant with excellent drawing skills volunteered to draw a map of the school using a 48 inch x 40 inch canvas. This drawing was initially done using a pencil, and after participants identified safe and unsafe areas, a felt pen was used to mark these areas. For example, spacious rooms, and those occupied by adult staff, buildings and classes made of timber, and an open playground were perceived as safe in an earthquake. Other places are a small rainbow room (relaxation room), the location of the 'swings' area, and for one student (Y) who enjoys painting, a small painting room.

Green stickers were used on the school map to identify safe areas and red identified unsafe areas.

Note: Perception of disaster risk

I have noticed an emerging pattern where rooms occupied by adults, and places of play, leisure or enjoyable experience are perceived as safe places by children. This mirrors a similar perception in the Auckland case study, e.g. where a tsunami was not viewed as a potential hazard. Teachers in Auckland pointed out that children often associate water with enjoyable swimming experiences and thus it is perceived as safe.

Other associated questions to consider while analysing the Hawke's Bay case study: (1) Do the skewed power relations between adults and children influence perception of safe and unsafe spaces? (2) How are the children's perceptions of disaster risk a challenge to the effectiveness of the design, rationale and delivery process of MCDEM resources, and to other DRR policies for effective access and use by children with disabilities?

This thesis used a combination of explanation building and cross-case synthesis, guided by thematic data analysis steps (Braun and Clark, 2006, 2013), with the aid of NVivo computer software. One of the strengths of qualitative research is to describe the processes that led to the outcomes (Maxwell, 1996). However, a challenge to the required rigour associated with a multi-case study "is the collection of overwhelming amounts of data that require management and analysis. Often, researchers find themselves 'lost' in the data". (Baxter and Jack, 2008, pp.554). A computerised data base is helpful to organise and manage large amounts of data. The NVivo software ensures a wide array of data, such as texts, maps and photographs, are used for data coding. Therefore, the software ensures the inquiry is thorough and the best possible outcome is achieved by interrogating interpretations; this helps maintain audit and log trails throughout the research process and provides a means of tracking decisions and assumptions (Richards, 2004; Siccama and Penna, 2008).

The process involved an initial detailed description of each case, and then searching for themes within the case followed by thematic analysis across themes. Cross-case synthesis becomes relevant and easier when the study has at least two case studies, hence arriving at more robust findings (Yin, 2014). This thesis is the result of case study write-ups and thus a product of answering key research questions, citing evidence from workshop activities, interviews, observations and relevant documents. Compilations of results presented primarily in publication format provide either a convergence of data or an appreciation of the participants' multiple realities and their tentative interpretations of natural hazards and disaster risk (Yin, 2012).

The thesis presents an approach that, together with the use of flexible participatory tools, is appropriate for accessing and researching vulnerable groups, which often are difficult to reach or engage with. The flexibility of the tools allowed facilitators to ensure participants took turns in contributing. This enabled, then 'collectivised', their perspectives and experiences. Also, with the teachers' support, children felt safe and developed confidence. The width and breadth of the case study analyses accommodate attending to all data collected and enable making use of all the evidence, including rival explanations. In so doing, it allows not only for answering the research questions but also for overlapping explanations, for example, the capacity, vulnerability and access to DRR resources among children with disabilities in a natural hazard or disaster experience. These findings, analysis and discussions are strategically presented as papers, as outlined below.

1.8 Thesis structure

This thesis is presented using the publication format. Following this introduction section, the subsequent chapters comprise papers either that are already published or manuscripts (two) currently under review. The introductory chapter, together with these papers and a conclusion section, form the comprehensive body of research that this thesis represents.

The thesis aims to provide new insights into the experiences, perceptions and needs of children with disabilities in the context of disaster risk particularly. Due to the multi-disciplinary nature of the study, which relied on children, disability, education and disaster fields, the publications targeted a fairly wide range of journals and a policy brief. These articles aim to make a significant contribution to the development of targeted DRR policies for integrating children with disabilities in line with both the School Safety Framework (UNESCO, 2013) and the (SFDRR, 2015).

The first article (Chapter 2) undertakes a review of the literature to identify gaps in disability inclusive of DRR, and highlights the existing research and knowledge gap. It emphasises the need for an understanding of the perceptions, experiences and needs of children with disabilities as a first step towards their involvement in DRR initiatives. The article reviews the key concepts of vulnerability, disability, and capacity, which are interconnected in determining access, or its lack, to resources vital for DRR. The paper points out that many planners tend to overlook people’s experiences of disaster and the different strategies they use to cope with and respond to disasters within the recovery process. Thus, the review specifically reinforces the need for disaster research that directly engages children with disabilities, and obtains their perspectives in DRR planning, something generally lacking in the academic literature.

The second article (Chapter 3) provides a rationale for using participatory tools to engage children with disabilities in DRR research. It argues for focus to be placed on flexible tools to bridge the participatory gap and suggests approaches that maximise children’s involvement that facilitate a two-way communication between children and adults (teachers, care givers and relevant stakeholders), and a greater understanding of and participation in DRR with children with disabilities.

The third article (Chapter 4) presents children’s perspectives and experiences of the February 2011 Christchurch earthquake. It critically examines the understanding, perception, experience, and preparedness of children with disability in the face of a disaster in the context of Christchurch. The paper reflects upon key concepts of vulnerability and capacity in relation to access to DRR resources and aims to contribute to the role of children with disabilities, in theory, research and practice. It calls for developing a framework that provides avenues for children’s involvement in initiatives that give a more accurate evidence base for informing improvements in DRR policy and practice.

The fourth article (Chapter 5) uses an inclusive lens to explore pathways, and considers, through the voices of children and adult participants, the complexities in implementing effective disaster risk reduction (DRR) in a school setting. It aims to contribute to ongoing DRR efforts by adding new information to the disaster literature on the role of schools in disability-inclusive DRR, identifying obstacles and suggesting policy recommendations that consider their needs in DRR.

The fifth article (Chapter 6) complements the findings of the preceding article by identifying, through the voice of both children and adult participants, associated gaps and constraints to disability-inclusive DRR. It highlights the centrality of the need for a shift in attitude and in managing skewed power relations (in favour of adults) where children with disabilities contribute to DRR initiatives. The paper makes recommendations that acknowledge diversity and ensures that children with disabilities (those marginalised) can become stakeholders.

The final chapter (Chapter 7) forms the thesis conclusion. The section ties together key research findings, highlights their unique contributions and their potential to shape future directions in DRR. It makes significant policy recommendations and suggests a conceptual framework that can help guide and identify possibilities for wider stakeholder collaboration, as well as facilitate the integration of children with disabilities for inclusive DRR policy and practice.

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Chapter 2. Children with Disabilities and Disaster Risk Reduction: A Review

Ronoh, S., Gaillard J.C. and Marlowe J. (2015). Children with disabilities and disaster risk reduction: A review. International Journal of Disaster Risk Science 6(1): 38-48.

Abstract

Children with disabilities are often excluded from disaster risk reduction (DRR) initiatives and, as a result, can experience amplified physical, psychological, and educational vulnerabilities. Research on children with disabilities during disasters is lacking, and their potential value in helping shape inclusive policies in DRR planning has been largely overlooked by both researchers and policymakers. This article highlights the existing research and knowledge gap. The review includes literature from two areas of scholarship in relation to disasters—children, and people with disabilities—and provides a critique of the prevailing medical, economic, and social discourses that conceptualize disability and associated implications for DRR. The article analyzes the different models in which disability has been conceptualized, and the role this has played in the inclusion or exclusion of children with disabilities in DRR activities and in determining access to necessary resources in the face of disaster. Finally, the study explores possible pathways to studying the contribution and involvement of children with disabilities in DRR.

Keywords. Children with disabilities; Disability concepts; Disaster risk reduction; Vulnerability

2.1 Introduction: Children, Disabilities, and Disasters

The United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) adopted in 2006 was the first significant human rights instrument aimed at protecting and promoting the fundamental rights of persons with disabilities (UNCRPD, 2006). This convention builds and elaborates on rights already set out in the World Programme of Action Concerning Disabled Persons of 1982, and the 1993 Standard Rules for the Equalization of Opportunities for Persons with Disabilities, among other United Nations (UN) human rights instruments

(Barnes and Mercer, 2001). The associated principles are based on respecting differences and accepting people with disabilities as part of a diverse human society. The Millennium Development Goals (MDGs) 2000, and the Hyogo Framework for Action (HFA) 2005–2015 policy frameworks also place emphasis on enhancing commitment to the management of risks and adopting a human rights approach. States would fulfil their obligations to respect, protect, and fulfil basic human rights, including the rights to safety of vulnerable people exposed to hazards.

The rise in the occurrence of disasters and their related impact on people is a growing concern in the international community. Yet, (Smith et al., 2012) argue that the HFA and the latest MDGs 2012, for example, make no mention of the large number of children with disabilities who are out of school, and are also significantly affected by disasters (Peek and Stough, 2010). According to the World Health Organization (WHO, 2007), about 10% or 200 million of the world's children have a form of disability. These children often require additional educational and physical support and spend much of their school day under the direct supervision of a special educator (UNICEF, 2007). Peek and Stough (2010) estimate that over seven million children annually are affected by disasters worldwide. Millions more acquire disabilities during childhood as a consequence of disasters (Peek and Stough, 2010).

The disaster literature highlights the effects of natural hazards on children as a vulnerable group in society generally (Anderson, 2005; Wisner, 2006; UNICEF, 2007; Peek, 2008; MCDEM, 2009; Gaillard and Pangilinan, 2010). But researchers rarely examine the experiences of children with disabilities during disasters, regardless of their disability type (Peek and Stoug, 2010; Boon et al., 2011). As a result, children with disabilities are overlooked in DRR planning. The lack of research that focuses on children with disabilities, and their limited involvement with DRR planning, reinforces a sense that they are inherently vulnerable. Their knowledge is frequently derided as emotional and lacking validity (Crow, 1996), and often perceived to have little to offer in terms of developing effective DRR.

A problem with effective inclusive participation in DRR is that people with disabilities are at the mercy of other people's "construction of what it means to have a disability" (Hodkinson, 2007, p. 59). The term "children with disabilities," for example, is poorly articulated and means different things to different people (Aron and Loprest, 2012). The lack of understanding and clarity on the use of the term partly contributes to the current exclusion of children with disabilities from participation in DRR activities. Consequently, the problems with the potential vulnerabilities of children with disabilities during disasters are poorly understood—the children are largely portrayed as "helpless" in the face of disaster (Hahn, 1985; Smith et al., 2012; Aron and Loprest, 2012). This article explores the existing research and knowledge gap related to policy and practice with respect to how children with disabilities are affected by disasters. Smith et al. (2012) pointed out that the potential value of children with disabilities in helping shape inclusive policies in DRR planning has been largely ignored by both researchers and policymakers. This article builds on Peek and Stough's (2010) pioneering work of a social vulnerability assessment and contributing vulnerability factors. It analyses different models in which disability has been conceptualized and the role this plays in excluding children with disabilities in DRR activities and in determining access to necessary resources in the face of disaster. The following section first examines the concepts of vulnerability and disability, and discusses experiences of children with disabilities in disaster contexts.

2.2 The Concept of Vulnerability in the Context of Disaster

Disaster has been described in various ways by different researchers. However, the literature describing disasters has some common themes. They range from the suddenness of disasters and the inability of existing systems to cope, to widespread deaths, injuries, and economic losses, and lack of immediate access to livelihood resources. The literature also includes small or low-intensity and lingering events associated with droughts and conflicts (Peek, 2008; Philips et al., 2010; Mutch, 2013). For the purpose of this article, a disaster situation refers to a natural hazard that has consequences in terms of damages, livelihood/economic disruptions, and/or casualties that are too great for the affected area and people to deal with adequately on their own (Wisner et al., 2012).

The concept of vulnerability has been the subject of intense debate and interpretation among various schools of thought. The concept is often used in divergent ways, for different purposes (Bankoff et al., 2004), and sometimes out of its original theoretical framework; vulnerability is viewed as a social construct associated with fragility in the face of natural hazard (Gaillard, 2010). Peek (2008) notes that previous research attributes vulnerability and exposure to natural hazards to intersections between key environmental and social indicators that include: the quality of human settlements and the built environment, socioeconomic status, gender, race, ethnicity, age, disability and health status, occupation, education, access to resources, social networks, and social dependence. In the disaster context, the term vulnerability has been used to refer to susceptibility to suffer damage in a potentially dangerous natural event (Gaillard, 2010). The term denotes the degree to which one's social status (for example, culturally and socially constructed in terms of roles, responsibilities, rights, duties, and expectations concerning behaviour) influences differing effects of natural hazards and the social processes that lead to and maintain that status (Wisner et al., 2012).

From that viewpoint, both disaster researchers and practitioners identify children, the elderly, women, racial and ethnic minorities, the poor, persons with disabilities, and immigrants as especially vulnerable to the harmful effects of disasters (Wisner et al., 2004; Kailes and Enders, 2007; Philips et al., 2010). Additionally, the implication is that individuals and communities may be vulnerable geographically because they often live in hazardous places (for example, coastal zones, seismic areas) due to lack of better access to land, and may be poor, lacking the resources to invest in protective measures, and lacking the savings to face crises. People may be vulnerable socially because they are part of a minority group, have limited access to social protection, and have weak social networks (Wisner et al., 2004).

Vulnerability accrues from the various components that comprise a given society—the social, economic, and political structures or systems. These can make hazard occurrences a crisis or disaster (Wisner et al., 2004). Vulnerability is attributed to limited or no access to vital day-to-day resources, and poor and unstable access to resources results in marginalization in daily life and in facing natural hazards (Gaillard and Maceda, 2009). The root causes of vulnerability stem from social structures that can be traced historically to explain the ideological and cultural assumptions that give those structures their perceived legitimacy (Wisner et al., 2012). These structures determine both the availability of and access to resources, and the means of protection in DRR. Consequently, the lack of access to vital day-to-day resources—natural, social, economic, physical, and human—often undermines the required capacity in the face of a disaster and for coping and recovering in its aftermath (Wisner et al., 2012). The following section describes how children with disabilities face disaster and identifies how potential vulnerabilities are largely determined by access to necessary resources and assets.

2.3 Children with Disabilities and their Experiences of Disasters

The literature on disasters suggests that children are a vulnerable group and often disasters have occurred when the children are in school (King et al., 2003; Peek and Stough, 2010; Boon et al., 2011). Some examples include the 2001 Gujarat earthquake in India, the 2005 Kashmir earthquake, and the 2008 Wenchuan earthquake in Sichuan, China, where school children were killed or injured in large numbers (UNICEF, 2010). The Wenchuan earthquake struck during the early afternoon on a weekday, when effectively every school-aged child in Sichuan Province was in a classroom. This earthquake damaged or destroyed 12,000 school buildings in Sichuan Province and 6,500 school buildings in Gansu Province, disrupting the education of some 2.5 million children (Peek, 2008; UNICEF, 2010).

Similarly, in New Zealand the 2011 Christchurch earthquake occurred at 12:51 p.m., a time when all children are expected to be in school. Effects included school closures, demolitions, power cuts, and the establishment of temporary school sites following the earthquake (Mutch, 2013). Although specific research on the disaster effects on children with disabilities and schools is lacking, the timing of many disasters means that these children can be significantly affected.

Disaster researchers agree that, for children with disabilities, vulnerability in facing natural hazards can be exacerbated by factors that include mobility difficulties, pre-existing medical conditions, and existing social and physical structures and policies (King et al., 2003; Peek and Stough, 2010; Boon et al., 2011). Some children with disabilities may have pre-existing medical conditions, suffer from life-threatening consequences due to separation from caregivers, and be prone to illness, malnutrition, and abuse when disaster strikes (Boon et al., 2011). They may acquire additional impairments and experience additional health issues as a result of inadequately staffed shelters that are not prepared to meet their medical needs (Lemyre et al., 2009). Children with autism-spectrum disorders have sensory integration problems that may include high sensitivity to light, sounds, odors, tastes, and touch making them particularly vulnerable during disasters (Boon et al., 2011).

Physical disabilities can limit children’s effective responses to disaster. For example, none of the 700 people with post-polio paralysis on an island of the Andaman archipelago in the Bay of Bengal survived the 2004 tsunami because they were unable to run to the top of the surrounding hills (Hans et al., 2008; Alexander et al., 2012). Children with disabilities in schools managed by an Indonesian society caring for children with disabilities in Banda Aceh were all killed as well by the same tsunami (CIR, 2005). In Haiti, a country where people with disabilities are commonly known as "Kokobes" ("good for nothings"), hundreds of children lost their limbs from crashes during the 2010 earthquake, while others underwent amputation as a result of secondary infections (Alexander et al., 2012).

Reviewing existing literature on children with disabilities, Peek and Stough (2010) identified some of the common risk factors in children with disabilities that increase the probability of negative physical effects on these children during disasters. These include the likelihood that they live in poverty and in low-cost and lower-quality housing that is more prone to damage or collapse. Murray (2011) also noted that these children, especially in less affluent countries, grow up in communities affected by poverty, live in below-standard housing, and are left without the resources to evacuate when disasters strike. This consideration is particularly important given that sudden-onset hazards like tornadoes and earthquakes give little warning to allow those with disabilities to take recommended protective actions or escape, particularly children with mobility limitations (Peek and Stough, 2010).

Limited language proficiency, both oral and written, is also common for children with disabilities (Murray, 2011). Children with hearing difficulties are disadvantaged when oral directions are given unaccompanied by sign language. This can affect how quickly a child becomes aware of an (impending) disaster, their access to emergency information during a disaster, and their ability to ask for assistance (Campbell et al., 2009; Boon et al., 2011). In Galle, Sri Lanka, for example, only 41 out of 102 residents of a home for people with disabilities survived the 2004 tsunami. According to the International Federation of Red Cross and Red Crescent Societies (IFRC, 2007), the residents were either unable to leave or failed to understand the need to evacuate in time.

Social distancing or stigma associated with the label "disabled" may further limit access to vital resources, social networks, and other sources of psychological support during a disaster, or make it difficult for a child with a disability to adjust emotionally to a new neighbourhood or community (Tierney et al., 1988). Families caring for children with disabilities remain vulnerable in facing disaster because disabilities are strongly associated with social, structural, and financial disadvantage (AIHW, 2009). Boon et al. (2011) also maintain that children with disabilities are more likely to experience intra- and extra-familial abuse and neglect generally, a risk that is particularly amplified during a disaster and its aftermath (AIHW, 2009). Children with disabilities, who may already have limited social networks, are often separated from caregivers during a disaster. This deprives the children of critical information and support, and disrupts the continuity of medical care (Baker et al., 2012).

Another crucial factor is that people and children with disabilities are often overlooked during emergency preparations and in DRR policy at large, leaving them unprepared for emergency. The lack of knowledge about disabilities is intrinsically linked to the exclusion of people with disabilities from DRR activities (Smith et al., 2012). They are without a "political voice" and this means that their views and the issues that characterize children with disabilities are not considered (Wisner et al., 2004; Anderson, 2005). This neglect of people and children with disabilities in emergency preparation limits their capacity to effectively participate and contribute to society. Wisner (2002, p. 4) argued that:

> *... at the heart of the disability rights movement have been legal challenges to the lack of "access" and "equal opportunity" in a world that had constructed itself around the abilities and needs of people without impairments in mobility, hearing, sight, speech, stamina, cognition, mental or emotional stability.*

Admittedly, an increasing amount of work has been directed at researching disaster experiences of children and youth generally, not only research for or with children but also by children (Save the Children, 2006; Stough, 2009; Peek and Stough, 2010; UNICEF, 2010; Mutch, 2013). Examples have emerged internationally of children’s capacity to actively contribute to planning, preparedness, response, and recovery efforts, and the apparent positive mental health benefits of these involvements (Save the Children, 2006; Wisner, 2006; Mutch, 2013). Research on disabilities and disasters, however, has only focused on adult populations (Stough, 2009; Handicap International, 2009; MCDEM, 2013). In response to the 2011 Christchurch earthquake the New Zealand, for example, the government (MCDEM, 2013), published an important document *Including People with Disabilities,* but this document only focuses on adults with disabilities (MCDEM, 2013). Two research parallels have since emerged: one that focuses on children and another that focuses on adults with disabilities. This leaves a knowledge gap in-between of the experiences of children with disabilities in disasters (Peek and Stough, 2010).

Although there is evidence suggesting that children are being increasingly involved in DRR decision making, growth has been slower with respect to children with disabilities (Franklin and Sloper, 2009). The literature shows that many organizations have, in theory, produced sound policies and procedures that acknowledge the need to involve children in decision making; but little or no change has occurred in practice. Turnbull et al. (2001) and (Priestley and Hemingway 2007) have aptly summed up the situation that laws are created and remain on paper, "that is to say statutes and cases create claims to certain kinds of services, but they do not themselves ensure that services are delivered" (Turnbull et al., 2001, p. 143). In practice, policy and planning continues to remain at "helping the disabled" individual to adjust and accept the existing environment, rather than altering the environment to accommodate the needs of individuals with disabilities (Hahn, 1985, Kailes and Enders, 2007).

This situation creates an urgent need for evidence-based research to explore the experiences of children with disabilities in disasters, and the role disability conceptualization plays in overlooking their capacity and potential contribution to DRR. Addressing this largely neglected focus will allow planners to consider the needs of children with disabilities in DRR initiatives.

2.4 Conceptualizing Disability

The way disability has been conceptualized and poorly articulated exposes a persistent lack of clarity and understanding of the terminology (Hodkinson, 2007; Aron and Loprest, 2012). Consequently, the exclusion of people with disabilities from participation in DRR activities is partly due to the lack of a clear and consistent articulation of the terminology. The term "disability" is broad, with varying taxonomies that are socially constructed and defined by medical, economic, and social assessments and discourses (Bankoff et al., 2004; Birkman, 2006; Peek and Stough, 2010; Watson et al., 2012). All three approaches to conceptualizing disability can negatively affect DRR.

The medical model approach views disability as a natural consequence of impairment rather than a condition caused by society. This standpoint ignores structural and cultural barriers that block the inclusion of children with disabilities in disaster preparedness initiatives. Priestley (1998) argued that professionals give more attention to measuring children's bodies and minds, and less to facilitating their inclusion into society. The limitation of the medical model approach is its preoccupation with "inability" or "limitations" of individuals without due considerations to modifying the physical environment, changing occupational "roles and tasks," or altering the expectation that all men and women are required to possess a full range of physical, mental, and environmental capacities to qualify for membership in the human community (Hans et al., 2008). The demand appears to be for people with disabilities to adapt and adjust to the surroundings without imposing a corresponding obligation on policymakers to create an environment that can accommodate the needs and desires of people with disabilities (Watson, 2012).

The economic model of disability focuses on the economic problem of unemployment and the associated costs of disability, placing primary emphasis on physical functioning. The approach suggests that disability can be described as a "health-related inability" or limitation on the amount or kind of work that can be performed (Hans et al., 2008). This viewpoint has been widely adopted in public policy-related issues, and seems to reflect the prevalent tendency in an industrialized society to stipulate physical capabilities as occupational requirements (Hahn, 1993). This model might be appropriate where an economy is solely based on manual labour rather than on the contemporary delivery of services and involvement in high technologies. There is a biased focus towards "roles and tasks" associated with work to the exclusion of other rights and responsibilities, or their capacities. Watson et.al. (2012) underscore the expectation that individuals with disabilities need to fulfil existing requirements for employment, without the option or possibility of altering the job expectations to accommodate the needs and skills of employees with disabilities.

The social model is informed by the idea that disability is centrally structured by social oppression, inequality, and exclusion (Thomas, 2004) and is viewed alongside sexism, racism, and other discriminatory practices (Watson et al., 2012). This approach views disability as stemming from the failure of a structured social environment to adjust to the needs and aspirations of citizens with disabilities, rather than from individual failings or inabilities to adapt to societal demands (Hans et al., 2008). The social model is explicitly committed to assisting people with disabilities in their fight for full equality, social inclusion, participation, and involvement in community activities (Crow, 1996). Significantly, this model argues that disability is not due to impairment, but rather is caused by barriers erected by a disabling society through collective thinking and action (Thomas, 2004).

Disability scholars concur that no model, including the social model, can totally explain disability (Pfeiffer, 2001). Acknowledging the causal link between impairment and disability offers a significant point of convergence between the models. Therefore, a possible way forward is incorporating the medical model's view that impairment and illness have disabling effects (Crow, 1996; Thomas, 2004) and the social model's view that urges the integration of people with disabilities into the community as a more equitable and practical alternative to exclusion (Pfeiffer, 2001), and thus promotes their involvement in DRR. Since there is no single DRR strategy suitable for all types of disabilities (Kailes and Enders, 2007), some researchers propose a functional-needs approach of defining disability in disaster. This would be an approach that highlights the support the individual may need in areas of communication, medical care, functional independence, supervision, and transportation (Kailes and Enders, 2007). Such an approach is particularly useful in the vulnerability and capacity assessment in the face of disaster, a concept discussed in the next section.

2.5 The Concept of Capacity in the Context of Disaster

Another key concept is capacity, which Cadag and Gaillard (2014) define as the set of knowledge, skills, and resources people resort to in dealing with natural hazards and disasters. Individuals and communities have generally developed intrinsic abilities to learn and adjust, using different skills and sources of knowledge and self-organization, and involving social networks and institutional linkages that help them in the face of disaster (Haque and Etkin, 2007). Coping mechanisms and other strategies used to face natural hazards are usually rooted in people's everyday livelihoods (Haque and Etkin, 2007). More importantly, the emphasis is that capacities not only refer to available resources but more crucially to their access. Kuban and Mackenzie-Carey (2001) pointed out that the capacity concept encompasses the ability to either use or access the resources needed. The concept therefore goes beyond the availability of resources and is not the opposite of vulnerability on a single, linear spectrum (Wisner et al., 2012).

Capacities are often rooted in resources and assets that are largely endogenous to the community facing hazards. In contrast, vulnerability emphasises structural constraints which are often exogenous to the community and include inequalities in distribution of power and wealth as well as the structure of local and global social and political systems (Gaillard, 2010). The endogenous nature of resources that compose capacities (for example, local and/or indigenous knowledge and networks) makes it easier to enhance the production and formation of individual and collective capacities than to reduce vulnerabilities. It encompasses participating in activities, often at the household, school, or community level, which strengthens people's strategies for facing the occurrence of natural hazards. Examples include agreeing on warning signals for potential hazards and associated protective actions, planning evacuation routes and meeting points, identifying vehicles and shelters, and preparing emergency kits and resources to cope with the disruption of daily life (Wisner et.al, 2012).

For children with disabilities, access to vital day-to-day resources ultimately determines their ability to face a disaster. However, it may not be practical to place a clear boundary around the child when describing access to resources, and the associated level of involvement. McConachie and Diggle (2007) argued that often child participation and experiences occur as part of a family, school, or community with adult support. Possible pathways towards studying and linking capacities and the potential contribution to DRR need to be explored and challenges to their involvement identified. For example, the existing heterogeneity among children with disabilities implies a wide array of potential capacities alongside an awareness of vulnerabilities that need to be explored.

2.6 Next Steps: Exploring Children with Disabilities' Potential Contribution to Disaster Risk Reduction

Despite researchers acknowledging that children with disabilities have not been actively involved in DRR planning (Peek and Stough, 2010; Boon et al., 2011; Alexander et al., 2012), few studies have assessed the perceived barriers to children with disabilities' involvement in school or community activities (Law et al., 2007; Franklin and Sloper, 2009). This lack of information about and meaningful engagement with children who have disabilities creates additional barriers to their participation in DRR planning. Peek (2008) outlined three ways in which children generally can be involved in DRR activities. They include preparing for disaster through school-based hazard education programs and sharing children’s understanding within the community to increase accurate knowledge of hazards and the required risk reduction strategies. The second way is to promote children’s involvement in responding to disaster; Peek (2008) provided examples of children who warned and convinced their own families and tourists of the impending tsunami threats in Thailand in 2004. Third is the children’s involvement in recovery and the recovery of those around them.

Nonetheless, researchers realize that research on children with disabilities remains complex due to the diverse ways in which disability is conceptualized and the children’s depiction as "helpless" in disaster (Hahn, 1985; Aron and Loprest, 2012). This perception is a cultural construction of incompetence and dependence that masks the children’s actual capacities (Woodhouse, 2004). On the contrary, almost everyone, including children with disabilities, usually has some capacity for self-protection and group action. Children possess the capacity to resist, avoid, and adapt to the processes of disaster preparation and response, and to use their abilities for creating security, either before a disaster occurs or during its aftermath (Wisner et al., 2012).

A review of the daily experiences of children with disabilities (Heah et al., 2007) highlighted their potential capacities (both individual and collective) during disaster. Even when directly affected by disaster, children can and often do cope effectively with disruptive shocks, especially with appropriate support from parents/caregivers and when living in a safe and nurturing environment (Peek and Stough, 2010). In addition, many schools offer both formal and informal DRR activities. When children receive information about hazard risks they can share their knowledge with their families and communities (Wisner, 2006), and ultimately prompt positive change and realistic risk perceptions (Peek, 2008). They can also be role models, motivators, and resource persons for those newly injured in a disaster (Handicap International, 2009).

Children with disabilities negotiate altered and sometimes difficult physical and environmental limitations on a daily basis (UNISDR, 2013). Thus, they often operate with heightened complementary senses (for example, individuals who are blind develop an acute sense of hearing). Some people with disabilities have enhanced tactile sense and are often able to navigate in the dark; this provides them with a "psychological advantage" that makes them less likely to become injured or to panic during and after a disaster (UNISDR, 2013, p. 28). The counterargument is that persons with certain types of impairments are more prone to stress in altered environments unfamiliar to them (UNISDR, 2013). This calls for research that engages children who have diverse disabilities and identifies their potential role in DRR.

Children with disabilities are knowledgeable and can be innovative and creative in times of disaster (James and Prout, 1990; Bender et al., 2007; Peek, 2008). They should be viewed as actively involved in the construction of their own life (and the lives of those around them). Different children use or give different meaning to the same cultural artefacts (James and Prout, 1990). For example, they can be involved in school hazard identification and mapping, or other DRR activities. Although in the social context parents can sometimes provide insight into their child’s situation, Garth and Aroni (2003) insisted that children’s understanding and experience of the world is different from that of their parents and that children with disabilities are able to identify "good practice" too. They are resourceful in their schools and communities, and have the capacity to influence family members and friends as valuable risk communicators (Peek, 2008). However, while disasters often harm their physical spaces—where they live, learn, and play—they are rarely involved in the process of rebuilding these spaces.

A point of convergence among researchers is the acknowledgment that children’s involvement in structured school or community activities reduces behavioural and emotional problems, particularly in children living in high-risk environments, for example, poverty-ridden and high-crime neighbourhoods (Law et al., 2007; Boon et al., 2011). Mutch (2013) proposed a continuum of engagement of children in research on, about, with, and by children, while Peek and Stough (2010) emphasized the need for their active involvement and consideration in all DRR activities to mitigate disaster effects. Useful DRR programs can involve children in mapping risks in their school, and undertaking hazard minimization strategies and disaster simulation (Wisner, 2006; Mutch, 2013). Participation in such activities provides children with the challenge to not only come up with local solutions, but to recognize and seek necessary external support. That means that some of the activities they may participate in could include identifying evacuation routes and equipment, potential hazards, alert and communication methods, and as trained assistants for individuals with disabilities. The advantage is that schools have been found to encourage participation by promoting caring relationships, buddy systems among peers, and welcoming attitudes (Law et al., 2007; Mutch, 2014). This positions schools as strategic entry-points for research that involves the role of children with disabilities in the DRR agenda (Wisner, 2006).

2.7 Obstacles to Involving Children with Disabilities in Disaster Risk Reduction

Recent disasters have revealed complexities in the associated responses when considering the needs of potentially vulnerable populations (Redlener, 2008; Baker et al., 2012). Research suggests that people differ significantly in their degree of vulnerability to natural hazards (Anderson, 2005), and this subsequently influences their level of involvement in DRR. Experts argue that significant inequality exists in vulnerability levels even when the physical dimensions of particular threats are similar (Cannon, 1994; Anderson, 2005; Peek and Stough, 2010). Wisner et al. (2012) broadly attributed vulnerability to poor and unstable access to resources resulting in marginalization in daily life and in facing natural hazards. Inequitable distribution of resources within the society is largely determined by historical social structures, and the ideological and cultural assumptions giving those structures their perceived legitimacy. These are structures that in effect are the root causes of vulnerability.

Those marginalized and vulnerable in facing hazards are often also those who struggle in the aftermath of disasters. The financial burden of caring for people with disabilities is carried by families and local communities. Families caring for children with a disability are associated with social, structural, and financial disadvantages and low incomes (AIHW, 2009; Peek and Stough, 2010; Alexander et al., 2012). Disability overlaps the clusters referred to as "class" and "age" and the vast majority of people with disabilities are also poor (Wisner et al., 2012). Moreover, those with serious health conditions may have limited social networks and higher dependency for external assistance in a disaster situation. Without appropriate intervention from the authorities and supporting organizations, people with disabilities can have amplified vulnerabilities in disaster contexts and diminished capacities (Gaillard and Cadag, 2009). Specific to children with disabilities, their age intersects with other personal and social characteristics, such as their geographical location, family structure, socioeconomic status, physical and mental abilities, culture, stage of development, and nationality. These characteristics determine both the likelihood of harm in a particular disaster and their link to potential challenges with respect to the children’s involvement in DRR.

Overlooking children with disabilities in DRR activities significantly contributes to their vulnerability. Their involvement in school and community activities, for example, is often hampered by one or a combination of factors that may include children having very limited or no use of speech or being seen as having high or multiple levels of impairment. However, Franklin and Sloper (2009) noted that little effort is made to find alternative methods of communication. While researching children with visual impairments and their comprehension of surrounding space, Andreaou and McCall (2010) described them as part of a population that is very heterogeneous and often cannot be classified into a single group or category. Even specific impairments—such as visual and hearing impairments—range in severity from mildly impaired to totally blind or profoundly deaf (Odom et al. 2005). This implies the need to consider a wide array of vulnerabilities and capacities based on access to resources in relation to DRR planning. A starting point for involving children with disabilities in DRR initiatives is researching their experiences in the face of disaster, and subsequently designing policies that consider their potential contribution.

Involving children in a decision-making process takes time and slows down the process. It involves adults and children developing new skills, requires investment of resources, and often entails a major shift in attitude within organizations and in power relations where children are viewed as incompetent and in need of protection (Franklin and Sloper, 2009), instead of providing them with access to resources. At one level, one may agree with the argument not to expect young children and, more so, those with disabilities, to understand complex decision-making processes, thus raising important issues to ponder. However, the United Nations Convention on the Rights of the Child acknowledges that “children hold the right to express their opinion about issues affecting them and to have their views heard" (Hodkinson 2007, p. 70). Mahon et al. (1996) observed that valid accounts of children’s experiences require direct engagement with the children and treating them as independent actors. This statement does not take away the concern over their capability—for example, of children with cognitive impairment—to be actively involved and to be able to understand concepts of decision making. The process of weighing options and choosing abstract concepts and time frames (Franklin and Sloper, 2009) is often required in DRR planning. There is a need for research that explores the complex array of diverse disabilities to capture insights, realities, obstacles, and potentials for involvement.

Mahon et al. (1996) argued that, because children are perceived as vulnerable and not competent, this justifies the use of proxies as children’s representatives to articulate their issues (Mahon et al., 1996, p. 145). Anderson (2005) contended that DRR research on children with disabilities has lagged behind, mainly as a result of their status in society. Children with disabilities are seen as unable to make choices and require their lives to be structured and controlled by adults (Watson et al., 2012). Shakespeare and Watson (1998) argued that traditional approaches in social work, health, and education tend to concentrate on children with disabilities' "need for care," highlight their "dependent" status, and emphasize their vulnerability. These attitudes and the lack of social support—including bullying, social segregation, and marginalization—remain potent barriers to the children's participation, thus making them isolated and wary of participation in school and community events (Law et al., 2007).

Researchers have also identified the physical environment as a limitation to effective involvement of children with disabilities. Findings by King et al. (2003) suggested that the physical environment has historically been influenced by the characteristics or needs of persons without disabilities. Watson et al. (2012) pointed out that although aspects of the environment including architecture, communications, and other settings offer a context for social interaction, they are fundamentally moulded by public policy. These environments often possess inherent adult designs and values and remain restrictive to children with disabilities who encounter restricting physical environments and find themselves unable to integrate into the broader community (Thompson and Philo, 2004). Hans et al. (2008) observed that the solution to the problems posed by disability must be achieved by policy changes that affect the environment, rather than by an exclusive reliance on alterations of the functional or economic capabilities of individuals with disabilities. In the same vein, questions need to be asked about whether disaster preparedness policies reflect only adult expectations without regard to children's viewpoints and hence affect the children's contribution to DRR. Deeper understandings of these issues, informed by children's voices, can give policymakers and practitioners the opportunity to design appropriate interventions in DRR initiatives.

2.8 Conclusion

The limited research focused on children with disabilities during disasters highlights a pressing need for further study to assess and understand effective pathways for ensuring active participation of children with disabilities, both at school and in the community (Mihaylov et al., 2004). No field research specific to the experiences of children with disabilities in response to disaster has been undertaken (Peek and Stough, 2010; Boon et al., 2011). Children with disabilities have been overlooked in DRR initiatives and may also have difficulties obtaining access to resources in the face of disasters, thus making them potentially vulnerable when facing natural and other hazards.

This article has reviewed the concepts of vulnerability, disability, and capacity, which are interconnected in determining access, or its lack, to resources vital for DRR. It has critiqued the different ways in which disability is conceptualized and argues that the medical, economic and, to a lesser extent, social model of conceptualization play a role in excluding children with disabilities in DRR initiatives. This exclusion, together with the vulnerability that stems from social, political, and economic structures/systems, limits their access to necessary resources required in facing disaster (Hans et al., 2008; Wisner et al., 2012).

The article notes the capacity concept's emphasis on access to resources and assets needed during a disaster (Wisner et al., 2004). The argument is that capacities are often rooted in resources that are largely endogenous to the community facing hazards, as opposed to vulnerability, which is exogenous and emphasizes structural constraints (Gaillard, 2010). The larger problem, however, is that prevailing discourses on disability and vulnerability are often focused on individuals rather than on structure. There is little structural will to address the implications of DRR for children with disabilities because they are rendered largely invisible by the society and its economically fundamentalist social policies. It is therefore important for disaster researchers to first identify and recognize the capacities specific to children with disabilities to enable DRR planners to develop strategies that make use of these capacities.

For children with disabilities, an opportunity for their inclusion in DRR initiatives would enhance their participation and their capacity to face and contribute during a disaster. Understanding context-specific vulnerabilities and capacities can help researchers, educators, communities, policymakers, and families to develop targeted strategies for promoting involvement (Law et al., 2007), and strengthen their role in DRR. This kind of information will also contribute to the body of knowledge and a significant understanding of effective strategies for mitigating disaster risks.

Many planners tend to overlook people's experiences of disaster and the different strategies they use to cope with and respond to disasters within the recovery process. An understanding of the experiences of children with disabilities remains the first step towards their involvement in DRR initiatives. This review specifically reinforces the need for disaster research that directly engages children with disabilities, and obtains their perspectives in DRR planning, something currently invisible in academic literature.

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Chapter 3. Bridging the Participatory Gap: Children with disabilities and Disaster Risk Reduction

Ronoh S., Gaillard J.C., and Marlowe, J. (2017) Bridging the Participatory Gap: Children with disabilities and Disaster Risk Reduction. International Journal of Mass Emergencies and Disasters (In press)

Abstract

Disaster risk reduction (DRR) needs to be inclusive. However, potentially vulnerable groups such as children with disabilities are often excluded. Their perceptions and views are overlooked due to existing structural forms of exclusion and lack of inclusive methods that enable children to effectively contribute to DRR. This paper provides an insight into understanding the complexities of DRR participation among twenty-seven children with disabilities from three case study schools in New Zealand. It explores the notion of 'participation' through flexible participatory tools. It involved mapping of safe and unsafe areas of their class and the school during a disaster, and proportional piling activities representing identified potential natural hazards in their region. The approach was able to accommodate and permit a sustained continuum of engagement among children with diverse disabilities, capacities and experiences. Crucially, it offers a bridge that recognises communication as a two-way process between adults and children, where adults learn how children express their views, thus according them a voice in DRR.

Keywords: *Children with disabilities, disaster risk reduction, natural hazards, participatory tools, capacities.*

3.1 Introduction

Despite the growing body of literature on involving children generally in Disaster Risk Reduction (DRR) (Boon et al., 2011; Christ and Christ, 2006; Haynes and Tanner, 2015; McAdams and Stough, 2011; Peek, 2008; Ronoh et al., 2015a), less is known about specific factors that assist active participation of children with disabilities (Franklin and Sloper, 2009). The United Nations Convention on Rights of Persons with Disabilities (UNCRPD) describe those with disabilities as having long-term physical, mental, intellectual or sensory impairments, which, in interaction with various barriers, may hinder effective participation in the community on an equal basis (UNCRPD, 2006). The World Health Organisation (WHO, 2011) estimates that roughly 10% of all children worldwide have some form of disability. They are thus a potentially vulnerable group, as these children, regardless of their disability, are often excluded in DRR research and initiatives (Boon et al., 2011, Fothergill and Peek, 2006; Peek and Stough, 2010). They are rendered largely invisible by the society and its economically fundamentalist social policies (Boon et al., 2011; Morrissey, 2012; Peek and Stough, 2011; Ronoh et al., 2015b), and they may also have difficulties obtaining access to resources in the face of a disaster. Wisner et al. (2012) broadly attribute vulnerability to poor and unstable access to resources, resulting in marginalisation in daily life and in facing natural hazards. Research tools and initiatives designed to involve children with disabilities in DRR are lacking, and are subsequently overlooked when making associated decisions and policies.

According to the United Nations International Strategy for Disaster Reduction (UNISDR, 2009), DRR refers to efforts to analyse and manage the causal factors of disasters. These include reduced exposure to hazards, lessened vulnerability of people and property, and improved preparedness for adverse events. People's perceptions of disaster risk have been known to change, and people are motivated to take action if they are involved in DRR initiatives (Wachinger et al., 2013), partly as a result of a positive shift towards realising both group and personal agency towards self-protection. People's involvement also helps in avoiding the risk of creating a sense of false security that one might get by delegating responsibility to public authorities and experts. Recent DRR initiatives have since been developed that reflect 'community inclusion' and 'inclusive practice' through education and involvement of the wider community (Mercer et al., 2008; Stubbs, 1999). Indeed, these initiatives have often been designed and geared towards involving the larger community, including potentially vulnerable groups (Mercer et al., 2008), such as children with disabilities.

3.1.1 Methodological Challenges to Involving Vulnerable Groups

While discussing research methodology, Stubbs (1999) acknowledges the complexity of issues when working with potentially vulnerable groups. These complexities include ethical and methodological considerations that may involve negotiating power relations, and the extent and level of participant involvement depending on the type of disability and consent requirements. For example, parents and caregivers have to give formal consent prior to approaching children with disabilities as potential participants. Tensions may arise and can be exacerbated either when parents refuse parental consent though the child with cognitive and other impairments is willing to participate, or when parents exert pressure on such children who may be reluctant to participate (Boggis, 2011). Further complexities of conducting research with children who have disabilities may also include the following: difficulties in articulating their experiences or perspectives through traditional methods (often interview based); difficulty in reflecting upon and in generalising from an experience; and thinking in abstract terms (Booth and Booth, 1996). As such, Booth and Booth (1996) argue against the use of traditional methods:

> *"Methods that rely on reading or writing or abstract reasoning or verbal fluency may effectively exclude them from the role of respondent or informant in ways that mirror their exclusion from wider society" (p. 252).*

Such methods instead reinforce the medical model of conceptualising disability which positions people with disabilities within a deficit and pathological frame and in need of "help" (Priestly, 1998; UNCRPD, 2006; Ronoh et al., 2015a). These methods place a focus on disability in a way that further enlarges and illuminates research dilemmas (Stubbs, 1999), prompting debates on whether or not children with disabilities are able to consent, notwithstanding associated challenges, such as instances when informed consent turns exploitative (Boggis, 2011). Consequently, their experiences and perspectives on DRR remain largely invisible in academic literature. Children with disabilities are subsequently overlooked in DRR policy and associated initiatives, and are often portrayed as "helpless" or "dependent" (Peek, 2008; Priestly, 1998) leaving them unprepared, and potentially more vulnerable to disaster risk (Fothergill and Peek, 2006).

3.1.2 Why Involve Children with Disabilities in DRR Research?

Often the geographies of children that are lived, experienced and practised by children have to find 'spaces' and 'places' alongside (and more often, within) adult geographies (Skelton, 2009). Geographers continue to grapple with the contemporary debate around notions of childhood and the material consequences these constructs have to the voices of children, and, more so, to those with disabilities; the debate also involves policy making that affects their everyday lives and environment (Prout and James, 1990; Chambers, 2012). The emerging recognition and acknowledgement that children with disabilities utilise all sorts of spaces differently to adults, despite potential risks (Thomas and Philo, 2004; Ronoh et al, 2015b), calls for alternative approaches for engaging them in research, which is a focus for this article.

This paper presents an approach to assess and interpret the experiences and perceptions of children with diverse abilities when facing natural hazards and associated risks, and to identify their actual and potential contribution to DRR. The study explores the use of flexible participatory tools to directly engage children with diverse disabilities and to facilitate their contribution to academic research. The project involves three schools representing three different New Zealand regions: Canterbury, Hawke's Bay and Auckland, which were selected based on these regions' past natural hazard experiences. The contribution of children with disabilities ultimately deepens our understanding of their experiences and perspectives, informed through children's voices, and provides policy makers and practitioners with the opportunity to design effective DRR policy and practices. A common theme and assertion throughout this article is that academics should research *with*, rather than *on* or *about*, children (Gallagher and Gallagher, 2008; Gibbs et al., 2013), as discussed in the following sub-sections.

Some researchers argue strongly that to exclude children in research, even those with profound disabilities, is unethical (Nind, 2009). Instead, DRR research with children means such studies provide more insight into their experiences, risk perceptions, and help shape future support. Such an approach appropriately aligns with key international conventions. One is the UN Convention on the Rights of the Child (UNCRC), which recognises the rights of children, and their capacity to contribute to decisions affecting their lives (Peek, 2008). The World Report on Disability (2011) and Article 7 of the UN Convention on the Rights of Persons with Disabilities (2012) also clearly identify people with disabilities as potentially vulnerable to disaster risk and emphasise the need to be provided with disability and age-appropriate assistance to participate and to realise their human rights and freedoms. Specific to schools, the Comprehensive School Safety Framework (UNESCO, 2013), among others, promotes school safety as a priority area of post-2015 frameworks for sustainable development and DRR, and provides an inclusive approach towards reducing risks for natural and other hazards in schools.

3.1.3 Conceptualising Participation in Research with Children

The adaptation of participatory activities, which include mapping and ranking activities, can access the perspectives and experiences of vulnerable groups lacking the power to make their voices heard through traditional academic discourse – the ‘excluded voices’ narrative (Nind, 2009). For example, our understanding of children’s perception is therefore expanded by involving children with disabilities in academic research (Heah et al., 2007; Nind, 2009). Hence, researchers need to explore some of these elements in relation to the children’s perception of disaster risks and in DRR. Aldridge (2006) insists,

> *“Qualitative research should not only explore tried and tested methods of investigation, but also try and test methods that may not at first seem obvious”* (p.15).

Participatory approaches have been identified as effective when undertaking research with marginalised and often overlooked groups (Mercer et al., 2008). This research used flexible participatory tools to facilitate DRR research among children with disabilities and contrasts with many traditional research studies where the project often has a pre-determined research agenda (Mercer et al., 2008).

The term ‘participation’ signifies securing both the active involvement of a wide range of stakeholders and according them decision-making power (Cahill, 2007). Various participatory models that conceptualise children’s participation have been advocated. Key among the models is that of Robert Hart (1992), adapted from Arnstein (1969), which describes in detail children’s participation by employing the metaphor of a ‘ladder’ that climbs to full participation. It follows a methodological hierarchy where best practice is situated at the top, described as ‘full participation’ (Shier, 2001; Gallagher and Gallagher, 2008). This increased traction for participatory approaches dates back to the early 1960s and the 1970s, and the ‘paradigm shift’ in the social study of childhood (Gallagher and Gallagher, 2008; Prout and James, 1990). From then, numerous publications have since emphasised the need to ‘allow’ children to participate, express their views, and, importantly, give these views weight in decision-making processes (Gallagher and Gallagher, 2008; Gibbs et al., 2013, Hart, 2008; Ronoh et al., 2015b)

More recently Mutch and Gawith (2014) provide an alternative approach to acknowledging children’s level of engagement by advocating a continuum of engagement model with children:

research for, on, with or by children. While participatory techniques have been specifically developed to ensure participants' involvement at all stages of research (Mercer et al., 2008), for 'research among children with disabilities', in particular, participants' involvement in decision making throughout the research process can be more complex. However, this paper presents flexible participatory tools to enable the engagement of children with diverse abilities in research. The tools aim to obtain their perspectives on their space and place (Goodfellow, 2012) in relation to potential disaster risk. The following section briefly highlights the limitations to children's participation, who are living with disabilities in DRR.

3.1.4 Obstacles to Participation in Research by Children with Disabilities

The DRR research and decision-making process with children with disabilities can be challenging; it takes time and slows down the process (Franklin and Sloper, 2009; Ronoh et al., 2015b), often due to limited or no use of speech or having multiple disabilities. The term 'disability' is broad and has been inconsistently defined. In addition, the poor articulation and conceptualisation of the term 'disability' play a big part in the exclusion of children with disabilities from participation in DRR initiatives (Kelman and Stough, 2015; Ronoh et al., 2015a).

In terms of disaster research, the World Health Organization's (WHO) classification of Functioning, Disability and Health (WHO, 2001) presents a relevant definition. The WHO's classification defines disability as an impairment in the body functions, structural limitation in a specific activity or a restriction in social participation. While reconceptualising disability, Stough and Kelman (2015, pp.177) emphasise that disability is "*a state in which personal ability is easily exceeded within the societal system that is unprepared to support individuals who differ.*" Despite the dearth of research among children with disabilities, Peek and Stough (2010) further provide a useful review of vulnerability factors among this group. Some examples include:

- Children with disabilities and their families often live in poverty and such families give limited attention to disability-related needs in a disaster. They often cannot afford to engage in or access recommended DRR initiatives.
- Children with mobility impairments may face challenges while practising earthquake drills, such as getting under desks, moving to higher ground during floods or tsunami warnings, and they may encounter significant difficulties during evacuation.

- Children with cognitive impairments may not recognise impending hazards or may be overly anxious in response to emergency simulations, while those with vision or hearing impairments may not receive sufficient and timely warnings or instructions.
- Children with disabilities are often excluded from DRR planning and policies. DRR professionals often assume that caregivers and parents will provide these children with the necessary information, and warn and protect them when a natural hazard occurs. Inadequate personnel and limited knowledge of disability contribute to their exclusion in DRR efforts.
- There is also a social stigma attached to having a disability, and this leads to further exclusion and discrimination, usually experienced by children with disabilities.

Consequently, the accumulation of these varied challenges lends credence to the argument not to expect children with disabilities to understand complex decision-making processes in DRR research, a concern that raises important issues to consider. The challenges to their participation, therefore, calls for an approach that requires adults and children to develop new skills and involves an investment of resources. It often entails a major shift in attitude within organisations and in power relations where children are usually viewed as incompetent and in need of protection (Franklin and Sloper, 2009), instead of providing them with access to resources.

At the same time, most lived experiences, as well as risk perceptions for children with disabilities, are acquired in a family or school context, which are important environmental factors. Conversely, the child inevitably influences the participation of others in a family or school environment (McConachie and Diggle, 2007). That is why McConachie and Diggle (2007) highlight the difficulty of placing a clear boundary around children with disabilities when describing their participation, and participatory tools should encompass the reality that, in some instances, the child participates as part of the family or school rather than as an individual.

However, the complex and bureaucratic nature of school procedures and processes, or family's interest in its autonomy and privacy, may hinder the participation of the child with a disability. This may happen while they are being protected from disaster risks or being denied an opportunity to participate in DRR initiatives (Park et al., 2001). The next section describes the context and the methodological approach that was employed to directly engage ‘disabled’ children and therefore it addresses some of the disabling barriers found in traditional research (Boggis, 2011).

3.2 Study Design, Context and Access to Participants

3.2.1 Research Context

This project used a multi-case study approach (Yin, 2014), where three schools from different regions in New Zealand formed a basis to understand DRR with children with disabilities. The suitability and strength of a case study rests in its power of attention to the local situation and it is central when research is meant to address descriptive questions (e.g. what is happening) or explanatory questions (how and why something is happening) (Yin, 2014). This approach aligns with the aims of the current study in two ways. First, it assesses and interprets the experiences and perceptions of children with disabilities when facing natural hazards. Secondly, it identifies their actual and potential contribution to DRR. The approach has its basis in a constructivist paradigm that truth is relative and dependent on one’s perspective. The researcher’s intent is to make sense of (or interpret) meanings others have about the world (Creswell, 2013; Thomson and Philo, 2004) through ‘child centred’ participatory tools. The study areas and schools were selected to reflect differing geographical locations in New Zealand (Figure 3.1) and experiences of past natural hazards and disasters.

The study in Christchurch took place more than three years after the Canterbury earthquakes of 2010 and 2011. The September 2010 earthquake (magnitude 7.1) caused massive damage to buildings and infrastructure, as well as liquefaction and flooding in Christchurch. The February 2011 earthquake (Magnitude 6.3) devastated the city and left 185 people dead (Gibbs et al., 2013).

In the Hawke’s Bay region, the February 1931 earthquake (magnitude 7.8) rocked and damaged housing, buildings and infrastructure in Hawke’s Bay, followed by rapid fires in the city of Napier. It resulted in several landslips, and 4000 hectares of the seabed rose, causing the deaths of 256 people across the whole region (Dowrick, 1998; Hill and Gaillard, 2013). In Auckland, although volcanic eruptions (Newham et al., 1999), tropical cyclones, floods and tsunamis are Auckland’s potential natural hazards, the region has not experienced a major disaster event in the recent past.

Figure 3.1: Map of New Zealand-case study areas.
Source: Created using ArcGIS

3.2.2 Gaining Access to Children with Disabilities as Participants

There are often unique and difficult challenges when accessing children with disabilities for research. Where research involves potentially vulnerable groups, having a visible and respected individual who holds a position of authority, high respect or leadership plays a crucial role in helping to introduce researchers to such a group (Liamputting, 2007). For most of the schools approached, a district hospital health researcher and paediatric consultant, who works with schools and children with disabilities, was instrumental in introducing and linking the researchers to respective school principals. The first author initiated communication with schools by a phone call or email, and then later scheduled a meeting to present a research goal to firm up the research design with school principals and specialist teachers. A total of eight schools from the three regions expressed initial interest, although a degree of persistence was often required. Despite access challenges experienced by the researchers, three schools (one per region) consented to take part and were able to participate in the study. A common challenge was where some schools were unwilling to initiate any engagement or discussion until ethical approval for the research had been obtained.

Initially, however, to seek access to participants, build rapport and establish trust with staff and students, the first author undertook two prior school visits to each participating school. The visits also aided in agreeing to and firming up the research design. This is a strategy vital for focus groups, interviews and observation of children with disabilities (Nind, 2009; Boggis, 2011). The prior visits were also critical for finalising the research design where the research goals, associated methods and workshop outline (Table 3.1) were agreed upon by the school principals, teachers and boards prior to obtaining research ethical approval. This meant that, as opposed to a participatory approach (Mercer et al., 2008), the definition of research goals, associated methods and tools were arrived at by the researchers in consultation with specialist teachers, relegating children to research participants. However, the study still incorporated flexible and inclusive participatory tools to empower children by giving them a voice and greater participation in DRR research and thus developing a sense of co-ownership of the outcome as presented in the following section. The school principals, through regular parent-teacher meetings, approached and explained the research aim and highlighted the research activities to the parents. The principals also provided them with a Participant Information Sheet (PIS). In particular, parents and caregivers for the participating children were invited for semi-structured interviews. Specialist teachers, and one official each from Civil Defence Emergency Management (CDEM), District Health Boards and New Zealand Red Cross were also invited.

The three schools allowed the researcher access to special class units for children who have diverse disabilities (Table 3.1) producing a heterogeneous group of participants. Therefore, these workshop participants (comprising a class of 8-10 children), who were aged between 10-16 years, required some level of adult support as indicated by the high numbers of adult teacher-to-child ratios of between 1:2 and 1:4. In the Auckland school, for two of these children, English is their second language.

Table 3.1: Focus group/workshop participants

Case study (School)	*Class size/ Number of participants*	*Disabilities disclosed by each school*	*Associated challenges*
Christchurch	10	Autistic spectrum disorders; learning, visual, mobility difficulties and other degenerative conditions	Difficulties with comprehension, memory, communication, hearing, vision, relating to others, mobility difficulties, anxiety at changes in routines and obsessive-compulsive tendencies.
Hawke's Bay	8	Autistic spectrum disorders; learning, hearing, and mobility difficulties, and fragile X syndrome	
Auckland	9	Autistic spectrum disorders; learning, mobility difficulties and other degenerative conditions	

Source: Case study schools

Often, there exists an assumption from parents and teachers that they were responsible for passing DRR information on to children with disabilities and/or act to protect their safety (Peek, 2008). For example, while parents and teachers in this study agreed on the significance and potential benefits of children participating, they still questioned how this could be achieved meaningfully. The adults questioned the capability of some children with diverse disabilities (Table 3.1) when tasked with the challenge of assessing abstract concepts related to disaster risks and making decisions within limited timeframes. This practice assumes that parents make responsible and appropriate decisions and choices about risks their children face. This view, whilst well-intentioned, masks the individual and group value/capacity of the child as an agent able to assimilate and manage information and to convey rational risk management choices among their families, friends and wider networks (Peek, 2008). It is this view the research aims to challenge through the use of participatory tools and resonant ways to affirm inclusivity and the presence of participants' voices.

Data Collection and the Workshop process

The study was conducted over a period 20 months: July 2014 to May 2016. Data collection methods included a four-day workshop in each school with children with diverse disabilities. The workshops were carried out during the morning hours over four consecutive days in each of the three schools (Table 3.2). Overall, the workshops took two hours (comprising 20-minute sessions). The research design and activities enabled the engagement of children with the disabilities through participatory tools, allowing participation along children's spectrum of abilities (Nind, 2009). In addition, voice recordings (discussions and semi-structured interviews), photographs (maps), and observation/field notes were made. Semi-structured interviews involved a total of 21 participants: two teachers, two parents and one official each from the New Zealand Red Cross, District Health Board and the local CDEM in each region. The interviews took between thirty minutes and one hour. The aim was to obtain participants' experiences and views about the schools' role in disability-inclusive DRR. The workshop activities and semi-structured interviews were recorded and transcribed for data coding. Observations were also made during the disaster drill of "drop, cover or hold", for earthquakes and evacuation of tsunami (Johnson et al., 2014) to assess the children's role and its appropriateness.

However, this article focuses on three research activities (Table 3.2) to facilitate and explore participants' experience and risk perception in their school environment. It entailed the use of proportional piling to support ranking of natural hazards, and mapping exercises to assess and identify disaster risks related to safe and unsafe school spaces. The third involved developing a survival kit activity that enabled participants with diverse abilities to categorise emergency items into 'very important' and 'less important' categories during a disaster.

Table 3.2: Outline of workshop activities

Day	*Activities to be undertaken by the researchers with teacher presence and support*	*Resources*
1	• Planning session and focus group preparation by researcher and specialist teachers • Introductions and background to the study and workshop aims • Discussions around natural hazards with video clips to obtain children’s views and understandings of different types of natural hazards. • Proportional piling of natural hazards • Class mapping using canvas and identification of safe and unsafe spaces should a natural hazard occur.	PowerPoint projector Floor space for activities Large Canvas x2 Sponges/cut foam Fruit sweets Cellotape/ glue Colouring paint Push pins, marker pen Scissors Foam board A4 paper
2	• Mapping the school to cover most parts of the school on a large canvas. • Identification of spaces and buildings using paint and sponge or foam • Discussion and identification of safe and unsafe areas in case of an earthquake or tsunami • Identification of vulnerabilities and capacities within the class/ school - who would be more vulnerable, who would help others? • Follow up discussions on a class disaster plan in place. What changes are needed?	
3	• Group discussion around emergency kit items - why, and when they are needed (pictures provided for prompts)? • Categorise the items into ‘very important’ and ‘important ‘items on separate sections of A3 paper. • Feedback on focus group activities/debrief.	Printouts of emergency kit items (in A4) A3 paper Scissors Glue sticks
4	• Observation of school safety drills/disaster simulation drills • Semi-structured interviews (2 students, 2 teachers, and 2 caregivers, and representatives of relevant stakeholders.	

The research team consisted of two senior researchers with experience in both working with potentially vulnerable groups and using participatory tools, who provided guidance throughout the research process. Gibbs et al. (2013) stress the importance of considering the credibility and capacity of the researcher when researching children in disaster contexts. They advise the central involvement of a senior researcher to ensure the presence of skills, flexibility and authority to adjust the approach in response to emergent issues. The first author, together with the specialist teachers, who all had vast experience working with children in schools, became workshop facilitators. Using the guide outline of research activities (Table 3.2), the facilitators in all three schools helped provide clear, simplified, but sufficient information including pictorials (Nind, 2009), to give assent for children to participate. The specialist teachers, in particular, were essential in clarifying some of the unclear verbal and non-verbal responses. The facilitators took time to ensure a shared understanding of objectives and the process of participation, including a clear description of the approaches and their role in it. The research activities described in the next section were also conducted on the floor to limit eye contact, attenuate power relations and avoid the risk of participants feeling pressured to take part.

For this study, data analysis included the workshop data set, participant observation memos, semi-structured interview transcripts, workshop photographs, school safety and policy documents and field notes coded in Nvivo software. The rationale for using multiple methods to obtain data is to triangulate evidence, increase reliability and serve to corroborate the data gathered from other sources (Baxter and Jack, 2008; Creswell, 2013). The first author initially categorised data and identified patterns and potential themes, as guided by the six steps of thematic data analysis (Braun and Clark, 2006). For the cross-case analysis, the first author coded each data source from each school. The coded data were then analysed independently by the researchers to establish patterns and/or concepts that made initial themes. These were compared and contrasted vertically (within each case) and then horizontally (cross-case analysis) (Yin, 2014) to arrive at key research themes (Ronoh et al., 2015b, Ronoh, 2017). The study findings were analysed in relation to the available literature on children, disabilities, and disaster.

3.3 Exploring Flexible Tools among Children with Disabilities

This paper, and this section specifically, discusses three participatory tools used in each of the three schools. The tools were used to engage, assess and interpret the experience and perception of children with diverse abilities when facing natural hazards and disaster risks, as outlined in Table 3.2 above.

3.3.1 Proportional Piling Technique

The proportional piling technique involves participants identifying, discussing and making a list of potential natural hazards around their region. The list of hazards identified is then transferred onto coloured A4 paper by participants and placed on the floor (Figure 3.2). In the Auckland school, for example, the facilitators gave each participant three red, two orange, and one each of purple and green fruit-flavoured sweets to distribute among five potential hazards based on colour with an agreed order: 1st (reds for most dangerous) to 5th (least dangerous) respectively, based on their individual perception of associated disaster risk. The different colours helped/assisted in guiding the sequence of distribution among the children. As a starting point, the technique was crucial in sustaining the much-required interest to explore participants' awareness and understanding of natural hazards within their region. It was evident from observation and focus group discussions that the proportional piling activity was simple and easy for participants with learning disabilities or those with literacy challenges to make their views and perceptions known regarding potential hazards and associated disaster risks. For example, participants linked the risk of 'drowning' to 'flooding', 'hot lava' to 'volcano' and 'violent wind' to 'tornado'. The activity remained voluntary to the end when one participant volunteered to do the final tally and obtain the total for each hazard for ranking (Figure 3.2).

The activities were conducted on the floor to limit eye contact and attenuate power relations. It was less confrontational, required less oral discussions and thus accommodated those children with limited verbal and literacy skills who often have difficulties in expressing their views. Significantly, the tool enabled a positive display of participant's active role with limited instances of adult support in problem identification (disaster risk), risk analysis and in suggesting associated protective actions. For example, one very instrumental student, Frank (not his real name), in the Christchurch school, was described by his teacher as 'very visual':

> *Yes, Frank is a visual learner and has very strong eyesight that often compensates his hearing challenge. He has a speech impairment, and mainly relies on vision. He is low functioning, but his awareness of things and safety around the surroundings is quite strong.* (Teacher, Christchurch)

Teachers guided the order in which students took turns to place coloured sweets on their perceived potential hazard selection and thus helped avoid instances of participant bias or in dissuading those who had a tendency to ‘copy’ choices from others.

However, the inclusive nature of the activity was challenged when one student participant in the Hawke’s Bay school opted out, and walked away abruptly while other participants were watching a short video clip with associated audio on floods in Hawke’s Bay. The teachers explained that the student was very sensitive to the noisy environment created by the video clip. The importance of having alternative activities, prepared by the researchers in conjunction with the specialist teachers was apparent when a teacher redirected him to another activity. He later re-joined a group session for categorising potential survival kit items into important and less important items and other workshop activities. He actively participated and also admitted that “*I like cutting, pasting and colouring*”. This signified the flexibility of the tools to accommodate children with diverse disabilities and interests.

Figure 3.2: Participant counting fruit sweet allocations and ranking of natural hazards by proportional piling
Source: Auckland FG 2014

Importantly, the tool brought forth children’s knowledge of natural hazards in their respective region and associated protective measures. The child participants commented that they enjoyed the activity, and often requested unplanned or additional sessions with the researchers. It was clear from observation that they showed sustained interest, and, during semi-structured-interviews, caregivers reported increased DRR discussions and activities from the child participants at home.

3.3.2 Mapping Activities

The child participants, with support from the facilitators, carried out two mapping activities during the workshop in each of the schools. One map represents their class (Figure 3.3) and identifies safe and unsafe spaces should a natural hazard occur. Notably, when the drawing was completed for the class map, participants proceeded with excitement to cut sponges/foams to size to represent their desk, then coloured them using different colours, and, with a coloured push pin, positioned them at their seating location. A green push pin signified a safe space while red meant a location perceived as unsafe. Most participants easily located their seating positions from the class map while two had to be guided by the facilitators. From observation of the foam cuttings, the size variations in estimating the sizes of desks were diverse (Figure 3.3), illustrating the inclusiveness of the activity which reflects individual perspectives of their class space.

Figure 3.3: Classroom map of safe and unsafe spaces during an earthquake
Source: Auckland FG 2014

The second and third maps (Figures 3.4 and 3.5) cover the whole school. In each school, one workshop volunteer initially did a sketch before drawing the whole school map outline on a large canvas. The participants then identified, discussed, and agreed on significant spaces, school locations and buildings on the map to be gone over with marker pen, push pin or colouring and stickers (Figure 3.4). The Auckland and Hawke's Bay schools used sponge/foam or pins on specific buildings based on their perception. The flexibility of the map format was evident when the Christchurch school opted to draw and paint sections of the school and rooms (Figure 3.4), while the other two schools modelled a 3D format of their respective schools (Figure 3.5). Still, the two options made the otherwise abstract concepts of hazards, risk and safe spaces more meaningful and tangible for the children (Gaillard and Maceda, 2009).

Figure 3.4: Christchurch school map of safe and unsafe locations
Source: Christchurch FG 2014

The students cut the foams/sponge and a different colour or paint was used to represent specific buildings (e.g. for gym, kitchen, classes, water tank). The mapping activity (Figure 3.4) became useful when investigating what children perceived to be either safe or unsafe locations within the school should a natural hazard (e.g. earthquake) occur. Overall, most of the workshop participants actively engaged in the activities that offered both visual and kinaesthetic spatial experience.

The mapping tool provided inclusive opportunities to involve children with diverse disabilities in speech, cognition, and literacy levels. Some students made a choice of their preferred contribution in the mapping activity: drawing map outline, cutting sponges, colouring or gluing to produce an interesting form of an agreed ‘division of labour’ (Figure 3.5), which was a display of collaborative effort and group action. Others stood out to take leadership and co-ordination roles exposing some existing power relations within the students too that required cautious facilitation. Overall, this inclusivity resulted in a more accurate analysis of their risk perceptions and voices regarding safe and unsafe spaces. Children identified classes with tables to go under, and rooms or offices with adults (teachers and managers) that were perceived as safe from disaster risk (earthquake). Safe places were labelled with either green colouring, push pin or a green sticker, while red or maroon symbolised unsafe locations. Surprisingly, places of play and those like ‘sensory/relaxation rooms’ and a paint store (for one student) were all associated with enjoyable experiences, and were also perceived and labelled as safe spaces.

Figure 3.5: Participants working on a map/3D model of safe and unsafe locations
Source: Auckland FG 2014

The workshop participants, with the aid of the map, identified and discussed the structure and quality of their class building. They described that other hazards and associated risks, including their glass windows and class roofs, projector and large glass windows would fall if an earthquake occurred. These were perceived and appropriately labelled as unsafe spaces.

3.3.3 Survival Kit Activity

The survival kit activity took advantage of a class ‘children centred’ practice of cut and paste. Participants were provided with pictures in an A3 print-out of survival kit items vital when a disaster strikes. Working individually or with teacher support, the children had to cut out each item and carefully assess its significance, by considering ‘why’ it may be needed and ‘how’ it may be useful during a disaster. The items were categorised into ‘important’ and ‘less important’ only, providing an alternative activity that offers a basic level of engagement particularly for children with learning disabilities. The final step was transferring the cut items or associated pictures and pasting them onto the relevant ‘important’ or ‘less important’ section of another A3 paper (Figure 3.6). Again, the pictures helped in stimulating memory and discussion (Box 3.1) on why some items, for example, water and a torch or lighting, were very important during an earthquake.

Box 3.1: Hawke’s Bay school memo

17August 2014: Hawke’s Bay research memo: (Day 3 Session 1)

Session 3 began with an ‘energizer’, and then a recap of vulnerabilities and capacities within the school from the class and school mapping activity, and immediately moved to group discussions around items of an emergency kit. What? Why, and When do we need it? The specialist teacher provided pictures for prompts. After ensuring that the participants understood what the task entailed, each student was given an A4 printout of emergency kit items in A4 and A3 to categorise the items into ‘Very Important’ and ‘Important ‘items on separate sides.

Note:

From observation, the participants appeared eager to get started with their ‘cut and paste’ activity. In a few instances, the facilitators’ offers for support in the activity was turned down and most students worked confidently on their own. This scenario reflects what was observed in the Auckland school, and again there was a slight contrast to the mapping activity, where facilitators continually provided support, guides or prompts.

Pictures also helped in finding alignment with body language and verbal communication. When one facilitator asked John (student - not real name) why he placed medication on the ‘important’ category, he answered while firmly pointing his finger at the medication cutting that he has often been put on medication.

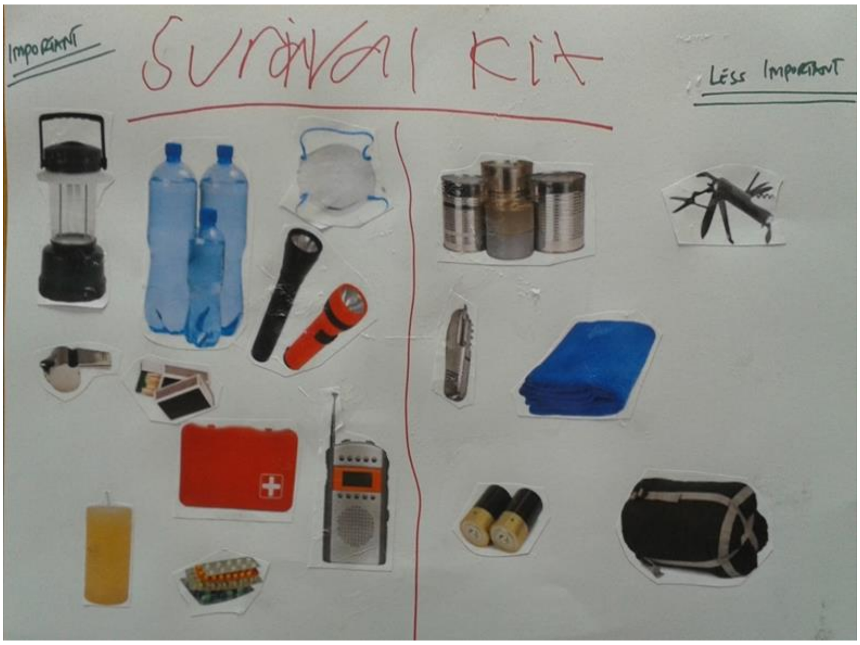

Figure 3.6: Survival Kit activity
Source: Hawke’s Bay FG 2014

It was noticeable in all three cases that the participants appeared at ease and confident while actively working on this task. Teachers supported this view, attributing the ease and interest in this particular ‘cut and paste’ activity partially to familiarity with the exercise as ‘child-centred’ and to its simplified level of categorisation of items (Figures 3.6). Another possible reason may be the timing of this activity, being on the third day of the workshop. The first and second day of the workshop may have helped develop a sense of trust between the children with disabilities and facilitators. It was observable that participants continued to gain confidence that their choices and voice were being valued, and in realising personal agency toward self-protection. Enhanced confidence and trust confirms the important role of the research process in providing more participation and inclusive opportunities to strengthen capacity building, and developing a sense of co-ownership of the research outcome.

3.4 According Participants a Voice and Developing a Sense of Ownership of the Research Outcome

The three research activities – proportional piling, mapping and the survival kit activity – gave children with diverse disabilities decision-making opportunities in the research process. Their contributions, irrespective of their disabilities, included the identification of potential natural hazards and associated risks, assessment and expression of perceptions, and suggesting protective actions. For example, some children with speech and/or literacy difficulties, with teacher support took part in the research process in an inclusive way; they were not solely reliant on verbal or written responses common in other qualitative methods, surveys or questionnaire-based research. These approaches, therefore, helped provide a rigorous insight into the lived experiences of children with disabilities.

The workshop activities became catalysts for engagement, along with other associated benefits. They afforded the participants inclusive opportunities to present their skills and experiences during the research process through either verbal or non-verbal communication. Specifically, the map offered students an opportunity to realise their potential group capacity in DRR research. For example, in Hawke’s Bay, one teacher stated that the mapping activity not only promoted dialogue among students, but between the student and adult participants. In the process, the children gained increased confidence when they felt they were being given a chance to participate and that their contribution was being valued. With time, this later developed into a safe environment where all participants were able to work confidently as was realised by the third day of the workshops. The finale was the research outcome and follow-up presentations to parents, and other workshops by the children to help raise natural hazard awareness.

Other researchers agree on the central value of participation in research among children with disabilities. In their research on successful participation and the experience of children with disabilities, Heah et al. (2007) concluded that, overall, increased participation in children’s activities often results in a number of positive physical, psychological and social outcomes. The participatory methods enable participants to engage with research processes that are safer and more resonant as well as producing representations of their own social worlds (Cahill, 2007; Woodhead, 1999). The process encourages sharing of decisions which affect one’s life, (Cornwall, 2011; Hart, 1992) and spaces which they inhabit (Goodfellow, 2012). Ultimately, in this study, the tools empowered the children by granting them access to participatory resources and sharing their own knowledge and understanding about disaster risks with adults. They also helped lessen the problem of the power relation (Mercer et al., 2008) between adults and children with disabilities.

The innovative and inclusive nature of the workshop activities was a result of partnership with schools and specialist teachers within, in supporting and facilitating the children to form a significant part of an authentic research analysis. They established friendships and knowledge of each of their peers' situations and often these participants supported or validated each other's points of view. The map activity, for example, helped highlight children's knowledge of hazards and risks, enabled knowledge sharing and transfer, and underscored the valuable resource strength of group action among participants. The flexibility of the tools allowed facilitators to ensure fairness and that the children participating took turns in contributing. This enabled, then 'collectivised', their perspectives and experiences. Also with the teachers' support, the children developed and exhibited some level of confidence. They would often approach the researchers during break times, asking to have an unscheduled session. This enthusiasm was still evident months later when the workshop participants took photographs: they had beaming and smiling faces as they stood behind their updated maps; and they sent messages to the researcher asking that their photographs be added to the research report. This was further evidence that children with disabilities, like many other research participants, were keen to participate in and own their stories.

The Hawke's Bay School workshop participants also took ownership of and proudly presented their 'mapping' of the school's safe and unsafe spaces to a parents' meeting. They later participated in representing their school in a 'disaster' workshop for children with disabilities organised by the local Hawke's Bay MCDEM. The disaster workshop was also attended by persons with disabilities who had experienced the February 2011 Christchurch earthquake. Workshop facilitators reported how knowledgeable and confident the students were. These workshop opportunities acted as a mode of taking ownership and sharing their knowledge. As a result, it highlighted the potential capacity of children with disabilities to be involved in DRR initiatives through flexible participatory tools.

3.5 Scaling Participation along a Continuum of Engagement among Child Participants

Conventional research approaches (e.g. surveys, questionnaires and interviews, focus groups, and participant observation) may have more credibility, but they are less effective when used with vulnerable groups such as those with disabilities (Heah et al., 2007). This partly explains the total exclusion of people with disabilities from participating in the research process. By contrast, while this research recognises obstacles faced in the research process, it provides a platform where flexible and participatory tools accommodate and offer children with diverse disabilities opportunities to learn and communicate their perceptions on disaster risks. The challenges notwithstanding, with the appropriate participatory tools, even children with profound disabilities were able, with support, to express some kind of preference (e.g. between two items). Most participants were able to contribute their views, and with teacher support shared their experiences and their perceptions of risks. This was possible without a requirement for them to change how they express themselves (Willow, 1997) by observation and adapting new approaches (e.g. the simple participatory tools outlined next).

First, the participatory tools helped children with cognitive and learning difficulties. These children are often viewed as slow and incompetent in expressing their views and in contributing to the research (King et al. 2003). However, their engagement became possible with minimal teacher support and by increasing their decision-making capacity through simplified tasks or by using pictures as a catalyst to stimulate memory (Nind, 2009), as in the case of the survival kit items. For some children, selecting between two options and placing items on the important and less important categories (Figure 3.6) was the only level at which they were able to participate. For others, to weigh more options such as ranking of hazards and mapping safe and unsafe places (Figures 3.4 and 3.5) required more guidance and support from facilitators. The implication is that inclusive opportunities that require varied levels of engagement are vital in developing the children's capacity to participate and make choices and/or decisions, and, crucially, to inform DRR. It means recognising that children with diverse disabilities, for example, communicate and participate through means other than speech. The goal is to assist children to understand disaster risks while providing them with problem-solving capacity, through targeted activities/tools, teacher support and scaled entry-points for children with diverse abilities. What remains in dispute and requires further research is getting the balance right in terms of child protection and their level of participation in DRR (Mitchell et al. 2008; Ronan et al. 2015b; Ronoh 2017).

Second, it is true, though, that few children spontaneously offered to participate and others often required prompting despite all having the right to participate. Some children were inarticulate either because of low self-esteem or anxiety, while others remained largely unresponsive except for basic choices between one or two items provided by the survival kit activity. Consequently, these children were often unable to easily express themselves and their emotions in written or spoken words but were still able to participate in ranking natural hazards and identifying perceived risks, safe and unsafe spaces. They made their views and perceptions known by using non-verbal methods of engagement options provided by the tools. Careful observation was also directed at what was unsaid (Booth and Booth 1996), including paying attention to facial expressions, pointing and nodding or body language. Booth and Booth (1996) stress that a bridge to achieving successful participation entails developing research tools which can maximise children’s communication potential as a two-way process that requires adults to learn and understand how the child expresses her/himself (Nind, 2009). It became evident that, where children have profound disabilities, common traditional research methods like questionnaires and interviews are inappropriate due to their low levels of literacy and lack of the ‘required’ communication and social skills.

The third challenge among most workshop participants, and particularly those children with visual impairments, was the difficulty in generalising the map and other abstract concepts like risk, hazards, capacity and vulnerability, including safe and unsafe spaces. However, the proportional piling activity and the tactile map of their school provided a combined visual and kinaesthetic spatial experience. This approach rendered the concepts more tangible or concrete especially for those children with sensory impairments. The proportional piling and mapping activities specifically highlighted the visual capacity of participants who had difficulties expressing their views rather than their verbal capacity, by adapting participatory tools. Other researchers have emphasised that children’s knowledge of space and surroundings can be obtained from different multi-dimensional or sensory modalities (Andreou and McCall, 2010; Nind, 2009). Such an approach allowed exploring both the multiplicity and complexity of DRR research with children of diverse abilities. Notably, workshop activities were conducted on the floor to help attenuate power relations, allowing the children and adults (facilitators and student support) to work together in collaboration. They each had their own skills, experiences and interests and thus participation was along a continuum (Mutch and Gawith, 2013) based on the type of workshop activity and the participants’ diverse abilities (Franklin and Sloper, 2009).

This research highlights the heterogeneity and complexity of participation among children with diverse disabilities and shows that effective use of flexible techniques can bridge the participation gap, enabling a two-way communication between adults and children. In conceptualising disability and perceived non-competence, research by King et al. (2003) categorised three factors that influence participation: environmental, family and child factors (which also includes having a disability). Strikingly, they show that disability status only represents a minor impact on participation, compared to the strong influence of environmental factors (Willow, 1997). That is why in this study the participatory tools helped facilitate children's contribution, gaining increased confidence through the provision of appropriate disability support; they felt their contribution was being valued and they were being given a voice and an opportunity to participate.

The participatory activities helped highlight children's knowledge of natural hazards. Significantly, the activities demonstrated that children's experience of the world such as of safe and unsafe spaces is different from adults'. The child's perceived 'potential functions' of different 'spaces' (Thompson and Philo, 2001) now require questions to be asked. Such questions would include whether current DRR strategies reflect only adult expectations regarding safe and unsafe spaces. Do they have regard to the children's viewpoints, and do they affect their potential contribution to DRR? The research reinforces the need in the short term for the removal of barriers that hinder children's active involvement in DRR. In the long term, it shows we must systematically take account of disability needs across all aspects of DRR.

3.6 Concluding Comments

This paper highlights the need to consider a broader understanding of the meaning of the term 'participation' for children with disabilities that takes into consideration children with diverse abilities. They are often excluded in DRR initiatives and are subsequently overlooked in DRR policy and practice. Franklin and Sloper (2009) blame this lack of children's involvement on the absence of effective research tools/aids. Those with profound disabilities or cognitive and intellectual disabilities are often cited as unable to be in control at every or any stage of the research process. However, when it comes to indoor and outdoor spaces, children have different experiences, usage and perceptions (Skelton, 2009). Their experiences and perspectives have largely been explored through voices and perceptions of adult proxies. Thus, this paper argues for focus to be placed on flexible tools to bridge the participatory gap and maximise children's involvement and communication potential, which is a real opportunity for greater understanding and participation in DRR with children with disabilities.

The paper recommends incorporating a shift in attitude to children with disabilities as active participants (Chambers, 2012), in DRR. The approach should be in line with The Sendai Framework for Disaster Risk Reduction 2015-2030, which is particularly strong on the need to include individuals with disabilities in the DRR agenda (Stough and Kang, 2015), and the Comprehensive School Safety Framework (UNESCO, 2013), which requires building the capacity of children with diverse disabilities in DRR planning and initiatives. It also implies that the use of participatory approaches/tools become the environmental fabric of engagement among children with diverse disabilities in DRR initiatives. Emphasis needs to be placed on resources that facilitate and strengthen two-way communication between adults and children, and embedded as an integral part of the adult-child relationship. The ultimate aim is to encourage sustained participation along children's spectrum of abilities through participatory tools that empower them: engage, give voice to support children with disabilities' and enhance DRR, which reflects their needs.

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Chapter 4. Children with disabilities and disaster preparedness: A case study of Christchurch

Ronoh S., Gaillard J.C., and Marlowe, J. (2015). Children with Disabilities and Disaster Preparedness: A Case Study of Christchurch. Kōtuitui: New Zealand Journal of Social Sciences. 10(2): 91-102. doi:10.1080/1177083X.2015.1068185.

An estimated seven million children with disabilities worldwide are affected by disasters annually. This significant figure emphasises the particular vulnerability of these children in facing natural hazards. However, their needs as well as their capacity and role in DRR have largely been overlooked by researchers and policy makers. This paper draws upon a case study in Christchurch to identify insights, realities, possibilities and obstacles in relation to the involvement of children with diverse disabilities in disaster preparedness. It reports on findings from focus group discussions and semi-structured interviews with children who have disabilities, their teachers and caregivers to explore children's preparedness and potential responses to a disaster. The findings indicate a considerable variation in on how children with disabilities access available resources and perceive, face and cope with natural hazards. This paper shows their potential contribution to disaster preparedness and provides further suggestions for policy and practice.

4.1 Introduction

Every year millions of children worldwide are affected by disasters in many forms (UNICEF, 2007; Masten and Osofsky, 2010). Of these, more than 7 million are children with disabilities, while millions more acquire disabilities during childhood as a result of disaster (Peek and Stough, 2010). Subsequently, the literature on disaster has identified children as a vulnerable group (Anderson, 2005; Peek and Stough, 2010; Wisner, 2006; UNIDSR, 2006; MCDEM, 2009; Ronoh et al., 2015), but their diverse needs, experiences, perspectives and potential roles in DRR have been largely overlooked or ignored by researchers and policy-makers. Anderson (2005) argues that the perspectives of children and their capacities to inform decision-making processes, to take direct action, and to reduce risk have been neglected due to their status and skewed power relations between children and adults in the society.

In Christchurch, the 4 September 2010 and 22 February 2011 earthquakes, and numerous aftershocks, disrupted routines, and caused considerable stress and heightened anxiety among children with disabilities in the region (Mitchell, 2014). This paper reports a case study from Christchurch on the experience of children with disabilities in facing the earthquakes that devastated much of the city. It explores their knowledge and understanding of natural hazards in a school setting, assesses their preparedness to face disaster and their capacities to cope in the aftermath. The paper concludes by suggesting potential strategies for promoting DRR and preparedness among children with disabilities. The research adds to the 'children's potential capacity' narrative (Haynes and Tanner, 2015) and begins by providing an overview of relevant literature in the area of disability and disaster.

4.2 Children with disabilities, preparedness and DRR: a conceptual background

Many researchers have often raised concerns about the risks that children face during disaster (Anderson, 2005; Peek, 2008; Peek and Stough, 2010; Alexander et al., 2012). Often, they are portrayed as passive 'victims' in the face of disaster, leading to a 'children at risk' discourse (Gibbs et al., 2013). Admittedly, a growing body of empirical research and practices that counters the 'helplessness' narrative is emerging, and emphasises children's capacities to contribute in preparedness and other DRR initiatives (Anderson, 2005; Peek, 2008; Haynes and Tanner, 2015). For children with disabilities, vulnerability during disaster is exacerbated by their young age intersecting with disability and other factors such as geographical location and family structure. The following paragraphs connect the concepts of disaster, disability and preparedness.

According to Wisner et al. (2012), a disaster situation refers to a natural hazard which has consequences in terms of damage, livelihood/economic disruption and/or casualties that are often too great for the affected area and people to deal with properly on their own. On the other hand, disaster preparedness is "the knowledge developed by governments, organisations, communities and individuals to effectively anticipate, respond to and recover from the impacts of likely, imminent or current hazards" (UNISDR, 2009, p. 21). Hence, disaster preparedness is an important education and awareness strategy to convey information about hazards to the general public. Specifically, for children, it means the child's knowledge of protective behaviours increases the capacity to cope when left alone or unsupervised, and potentially enhances a family's collective capacity if the child can act independently, and/or may help others who are unaware of correct actions (Finnis et al., 2004).

However, there is lack of clarity and understanding of the term 'disability', and thus it is inconsistently articulated (Kailes and Enders, 2007; Watson et al., 2012). This partly explains the exclusion and marginalization of children with disabilities from DRR activities (Smith et al., 2012; Ronoh et al., 2015). Subsequently, most disaster policy and planning documents identify people with disabilities as members of 'vulnerable' or 'special needs' populations despite the existing heterogeneity of people with disabilities (Kailes and Enders, 2007; Priestly and Hemmingway, 2007). For example, the medical model view of disability as a medical problem ignores structural and cultural barriers that hinder the inclusion of children with disabilities in daily activities. By contrast, the social-model proponents argue that disability is centrally structured by social oppression, inequality and exclusion (Thomas, 2004) and it should be tackled alongside other social discriminatory practices (Watson et al., 2012), by the inclusion, participation and involvement of people with disabilities in community activities (Crow, 1996), including disaster preparedness.

As such, disaster researchers and practitioners identify children and persons with disabilities, along with other groups, as especially vulnerable to the harmful effects of disaster (Wisner et al., 2012) due to lack of or limited access to vital day to day resources (Gaillard and Maceda, 2009). Subsequently, they are marginalised when facing natural hazards. However, Peek (2010) points out that not all children are equally vulnerable to the impact of disaster. Instead, the age of the child intersects with other personal and social characteristics. For this research, those features include an existing disability, from which an attempt is made to determine the likelihood of harm in a particular disaster event. However, Haque and Etkin (2007) acknowledge that individuals and communities have developed intrinsic abilities to learn, to cope with and to apply different skill sets and sources of knowledge in the face of disaster.

Importantly, Cadag and Gaillard (2014) define capacity as a set of knowledge, skills and resources that people resort to when dealing with natural hazards and disaster. It encompasses the ability to either use or access the resources needed and goes beyond their sole availability (Wisner et al., 2012). For children with disabilities, researchers need to understand how they access and use resources, the perception, skills and strategies they adopt in facing a disaster, and to identify when and how to provide support (Smith et al., 2012). Examples include agreeing on warning signals for potential hazards, associated protective actions, planning evacuation routes and meeting points, identifying vehicles and shelters, and preparing an emergency kit and other resources to cope with the disruption of daily life following a disaster (Wisner et al., 2012).

Although there are existing curricular related impediments in schools (Mitchell, 2009; Johnson et al., 2014), disaster preparedness programmes are beneficial if the child understands potential natural hazards and associated safety strategies to apply in the face of disaster (Ronan and Johnston, 2005). Preparedness within the home and school environment, such as having survival kit supplies in place, improves the likelihood that a child will be able to face and cope with a disaster (Ronan and Johnston, 2005). In New Zealand, the Ministry of Civil Defence and Emergency Management (MCDEM) provides preparedness educational resources entitled What’s the Plan Stan?, consisting of a CD and online DRR resources (Johnson et al., 2014). Such DRR programmes help increase risk awareness, and perception and help in educating others around them (King and Tarrant, 2013). Hazard awareness and knowledge of preparedness strategies is a crucial aspect of positive coping and can help children to understand the processes of natural hazards. Thus, they feel less stressed, are prepared, and have a reduced anxiety towards disasters (Ronan and Johnston, 2005).

4.3 Case study background

This article reports findings from Christchurch, New Zealand, as part of a multiple case study (Yin, 2014). The research took place in late 2014, more than three years after the Canterbury earthquakes of 2010 and 2011. The September 2010 earthquake (Magnitude 7.1) caused widespread damage to buildings and infrastructure, liquefaction and flooding in Christchurch. The February 2011 (Magnitude 6.3) earthquake devastated the city, causing the death of 185 people (Gibbs et al., 2013). During the recovery process, the needs of people with disabilities were often overlooked at the welfare centres. For example, temporary shelters were insufficiently adapted to meet the needs of wheelchair users, highlighting gaps in arrangement for those with disabilities in a response context (Mitchell, 2014). However, schools play an important role in the preparedness, response and recovery process and are often “associated with improved prosocial attitudes and behaviours” (Masten and Osefsky, 2010, p. 1035). Hence, following the 2011 earthquake, there were efforts to equip and support teachers with effective approaches as well as information to be used during the recovery process (Mitchell, 2014).

Against this background a school located 7 kilometres from the central city was selected as a case study. For purposes of confidentiality, the school is referred to as ‘the Christchurch school’, and pseudonyms are used for all participants. The school has special class units for children who have diverse disabilities. These can be one or more of: autistic spectrum disorders; learning, hearing, seeing, mobility disability; and other degenerative conditions. All participants, whose lives are often structured and managed by adults, had first-hand experience of the Christchurch earthquakes and vividly recalled the aftermath. The school gave the researchers access to one class of 10 children aged between 10 and 16 years. The setting has a high level of adult supervision with an average of (between) 1:3 to 1:4 in adult teacher-to-child ratio, indicating the high levels of support that the children required. The school described most children as having difficulty with comprehension, memory, communication, relating to others, mobility issues, anxiety at changes in routines and obsessive-compulsive tendencies. In total, these diverse disabilities produced a heterogeneous group of participants.

Two prior school visits were undertaken to seek access to the participants, firm up the research design, build rapport and establish trust with the school staff and students: strategies that are vital for focus groups (FGs), interviews and observation of the students (Boggis, 2011). Human Participants’ ethics approval was obtained from The University of Auckland, and consent (for adult) and assent (for children) was sought from all participants prior to study commencement.

4.4 Study design

This qualitative case study used FGs, semi-structured interviews and participant observations. The rationale for using multiple methods to obtain data is to triangulate evidence, increase reliability and serve to corroborate the data gathered from other sources (Baxter and Jack, 2008, Yin, 2014). The FGs and semi-structured interviews were recorded and transcribed. Coding for patterns and potential themes was guided by the six steps of thematic data analysis (Braun and Clark, 2006). Findings were analysed in relation to available literature on disaster, children and disabilities. The goal was to consider the findings in terms of their broader meanings and implications to DRR. More detail on each of the methods is outlined below.

FGs comprising 10 children with disabilities took two hours (comprising 20 minute sessions) per day for four consecutive days. The FGs adopted participatory tools to accommodate the children's disabilities, diverse interests and competencies. For example, one technique was the use of a proportional piling technique to explore participants' awareness and understanding of natural hazards within Christchurch. This technique involved participants in identifying and making a list of potential natural hazards around Christchurch. The list of hazards identified was then transferred onto coloured A4 paper by participants and placed on the floor for proportional piling. Each participant was given three red, two orange, and one purple fruit-flavoured sweets to distribute to the hazards in terms of how dangerous they were; first (most dangerous) to fourth (least dangerous) respectively was obtained, based participants' individual perceptions. The total for each hazard was obtained for ranking (Figure 4.1). Another FG activity involved assessing participants' perceptions of the content of survival kits and categorising them as either very important or important (Figure 4.2).

The rationale for FG activities was to blend in with what Mutch (2013) refers to as a continuum of engagement with children; research for, on, with or by children. Crucially for children, hazards, risks and preparedness are abstract concepts and the use of mapping (Figure 4.3) renders the concepts tangible and concrete (Gaillard and Maceda, 2009). The tools enable participants to be actively involved, that is, research 'with' children, while the researcher and specialist teacher facilitated research activities and discussions. Attention was also directed at what was unsaid (Booth and Booth, 1996) such as paying attention to body language, eye contact, eye pointing (gazing) and facial expression as additional means of communication.

The semi-structured interviews took between thirty minutes and one hour each, involved two teachers, two parents and one official each from Red Cross and Ministry of Civil Defence Emergency Management (MCDEM) Christchurch. The aim was to obtain participants' experience and thoughts on the preparedness of children with disabilities and their potential contribution to DRR.

Participant observation was undertaken to observe a pre-arranged school earthquake drill, including the actions of 'drop, cover and hold' to assess children's preparedness. Disaster drills organised by the management team in consultation with the teachers, takes place once a school term. Observation notes and photographs were taken.

4.5 Awareness and understanding of natural hazards

Knowing the types of natural hazards, their potential effects and associated protective behaviours enhances individual or collective capacity preparedness in facing disaster (Paton, 2003). From the children's FGs, participants largely showed consistency in linking natural hazards in Christchurch, potential effects and associated protective actions. For example, participants linked 'volcanoes' to 'lava', 'flooding' to 'drowning' and 'tornado' to 'violent wind'. However, it was the earthquake impacts that prompted many responses that were experienced following the 22 February 2011 earthquake, including: ground shaking, heightened anxiety, telephone communication problems, using bottled water for long periods of time, power outages, school closure, and some people permanently leaving Christchurch.

Significantly, variations in participants' perception of natural hazards risk perception was evident from the ranking activity (Figure 4.1). The percentage ranking order or the proportion of children's choices was: earthquakes (35%), tornadoes (30%), floods (22.5%) and volcanoes fourth (12.5%). The high scores for an earthquake and tornado were attributed to recent occurrence in the region in the recent past, particularly the 2011 earthquake that continue to dominate discussions among Christchurch residents. The children also had memories of tornadoes that devastated parts of the region in early 2014 (Irwin, 2014). From observation, children's perceptions appeared easily influenced by one student's insistence that tornadoes caused serious injuries and death. The teacher also added that other sources of disaster information such as the internet, media and television may affect their perception. As such, the degree of potential devastation from the top two hazards was not accurately reflected by the close scores of (35%) and (30%). Also, while some FG participants identified moving to higher ground as a protective action when flooding occurs, their understanding of landmarks beyond the school was limited due to lack of familiarity.

Figure 4.1. Participant counting fruit sweets allocations and ranking of natural hazards by proportional piling
Source: Christchurch FGs 2014

Hart and Knight (2009), highlight that Christchurch is also exposed to remotely- or locally-generated tsunami. However, the children’s perception of a tsunami hazard in Christchurch is poor. According to Lorna (pseudonym), a teacher who was interviewed for this project, this low perception of the tsunami threat reflected variations in the levels of understanding about natural hazards or an indication of ineffective disaster information and education messages in the school:

> *“There are classes that have MCDEM personnel come in and do a talk, if the students understand that sort of thing...., but not the majority of the school. They're just too low functioning, don't really understand it”.* (Lorna, teacher)

However, another teacher attributed it to children’s familiarity with water (e.g. enjoyable swimming sessions), and thus rarely associating it with disaster: a perception that may be related to how tsunami information has been passed and subsequently accessed by the children.

A potential challenge appeared to be an existing tension among the teachers and MCDEM staff on one hand and MCDEM and Red Cross officials on the other, regarding the most effective approach to deliver DRR messages. For example the MCDEM official interviewed was unsure of the success of their DRR delivery approach, and acknowledged that their messages were mainly targeted at mainstream schools. The Red Cross official was not only critical of the limited collaboration in designing preparedness messages, but also recovery resources, and gave an example following the February 2011 earthquake, when a displaced wheelchair user was turned away from a welfare centre due to lack of appropriate facilities (Phibbs et al., 2012, Phibbs et al., 2015).

4.6 Perception of safe and unsafe locations within the school

Identifying vulnerabilities and risks within the immediate environment, and preparedness strategies started with mapping and locating seating positions and other relevant class and school 'landmarks' (Figure 4.2).

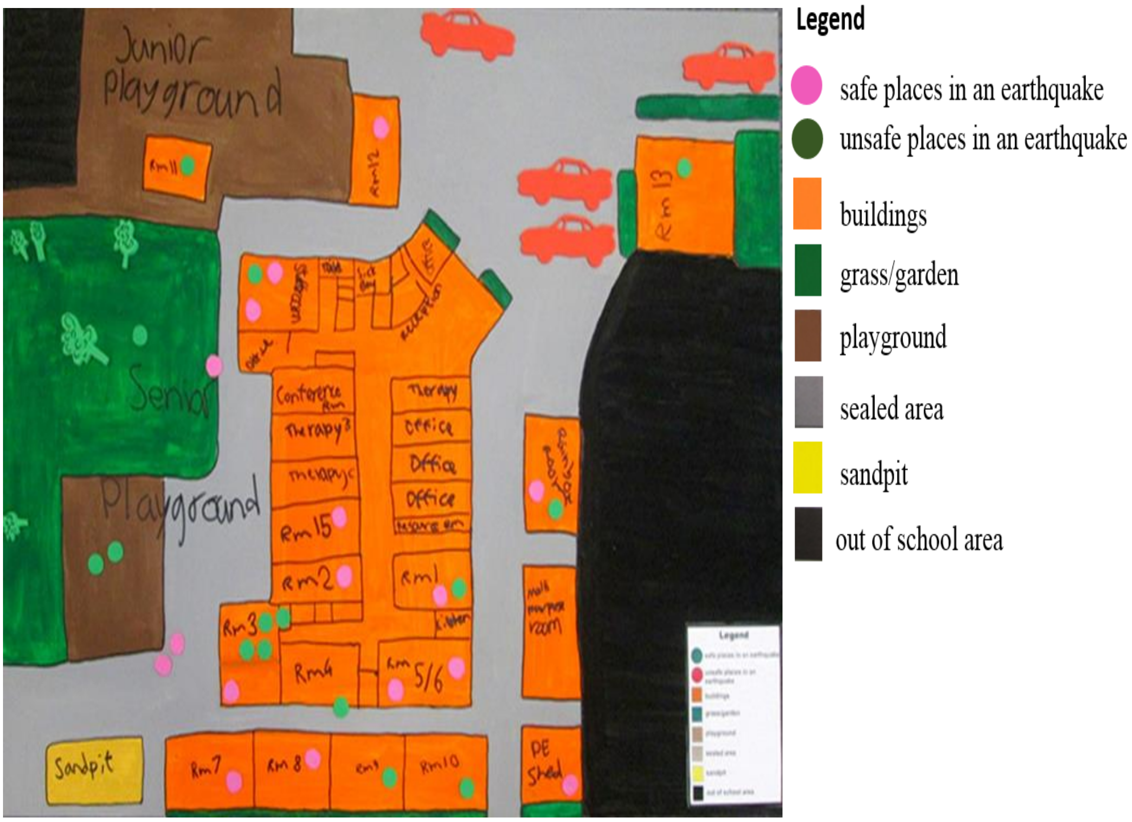

Figure 4.2: School map of safe and unsafe locations
Source: Christchurch FGs 2014

The children perceived that safe locations had tables and chairs to get under during an earthquake, including classrooms. Spacious rooms, a first aid room, and significantly, rooms and offices belonging to teachers or administration staff were perceived to be safe. All children indicated that they would feel safe with their specialist teacher. The perception of teachers or offices with adults may be a reflection of the status and power relations between children and adults who organise the children's daily lives.

> *"They do seem to know their own limits in a way, not that they could probably express it to you, but they do know that they need to rely on others and they sort of pick people that they know will be there for them*" Alicia (Teacher).

Surprisingly, a small 'rainbow room' where children go to rest when unwell and that has no desks was also perceived to be safe. Also, a play area with swings and slides frequented by children was considered safe. Another child who enjoys painting activities said he would feel safe in the paint and artwork storage room. Some children appear to link places where they derive comfort or that are associated with enjoyable experiences with safety. Nonetheless, a lack of their understanding of potential hazards in some environments could also explain such perceptions; potentially, there is a significant gap in formal DRR message delivery targeting children with disabilities.

4.7 Preparedness and protective actions

From FGs and interviews the participants showed a good understanding of the school's evacuation procedures, agreed warning signals and communication procedures particularly when an earthquake occurred. On observation of simulations, the MCDEM 'drop, cover and hold' advice was followed by most students and by others only upon prompting or observing their peers (buddy) or teachers' lead. It was obvious during evacuation simulation that their class exiting routine of lining up at an agreed safe spot and walking out in a single file made it easier to evacuate the room. One teacher advised having a disaster plan in place, practising drills in more than one location, ensuring survival kit contents will last several days, having books to read, and trying to normalise routines by improvising, singing songs and doing hand games. Overall the teachers placed emphasis on repetition of strategies:

> *"… it means lots of repetition, lots of talking, lots of, just keep doing it until its formed it into part of their routine, and normalised"* (Alicia , teacher).

However, the February 2011 earthquake tested the school's preparedness for disaster. Their immediate challenge was summed up by what one teacher described as an 'ensuing drama': challenges communicating with parents and taxis for child pick up, anxious parents rushing in to take their children from the playground, continued aftershocks, children including those using wheelchairs needed toileting, and nappy changing, while others were upset because they could not be allowed to play in the playground. Some teachers were also upset as they could not communicate with their own family members by phone. Notably, the earthquake exposed preparedness gaps and subsequently reinforced the school's need to evaluate its preparedness strategies and resources (Table 4.1) in collaboration with the local MCDEM staff.

Table 4.1: School's disaster preparedness plan

Challenges encountered during the February 2011 earthquake	*Improved school disaster preparedness plan*
Limited emergency equipment and supplies.	Acquiring class first aid kit, water bottles, radio, torch, and school emergency information, food, tarpaulins, space blankets, pinch bar and installing school defibrillator.
Ineffective school communication equipment or public address.	Loudspeaker acquired, and plans to use transistor radio if power is off.
Problems with landline phone communication.	Mobile phone networks, Twitter, Facebook and email communications set up.
Challenges handling anxious adults and child release procedure.	Designated staff co-ordinating child release and streamlining pick-up system by caregivers.
Toilet use by children amid aftershocks including wheelchair users.	Designated toilet at the assembly point and provision of sanitary supplies/equipment.
Limited safe assembly areas.	Collaboration with CDEM and identifying safe areas. Use of tarpaulins when required.
Children's and staff movement	No re-entry to buildings, students on a bus to squat between seats and be 'turtle safe'.

Source: Christchurch school 2014

Furthermore, the February 2011 earthquake prompted mainly adult participants to re-evaluate their range of survival and preparedness items, where children were involved. All FG participants and parents interviewed acknowledged participating in setting up a survival kit at their home. As revealed by the FGs survival kit activity (Figure 4.3), a lighter, first aid kit, medicine, flashlight and sleeping bag were perceived very important, by the children in a disaster event. This is a reflection of the situation in Christchurch following the earthquake, when there was no power or water. Other FG participants, mainly those who use medication as confirmed by teachers categorised medication as very important.

Figure 4.3: Survival Kit activity
Source: Christchurch FGs 2014

4.8 Participation and involvement in disaster preparedness

Noticeably from observations and interviews, children’s creativity and enthusiasm was evident when participating in preparedness activities. These included disaster simulation drills, class discussions on disaster preparedness and associated protective actions. Parents interviewed credited their children influence in re-evaluating emergency kit items, and simulating ‘drop, cover and hold’ at home, thus passing on what they had learnt at school to the home environment. An example of children’s untapped potential was given by a parent who described her son as very holistic kind of child who actively fixed up cracks and modelled earthquake scenarios in their garden to gain understanding, control and cope with natural hazards. Another parent argued that participation in already set disaster drills, in the absence of a clear understanding often causes frustration in her child. Teachers also emphasised the importance of children's involvement in designing preparedness resources:

> *"The other very powerful thing is students watching themselves. So, some way of filming them getting 'turtle safe', where they can see themselves ... they would understand it a lot better"* (Lorna, teacher)

Nevertheless, in school, children's involvement appeared to be limited to following set strategies, and their voice in DRR planning is lacking (in the school advisory group and in developing preparedness resources). Crucially, the advisory support group for staff and student safety and preparedness, brought together members of senior management and other staff members. This presents a potential opportunity for inclusive participation.

> *"So decisions aren't just made with the principal or senior managers. The decisions are made with a group of people, including our caretaker, teacher assistants, teachers, whoever wants to be on the support group"* (Lorna, teacher)

Separately, children with disabilities have their own council, and thus set routines mirrored school working systems and decision structures that reflected existing power relations. The children often need support and care and the teachers implicitly alluded to children's limited capacity in assessing and making considered decisions urgently. Consequently, the children were overlooked and their potential role masked as adults represent their views in decision making. Asked if some children would be in a position to contribute in the planning team, the teacher aptly noted:

> *"We have got some students who could be part of that but it's very routine driven"* (Alicia, teacher)

The lack of children's direct voice in DRR planning is compounded by existing mobility, cognitive and other challenges associated with disabilities when participating in disaster drills. For example, the use of a warning bell caused more stress to children with autism while the success of the ‘drop, cover and hold’ drill was varied and, inappropriate for some participants, as Lorna describes:

> *“One thing about the whole ‘turtle safe’, getting under the desk; with special needs kids it’s very hard. ...a lot of them can’t put their body under there and end up crying ...others didn’t even realise what was happening then”* (Lorna, teacher)

The teacher’s concern again presents an emerging pattern: a recurring gap in the appropriateness of protective actions for people with disabilities and MCDEM action messages. For some children, a lack of understanding may be a depiction of their limited capacity to discern risk, hence the need to consider their needs and perceptions in formulating strategies. For example, one student was reported to have been upset not because of the February 2011 earthquake but because there was a disruption to a familiar break time children’s TV programme ‘Lola’ that stopped.

4.9 Knowledge, understanding and access to resources in disaster preparedness

The study findings highlight existing variations running through from levels of hazard awareness and understanding, disaster preparedness strategies and the inherent complexity in promoting DDR initiatives among children with disabilities. Overall, the children’s awareness and understanding of potential hazards and associated protective actions in Christchurch was generally good and hence they have a potential capacity to face natural hazards. For example, the survival kit items activity bears similarities to a previous questionnaire survey carried out in a mainstream school with children aged between 10 and 12 by Finnis et al. (2004). Both studies reported that children highlighted torches, first aid kits, radios, and spare batteries as of high importance.

The research notes that children’s knowledge and understanding of natural hazards allows them to feel in control, and to take protective actions before, during and after a disaster event. For example, discussions of hazards and capacities, and preparedness activities are associated with increased capacity if the child is left alone or collective capacity if the child can help and influence others. Simulations and repetition of DRR activities translates understanding into useful disaster preparedness strategies (Ronan and Johnston, 2005; King and Tarrant, 2013) and potentially gets them through a disaster. However, the MCDEM messages and slogan 'drop, cover and hold' designed for children without disabilities is inappropriate for some children due to either mobility/physical challenges or lack of understanding. The experiences and voices of children with disabilities have not yet been considered in disaster preparedness; hence their needs have so far been overlooked. The findings also identify that tsunami awareness (a potential hazard to Christchurch) is poor, again revealing a possible gap in the design and delivery of targeted DRR messages. Such perceptions raise questions about the suitability of the design, rationale and delivery process of MCDEM resources and other DRR messages for effective access and use by children with disabilities. These findings underscore the need for further study on simple and effective approaches that consider the perspectives of children with disabilities in DRR resource design and delivery.

Importantly, there appears to be a perception among some FG participants that places of play or that are associated with enjoyable experiences are safe, signalling a varied understanding of potential hazards. Disasters often harm the physical spaces where the children learn and play, yet the children are rarely involved in the process of rebuilding the spaces. Children's' untapped social capital and creativity is vital to their involvement in DRR initiatives. For example, a parent's description of her son modelling earthquake scenarios at home presents a good example of creativity. James and Prout (1990) emphasise that children are innovative and creative. Different children use or give different meaning to the same cultural artefacts and can be actively involved in the construction of their own life (and lives for those around them). Instead, physical environment and spaces often possess inherent adult designs and values that are restrictive to children with disabilities. They often find themselves unable to integrate in the broader community (Thompson and Philo, 2004), due to the built environment and social barriers. Interventions could therefore be made more effective by prioritising children's direct and sustained engagement (Priestly and Hemmingway, 2007).

Another significant finding is children's perception of feeling safe when with teachers or adults: a possible reflection of the status and power relations between children and adults who organise the children's daily lives. Masten et al. (1990) agree that children in disasters cope better when their parents are present, and when their parents function adequately in the presence of stressful circumstances. Arguably, this perception of reliance on adults may be due to the invisible role or children's voice in DRR planning and their day to day activities. For example, adults manage their day, personal care, administer medication and transfer them in and out of wheelchairs, depicting them as incompetent, dependent and in need of protection which mask their actual capacities (Woodhouse, 2004). Consequently, Mahon et al. (1996) argue that such perceptions provide often erroneous justification to use proxies as children's representatives, including in disaster preparedness. Similarly, in this study, apart from participating in set preparedness routines, children's role and direct voice in designing DRR initiatives is lacking. This highlights a gap in disaster preparedness policy and practice that requires actively providing avenues for children with disabilities to be actively involved in matters that affect them: disaster preparedness, planning and delivery.

4.10 Concluding remarks

Children with disabilities have been overlooked in DRR initiatives and often have difficulties in obtaining access to preparedness resources in the face of disaster. This study examined the understanding, perception, experience, and preparedness of children with disabilities in the face of a disaster in the context of Christchurch. With notable variations, children show a good awareness and understanding of natural hazards and self-protective actions for disasters and can play an important role in DRR initiatives. The perception of event-likelihood and beliefs about one's ability to face and cope with a disaster is linked to an understanding of the nature of a particular disaster and levels of disaster preparedness (King and Tarrant, 2013).

The research shows that children with disabilities hold and can express views, varied perspectives, and value participation in DRR initiatives, given the right approach and environment. The study calls for developing ability-and age-appropriate resources and approaches, and targeted messages that consider and address specific requirements for children with disabilities. Progress can be achieved by enhanced collaboration, resource coordination and consistency among the relevant stakeholders in developing and delivering targeted disaster preparedness messages (Johnson et al., 2014, Ronoh et al., 2015).

This research aims to contribute to the role of children with disabilities in theory, research and practice. It calls for a supportive community and a policy framework that promotes children's well-being in DRR. For this to happen, a starting point is for such frameworks to provide avenues for children's involvement in initiatives that give a more accurate evidence base for informing improvements in disaster preparedness policy and practice. It implies removing barriers that hinder children’s active involvement from the planning to implementation phases and systematically taking up disability needs across all aspects of DRR (e.g. through personnel training and capacity building programmes).

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Chapter 5: Disability through an inclusive lens: Disaster Risk Reduction in Schools

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Abstract

Purpose – The purpose of this paper is to use an inclusive lens to explore pathways and considers, through the voices of children and adult participants, the complexities in implementing effective disaster risk reduction (DRR) in schools comprising children with disabilities. It identifies obstacles and suggests policy recommendations that consider their needs in DRR.

Design/methodology/approach – This paper draws on a case study of two schools supporting children with disabilities in the New Zealand regions of Hawke's Bay and Auckland, each with differing experiences of past natural hazards and disasters. Data from children's workshop activities, participant observation, semi-structured interviews, workshop photographs, school safety and policy documents were coded in Nvivo software to categorize data and to identify themes for cross-case analysis and discussion.

Findings – The research reveals three key pathways that schools can take in promoting inclusiveness in DRR. They are the provision of safe and accessible school building designs and facilities, avenues for children's involvement and leadership in DRR initiatives, and in decision-making processes. Schools also offer opportunities for a collaborative effort towards inclusiveness in DRR within the school and with other stakeholders.

Research and practical implications – Based on the findings, the paper suggests four broad policy recommendations for consideration towards strengthening the role of schools in disability-inclusive DRR.

Originality/value – The paper contributes to ongoing DRR efforts and adds new information to the disaster literature on the role of schools in disability-inclusive DRR.

Introduction

The literature of disaster highlights the uneven effects of natural hazards on people. It shows that children particularly can have increased vulnerabilities (Wisner, 2006; Peek, 2008; Peek and Stough, 2010; Boon et al., 2012; Ronoh et al., 2015). Children spend a major part of their week in a school environment and hence there is a need to consider inclusive DRR in schools. For example, many schools and children were affected during the 2001 Gujarat earthquake in India, the 2005 Kashmir earthquake in Pakistan, and the 2008 Wenchuan earthquake in China (Peek, 2008; Tierney, 2012). Several school-based studies and reviews provide relevant focus specific to children with disabilities. These studies describe the children’s experiences and highlight their potential vulnerability to natural hazards and disaster (Peek and Stough, 2010; Alexander et al., 2012; Boon et al., 2012; Ronoh et al., 2015). A recent example is the February 2011 earthquake in Christchurch, New Zealand, where schools and children were affected (Ronoh et al., 2015). In another example, the March 2011 earthquake in Japan hit on a school day (Johnson et al., 2014; Mutch, 2014), and triggered a widespread tsunami, resulting in extensive devastation and deaths, which included many schoolchildren (Nakahara and Ichikawa, 2013). Most, if not all, schools have children with disabilities and are therefore positioned to play an effective role in promoting inclusiveness in DRR, especially for the case of children with disabilities who are invisible or often overlooked in DRR planning (Peek and Stough, 2010; Boon et al., 2012; Ronoh et al., 2015).

The available literature on the role of schools in DRR comes from the wider DRR literature, which includes education in DRR and disasters (Luna, 2012). Also included are the three pillars of safe schools: safe learning facilities, school disaster management, and risk reduction and resilience (UNESCO, 2013). Governments rely on this broader disaster literature to provide guidelines to schools on how to develop DRR plans (Mutch, 2014). However, there is a lack of inclusiveness in DRR planning and the lack of an approach that incorporates the pillars of school safety, education in DRR and integrating children with disabilities, (Boon et al., 2012), teachers and school leaders into the local and national DRR planning (Wisner, 2006; Mutch, 2014). Disability-inclusive DRR in schools should acknowledge diversity and ensure that all those often marginalized and excluded, such as children with disabilities, participate and contribute as stakeholders in the process (Centre for Research and Policy, 2015).

Broadly, schools should provide safe structures and facilities for emergency temporary shelter for the community, and places of information and support in the face of a natural hazard (Wisner, 2006). In a disaster situation, a school may be forced to be on its own for several days, necessitating the need to draw on local resources and strategies, and thus embodying a 'bottom up' approach to DRR that helps sustain its capacity (Barnes, 2013). Therefore, children's engagement in DRR activities and scenarios can reduce vulnerabilities, improve their capacity and enhance their ability to adhere to DRR plans (Tierney, 2012; Haynes and Tanner, 2013). Numerous authors maintain that children can act as conduits for DRR education and activities in schools (Ronan and Johnson, 2005; Wisner, 2006; Mitchell et al., 2008). This involvement can translate understandings of disaster risk into useful preparedness strategies and help increase capacities for the children, their school peers, family and the wider community (Paton 2003; Ronan and Johnson, 2005).

The perception of event-likelihood and beliefs about one's ability to face and cope with a disaster is linked to an understanding of a particular disaster and the levels of disaster preparedness (King and Tarrant, 2013). Among the children therefore, reducing disaster vulnerability and enhancing capacity requires empowerment (Alexander et al., 2012), by addressing both age and disability-based inequalities that limit their 'voice' and role in decision-making (Wisner, 2002). Children are typically reliant on adults for financial and material resources and personal care and they are often excluded in decision-making processes on issues that affect their lives (Watson et al., 2012). It requires a shift in attitude and an approach that gives children 'voice', by considering their status in the society and addressing challenges associated with unequal power relation (Anderson, 2005; Kailes and Enders, 2007). This article uses an inclusive lens to explore how school DRR can consider the complexities of the needs of children with disabilities and suggests recommendations that consider these needs. The article argues that ideas about DRR are shaped by social, political and cultural knowledge and understandings (Tierney, 2012). It begins with a brief overview of disability, inclusiveness and DRR in the next section.

5.1 Disability, Inclusiveness and DRR

The literature of disasters suggests that people differ significantly in their degree of vulnerability to natural hazards (Wisner, 2002; Anderson, 2005; Tierney, 2012; Wisner et al., 2012), and this partly influences their level of involvement in DRR. Research indicates that vulnerability to disaster is associated with a number of socioeconomic factors that include income, poverty, social class, age, ethnicity and gender. Disability intersects with all these factors (Wisner, 2002; Wisner et al., 2012). A society's poor, dependent and isolated, who are also marginalized often directly or indirectly, face increased exposure to disaster risk, due to that marginalization. The main driver of loss and harm in a disaster event is 'differential vulnerability' that is socially structured (Priestley and Hemingway, 2007; Tierney, 2012). Therefore, inclusiveness in DRR should also encompass empowerment (Wisner, 2002): involvement and having a voice and role in decisions that affect one's life. This should involve an acknowledgement that hazards and disaster tend to be a consequence of human action or inaction of decisions about the allocation of access to resources and locations and the power or lack of power to make those decisions (Mueller-Mann, 2013). The approach thus needs to reflect a process rooted in life and livelihood routines and the way in which longstanding systems of social, economic and political power either provide resources and options or constrain lives and livelihoods (Wisner et al., 2012).

A challenge towards disability-inclusive DRR stems from people's perception of disability, its definition, and the implication of associated definition on the DRR policy and practice. Disability is often associated with other terms such as 'vulnerable groups' or 'special needs' and those in need of special attention/help. The ambiguity in understanding of the term 'disability' means policy and decision-makers adopt a patriarchal approach where those who have hegemony assume the less able are not capable of contributing (Wisner, 2002; Mitchell et al., 2008; Watson et al., 2012). Subsequently, people with disabilities are often rendered invisible and their needs are overlooked in top-down DRR approaches. Consequently, DRR initiatives are often designed for people who can walk, run, see, drive, hear, speak, quickly understand and respond to instructions and alerts (Kailes and Enders, 2007). People who are deaf or who have visual impairments may not hear oral instructions to evacuate or see emergency lights (Kailes and Enders, 2007). Phibbs et al. (2012) report that considerations such as building design (in relation to accessibility), use of facilities and forms of communications are often overlooked, leaving people with disabilities vulnerable to disaster effects.

For children with disabilities in school, access to vital day-to-day resources strongly influences their ability to face a disaster. Their vulnerability to disaster can be reduced if they are made visible, and included in the decision-making process (Mercer et al., 2007). Therefore, there is need to ask broader questions that could relate to DRR in everyday activities, and aspects of life at school; for example, what length a corridor should be, the width of a sidewalk, the use of elevators, practices during break time, class time, disaster drill protocols, the type of alarm/notification system, or the design of an evacuation centre (Wisner, 2002).

In schools, DRR initiatives are usually aimed at adults, teachers, school managers, or caregivers, not children with disabilities (Boon et al., 2012). Such information/guidelines, largely advisory in nature, often views disability from a medical perspective. These are policies that require a top-down approach, that presume the dependence of children upon adults and disregard situations in which there may not be anyone to assist the person in question (Wisner, 2002). Subsequently, this affords insufficient consideration to DRR planning among children with disabilities (Boon et al., 2012). The approach renders children with disabilities without a 'voice', and overlooks their views on DRR (Wisner et al., 2004; Anderson, 2005). In turn, their capacity to effectively participate and contribute is limited, resulting in a lack of access and unequal opportunity. Tierney (2012) contends that confidence and collective capacity do not develop among those constantly shown that they are powerless.

For DRR to be inclusive, it needs to incorporate three components: recognize different forms of knowledge to address disaster risk, take action at different levels/scales, and involve a large array of stakeholders (Gaillard and Mercer, 2012). The participation of children with disabilities in DRR (Centre for Research and Policy, 2015) and the idea of disability-inclusive DRR in schools are also in line with the global comprehensive school safety framework (UNESCO, 2013). Its core emphasis is on pillars of safe schools through child-centred, child-participatory efforts in recognizing children's rights to safety and protection. In schools, achieving inclusiveness in DRR rests with empowerment, by facilitating access to resources to enhance children's capacities: sets of knowledge, skills, and resources for dealing with natural hazards and disasters (Cadag and Gaillard, 2014). The ability to mobilize resources, share and apply knowledge, the ability to connect across group lines and the capacity for collective action strengthens inclusive DRR (Tierney, 2012). Therefore, this study provides an inclusive lens to explore constraints and pathways towards a disability-inclusive DRR in two New Zealand schools, described in the following section.

5.2 Multi-Case Study and Data Collection Methods

This article draws on findings from two schools that work with children with disabilities in the New Zealand regions of Hawke's Bay and Auckland. They form part of a multi-case study (Yin, 2014). Specific to this paper, the case study research aims were twofold:

1. To understand why schools present important avenues to provide for inclusiveness in DRR that consider the needs for children with disabilities.
2. To demonstrate that inclusiveness in DRR revolves around the societal structures that determine both the availability and access to vital day-to-day resources that enhance capacities and reduce vulnerability in the face of a disaster.

The two case study areas reflect differing geographical locations (Figure 5.1) and experiences of past natural hazards and disasters. The Hawke's Bay region experienced the 1931 earthquake (magnitude 7.8) that caused damage to housing, buildings and infrastructure and the death of 256 people across the whole region (Hill and Gaillard, 2013). The Auckland region, on the other hand, has not experienced a major disaster event in the recent past, although volcanic eruptions, tropical cyclones, floods and tsunamis are potential natural hazards for the region (Newham et al., 1999). The suitability and strength of a case study rests in its power of attention to the local situation. This is central when research intends to address both descriptive questions (e.g. what is happening) and explanatory questions (how and why something is happening) (Yin, 2014). The approach helps in making meanings others have about the world (Creswell, 2013; Thomson and Philo, 2004), in this case through 'child centred' participatory tools.

5.3 Accessing Children with disabilities as participants

In each school, two prior school visits were undertaken to seek access to the participants, firm up the research design, build rapport and establish trust with the school staff and students. This is a strategy vital for focus groups, interviews and observation of the students (Nind, 2009; Boggis, 2011). The schools have special class units for children who have diverse disabilities, which can be one or more of: autistic spectrum disorders; learning, hearing, seeing, mobility disability; and other degenerative conditions, producing a heterogeneous group of participants. Workshop participants (comprising a class of 8-10 children), who were aged between 10-16 years, required some level of adult support as indicated by the high numbers of adult teacher-to-child ratios of between 1:2 and 1:4. The schools also indicated that most children have

Figure 5.1: Map of New Zealand- case study areas
Source: Created using ArcGIS

difficulties in comprehension, memory, communication, relating to others, mobility issues, anxiety at changes in routines and obsessive-compulsive tendencies. For two of these children in Auckland, English is their second language.

The prior visits were also critical in finalizing the research design where the research goals, associated methods and tools were arrived at with the school principals, teachers and boards prior to obtaining research ethical approval. The researchers and specialist teachers became research facilitators, providing clear and simplified information including pictorials (Nind, 2009). The rationale for the use of inclusive participatory tools was to engage and empower children by giving them a voice and greater participation in DRR research.

5.4 Data Collection Methods

The findings draw on a study conducted over 20 months. Data gathering methods involved focus group activities over a four-day workshop in each school with children with diverse disabilities. The rationale for FG activities was to blend in with what Mutch (2013) refers to as a continuum of engagement with children; research for, on, with or by children (Also see Ronoh et al., 2015). The research design and activities enabled the engagement of children with the disabilities through participatory tools (Ronoh et al., 2015), allowing participation along children's spectrum of abilities (Nind, 2009). It involved mapping activities of safe and unsafe areas of their class and the school during a disaster, and proportional piling of identified potential natural hazards in the region (Figure 5.4). This technique involved participants in identifying and listing potential natural hazards around their school. The participants then transferred the list of hazards identified onto coloured A4 paper and placed them on the floor for proportional piling. Each participant was given three red, two orange, and one purple fruit-flavoured sweets to distribute to four potential hazards according to an agreed order: 1st (reds for most dangerous) to 4th (least dangerous) respectively, based on their individual perception of associated disaster risk. The total for each hazard was obtained for ranking (Figure5.4). Fruit-flavoured sweets were chosen for this activity with an aim of capturing children's interest in the activity, while the different colours helped in guiding the structure/sequence of distribution among the children. Another activity involved assessing participant's perception of the content of survival kit items, and categorizing them as either very important or important (Figure 5.5).

It also included fourteen semi-structured interviews with two teachers, two parents and one official each from Red Cross, District Health Board and the local Civil Defence in each region, interviewed for between thirty minutes and one hour. The aim was to obtain participants' experience and views about the schools' role in disability-inclusive DRR. The workshop activities and semi-structured interviews were recorded and transcribed for data coding. Observation was also made during disaster drill of "drop, cover or hold", for earthquakes and evacuation of tsunami (Johnson et al., 2014) to assess the children's role and its appropriateness. The rationale for using multiple collection methods is to triangulate evidence, increase reliability and serve to corroborate the data gathered from other sources (Baxter and Jack, 2008; Creswell, 2013; Yin, 2014).

The workshop activities and participatory tools allowed a continuum of engagement with children (Mutch, 2013); research for, on, with or by children. The tools therefore encouraged participants' active involvement and analysis: research *with*, rather than *on* or *about*, children. Attention was equally directed at what was unsaid (Booth and Booth, 1996): paying attention to body language, eye contact, eye pointing (gazing) and facial expression as additional means of communication.

For data analysis, the author used the workshop data set, participant observation memos, semi-structured interview transcripts, workshop photographs, school safety and policy documents and field notes coded in Nvivo software. The author categorized data and identified patterns and potential themes as guided by the six steps of thematic data analysis (Braun and Clark, 2006). The steps ranged from clear data familiarization and generation of initial codes, to defining and naming of themes. The coding process resulted in eleven categories and twenty-five sub-categories, including five categories relating to the role of schools in DRR. These five categories were further consolidated into two broad themes named and defined in the next section. For the cross-case analysis/process, first there was coding of each data source from each school. Second, coded data was analysed independently to establish patterns and/or concepts that made initial themes. These were compared and contrasted vertically (within each case) and then horizontally (cross-case analysis) (Yin, 2014) to arrive at the final two themes below. Findings were then analysed in relation to the available literature on children, disabilities and disaster.

5.4.1 Research Findings: The role of schools in DRR

This section discusses two broad themes from the data that relate to the pathways towards inclusive DRR in schools. The themes are: (1) Enabling accessibility, safety and inclusiveness in schools, and is presented separately in each of the two cases, (2) Avenues for children's involvement and leadership in DRR decision-making process, presented as an integration of the two cases (Yin, 2014).

Enabling accessibility, safety and inclusiveness in schools

Schools are, ideally, disability-inclusive environments with safe and accessible structures, locations and spaces in the face of natural hazards (Wisner, 2006). UNESCO (2013) recommends that school design, site and construction be undertaken with potential hazards in mind, and specifically consider incorporating continued access and safety for children, parents and other adults with disabilities who visit or work in schools. The Hawke's Bay school is a good example.

Inclusiveness in Hawke's Bay school

A teacher interviewed attributed the strategic location of the Hawke's Bay school at a higher ground to a previous flood and the 1931 earthquake experiences. In addition, the teacher identified multiple entry and exit points accessible to children and adults using wheelchairs, spacious buildings able to host children, teachers, and their families and residents often displaced during floods, providing important local resources as an evacuation shelter in a disaster.

Further interviews with children and teachers, and the school records confirmed that the Hawke's Bay school undertook disaster drills periodically. On observing an earthquake disaster drill at the school, there was a clear demonstration of a structured evacuation and exit strategy. A siren accompanied by audible instructions and flashing lights meant accessibility of warnings to children with various disabilities (e.g. hearing and visual impairments).

> *When the siren goes, we go to the nearest exit and straight to assembly ground. At Hawke's Bay School, our assembly point is at the big playground* (Student, Hawke's Bay).

A follow-up reflection of the disaster drill by school staff provided a potentially inclusive avenue to share feedback among both staff and the children for future improvement.

> *The evacuation was a planned trial evacuation. At the assembly point, classes assembled and stayed together in their groups, which assisted in quickly accounting for everybody (...). Two students were removed from the school*

> *building prior to trial evacuation due to anxiety over fire alarms* (evacuation report, Hawke's Bay).

However, several gaps to inclusiveness in the drill emerged. For example, children were excluded during the planning and reflection stage and only followed set instructions and prompts. Another gap was the withdrawal of two children from participating due to anxiety issues, who would have had to evacuate in a disaster situation. The assumption was that adults make responsible and appropriate decisions and choices about risks the children may face (Peek, 2008), masking the capacity of the children and opening a possibility of exploiting the uneven power relationship between adults and children.

A parent interviewed was supportive to disaster drills, but was critical of the use of both a loud siren and loud audible instructions to the children, particularly to those on the autistic spectrum.

> *Loud alarms during drills can seriously affect their health and well-being (...). Research is already there; (...) excessive noise can be painful and disorienting to autistic kids* (Parent, Hawke's Bay).

This is yet another pointer to the complexity of achieving a disability-inclusive DRR, and associated initiatives among this group. There exists tension between meeting the individual needs of some students versus the necessity to provide hazard warnings.

To provide a cross-case comparison (Yin, 2014), figures 5.3 and 5.4 present results of a proportional piling activity in Hawke's Bay and Auckland. Children used fruit-flavoured sweets to distribute to the hazards from first (most dangerous) to fourth (least dangerous) respectively, based on individual perception. This result suggests that children's access and involvement in DRR initiatives within and outside school contributes to an increased awareness of natural hazards within their region.

Figure 5.2: Potential Natural hazards in Hawke's Bay
Source: Hawkes Bay FG

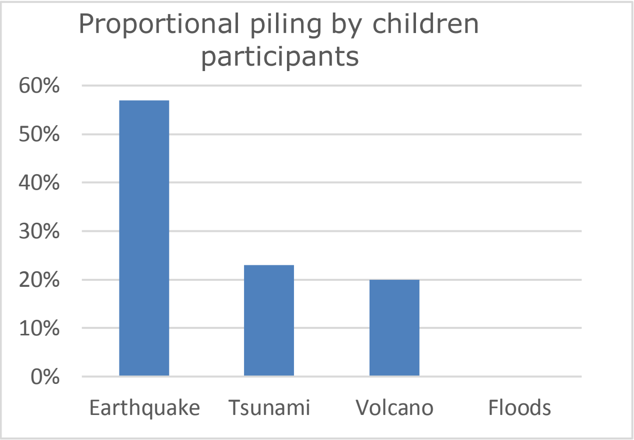

Figure 5.3: Potential natural hazards bar chart
Source: Hawke's Bay FG

<u>Inclusiveness in Auckland school</u>

The Auckland case study findings appear to reflect the low priority accorded to DRR initiatives by school/community. The Auckland school, for example, is located within a tsunami evacuation zone, has poor building design: small sized classrooms, large glass windows and lacks a clearly designated evacuation point, signalling the schools' other pressing concerns that confound inclusive DRR efforts.

> *The school sits just inside the yellow evacuation zone, adjacent to a safe area (…). The evacuation of disabled children can be a challenge; however, the distance required for moving students to a safe point is not far* (Civil Defence, Auckland).

Interestingly, the teachers and the children interviewed were unaware of this potential tsunami hazard. This was probably an indication of challenges to Civil Defence top-down DRR communication of information and possible exploitation of power relations. Consequently, children with disabilities who were at the bottom end of the top-down 'communication hierarchy', and particularly those having mobility challenges were unaware of and thus unprepared for a potential tsunami hazard. As such, the proportional piling activity to assess children's hazard awareness (Figure 5.4) places tsunami hazard second from the bottom of the rank.

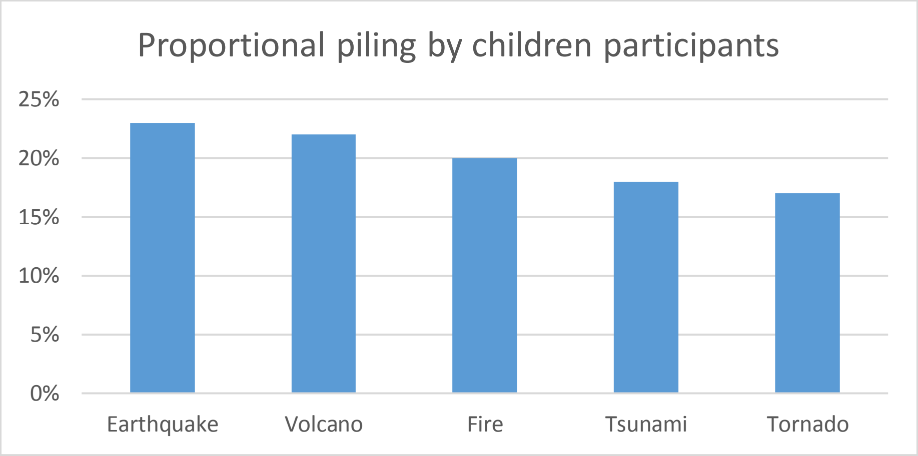

Figure 5.4: Potential natural hazards bar chart: Auckland 2014
Source: Auckland FG

Teachers were more concerned about the absence of children's involvement in hazards and disaster drills at the Auckland school, rather than the lack of roles assigned to the children in DRR.

> *Unless a disaster drill was done before I got here two years ago (...). For the time I have been here (...), none. It is supposed to be once a term (...). It is quite a worry not to practice it* (Teacher, Auckland).

According to the teacher, the involvement and engagement of children with disabilities in such DRR activities is essential before they can take up leadership roles, as discussed in the next section.

5.5 Children's involvement and leadership in inclusive DRR

Another significant role of a school is to provide opportunities for spaces where children can take leadership responsibilities and thus promote inclusiveness in the DRR decision-making process. The 'child-centred' workshop activities of mapping, proportional piling and survival kit items (Figure 5.5), enabled children the options of working individually with adult support, in pairs, or in groups, applying teamwork and providing leadership opportunities among themselves. The use of participatory tools conducted on the floor helped to limit eye contact, attenuate and lessen the problems associated with uneven power relations among adult and children (Mercer et al., 2008).

In Hawke's Bay, children categorized 'important' and 'less important' items in an emergency survival kit. 'Important' referred to what would be necessary in the face of the top potential hazard (earthquake). Children with speech impairments relied on visuals in the 'child-centred' cut and paste activity, confirmed their choices by either pointing at pictures that acted as catalysts to stimulate memory (Nind, 2009) or nodding, while others would proudly talk and justify their choices.

> *"I will need drinking water and plasters in my survival kit to make sure no one is injured, or gets injuries"* (Student, Hawke's Bay).

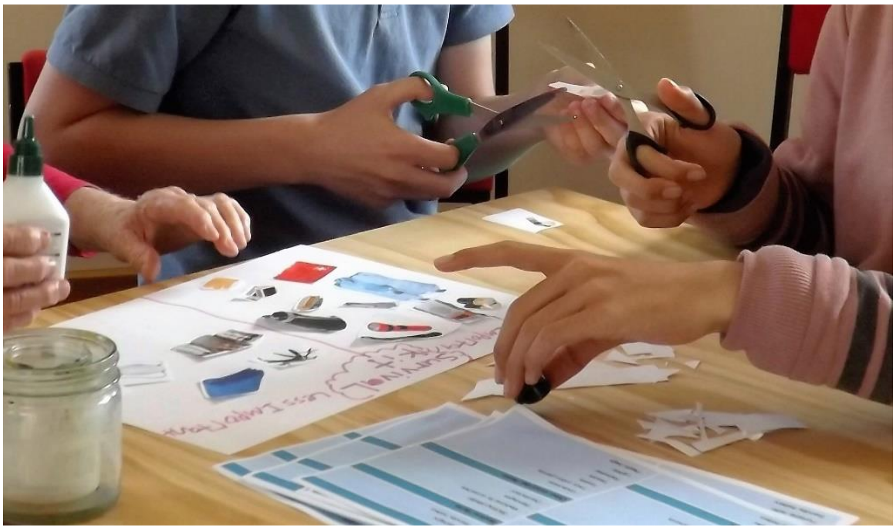

Figure 5.5: Students cutting and pasting survival kit items
Source: Hawke's Bay FG

Significantly, a Hawke's Bay teacher interviewed described the positive value of involvement among children with disabilities in targeted DRR activities.

> *I took five students in the group, which participated in our workshop last time, (…) to a natural disaster workshop organized by Hawke's Bay Civil Defence and a team from Christchurch. The workshop had activities around assessing the students' awareness of natural disasters in Hawkes Bay* (Teacher, Hawke's Bay).

The teacher believed that children's involvement in the workshop offered them a critical opportunity to hear and learn first-hand specifically from persons with disabilities in attendance who had experienced the February 2011 Christchurch earthquake. These activities helped empower the children through improved self-confidence, leadership and problem-solving skills, which subsequently promote safety awareness culture in the school community. The students reportedly came away with increased confidence and later took the lead in a DRR mapping presentation to a school parents-teachers meeting. The Auckland school also presented instances of teamwork activities, and displayed vital decision-making capacity and leadership potential. The teachers admit such strengths can easily be channelled to DRR initiatives.

> *For example, some take up leadership roles in creating documents, posters, creating books, buddying up and helping a younger student. (...) We have about ten students in the school (...) able to do that* (Teacher, Auckland).

To explore leadership among children further, students were asked how they could help their peers. Due to speech limitations, a student in Auckland school gave a short response "I can keep them safe", and with further probing "because I am a strong girl" and identified a boy in class she would support if disaster happens. "He has no clue of where to go. He can't see", referring to a student with multiple disabilities that include blindness. A Civil Defence official interviewed acknowledged children's inherent capacities and their silent leadership role in DRR.

> *Some of them tend to be very good at it already, though looked at oddly (...). I often see a child with disability with a backpack all the time and you start thinking why (...). Well, actually he has an emergency kit on his back. He doesn't want to tell you (...) and he is actually ready to rock and roll.* (Civil Defence, Hawke's Bay).

Such apparent initiatives by the children need to be nurtured and encouraged by adults through a shift in attitude (Kailes and Enders, 2007) to inclusiveness. Parents interviewed acknowledged children's inherent capacities in school DRR, though insisting on further inclusive opportunities such as role-plays with a wider stakeholder involvement and support.

However, even though the Auckland children identified important survival kit items, their justifications for including specific items were not directly linked to a potential natural hazard in the region such as a tsunami hazard (Figure 5.4). This possible mismatch calls for re-consideration of DRR messages and delivery approach (Ronoh et al., 2015). Teachers were also not aware of the school's location at a tsunami evacuation zone, revealing a potential disconnect between the school and local Civil Defence and again, probably due to power relation challenges leading to ineffective collaboration, a fundamental element of an inclusive DRR.

Another Civil Defence staff interviewed outlined how they engage the children with readiness information using initiatives such as ‘What's the Plan, Stan?’ and ‘Turtle Safe’ interactive messaging geared for younger children. Though the approach emphasized a systematic process for disaster drills, it is more of a top-down approach where the children’s role in planning is invisible, and with an assumption of easily moving wheelchairs during an earthquake.

> *For kids with disabilities, the approach is show, demonstrate, and practice. (...) You are telling them, then showing them, and then getting them to do it, which is get them to actually practice the “drop cover and hold” (...). Those using wheelchair (...) discuss the different options like (...) move them against a wall rather (...) where it is less likely to have something fall on them* (Civil Defence, Hawke’s Bay)

An interesting observation came from the children participant’s interpretation of DRR readiness messages. Teachers interviewed often referred to children with disabilities as ‘literal’ learners who require simple and inclusive DRR messages. Teachers gave an example of children’s interpretation of the Civil Defence’s “drop, cover and hold” slogan and that for some ‘drop’ means to literally fall. Surprisingly, this literal understanding became evident when students answered a question describing what they would do in an earthquake. Responses included “hide under a table”, “hide under a long table” and “hide in a cupboard”. In addition, when asked about what advice he would give to a younger child in an earthquake, another student replied, “I would pretty much tell them to get under their desk and hold the side of their desks” (Student, Auckland). The word ‘hide’ for children may imply concealment or, more literally, “out of sight” from potential disaster risk, a further reason to consider children in DRR planning, messaging and decision-making.

A point of convergence among all the school stakeholders; teachers, parents, Red Cross, District Health Boards and Civil Defence was their acknowledgement of the critical importance of inclusiveness in DRR. Teachers singled out participation from parents and caregivers in supporting the children as significantly strengthening inclusiveness in school DRR. Parents acknowledged the teacher's role in making a bridge between children and caregivers, and children with other stakeholders, particularly facilitating dialogue among all stakeholders; thus promoting inclusiveness in DRR.

5.6 Exploring Disability Inclusive DRR in Schools

The research findings from Hawke's Bay and Auckland schools in New Zealand, though showing some contrasting features, demonstrate that schools can play a vital role in inclusive DRR as follows:

First, the research identifies the significant role of the school location and accessible building designs as a resource for children with diverse disabilities and as a community shelter during a natural hazard as in the case of the Hawke's Bay school. In contrast, the location of the Auckland school in a tsunami evacuation zone and in an area with frequent gang-related incidents is probably a reflection of wider resource deprivation and other pressing concerns in the area. The 'absence' of a major disaster in Auckland may have contributed to peoples' attitude/perceptions of natural hazards and further reflects the schools' limited engagement in DRR initiatives, subsequently overlooking the needs of children with disabilities. It also signals challenges that compound inclusiveness in DRR: the existing overlaps, potential exploitation of power relations and gaps in the implementation of DRR policy guidelines. While the Civil Defence provides DRR guidelines, the Board of Trustees oversees school management practices, and is loosely 'monitored' by the Ministry of Education. That is why the comprehensive school safety framework (UNESCO, 2013) recommends that developing, training and institutionalizing school committees with participation from students, parents, school staff, and community stakeholders empowered to lead inclusive DRR efforts provides a credible way forward.

The second role is that schools nurture inclusiveness and supportive relationships such as encouraging buddy systems, teamwork and leadership opportunities through involvement in DRR. Schools can also go further to support and fine-tune the wordings of some DRR messages, such as "drop, cover and hold" by including consideration of children's views in DRR messaging (Mitchell et al., 2008). Some examples suggested by the children are 'get' or 'hide' under a desk instead of the word 'drop' that might imply 'fall', highlighting the complexity for the provision of more inclusive opportunities to involve them in DRR planning.

Importantly, children's involvement in DRR activities provides a tangible component that helps them understand the rationale behind a procedure, allows children to apply knowledge of protective actions, strengthening their capacities and according them problem-solving opportunities (Johnston et al., 2014).

Third, schools offer opportunities for strengthening partnership and collaborative effort towards inclusive DRR within the school and with other stakeholders. Again, the Hawke's Bay students undertook to share their DRR knowledge through presentations and maps during a school parents' day. Students were also involved in a DRR workshop within the region, organized by the Hawke's Bay Civil Defence. Since a child is often 'embedded' within the family, school, and community, the relationships means that DRR information may be continuously re-affirmed (Mitchell et al., 2008). The question for schools is how their participation can be further encouraged to promote inclusiveness in DRR decision-making process. In the current research, for example, opportunities for further collaboration in DRR initiatives exist in the form of stronger networks, including Civil Defence, Red Cross, and District Health Board. Notably, obstacles to inclusive DRR pertain to the nature of knowledge, abuse of power relationships, institutional structures and methodological challenges (Gaillard and Mercer, 2013). Hence, there is need for participatory tools that enable dialogue and allow all stakeholders to be part of the same activity, around the same table and at the same time.

In a disaster, a school may be on its own for several days, necessitating a bottom-up approach to inclusive DRR that helps sustain a community's capacity (Barnes, 2013). Inclusive DRR in schools should thus rely on sharing knowledge among stakeholders, searching for consensus in identifying issues/dangers and collaboratively designing corrective actions in a process that ultimately integrates top-down and bottom-up actions.

5.7 Conclusions and Recommendations arising

This article draws on findings from two schools supporting children with disabilities in New Zealand. The paper identifies that the inadequacy of inclusive DRR in schools is a consequence of the absence of children with disabilities' 'voice' in planning, and that disaster risk is therefore a social product of ignoring children in DRR (Tierney, 2012). Possible communication or exploitation of power relations at various levels compounds the inclusiveness challenge. A further lack is a platform for dialogue among stakeholders, while limited resources or other pressing concerns add to the complexity of achieving an inclusive DRR in schools. The article calls for a bottom-up and top-down approach that links together, incorporates 'voice', and gives access and safety to children with disabilities to school facilities. The approach should be in line with the three pillars of comprehensive school safety (UNESCO, 2013). The article offers four intercalated and interwoven recommendations for consideration.

- Incorporate continuous access and safety in the design and construction of school facilities for children parents and adults with disabilities who visit or work in school.
- Involve children with disabilities in DRR planning and initiatives including consensus-based DRR messages. There is also the need to incorporate the needs of children with diverse disabilities, for example by supporting students develop individualized disaster plans within the school context.
- Incorporate a shift in attitude to children with disabilities as active participants in DRR, and use participatory approaches/tools that engage, give voice to support children's empowerment and enhance DRR that reflects the needs of children with disabilities. In particular, child-centred participatory tools help in addressing potential challenges associated with uneven power relations between adults and children, a crucial ingredient in inclusive DRR efforts: each group uses its own strengths, skills, and expertise.
- Establish a platform and a network of collaborators: the school, stakeholders and government policy makers empowered to coordinate DRR activities where children with diverse abilities are included in decision-making process. This means extending and linking DRR that considers diverse abilities and disabilities and other age-appropriate programmes, or even identifying potential natural hazards a school may be exposed to, including vulnerabilities and capacities (within their school). Such activities include agreeing on warning signals for potential hazards, associated protective actions, planning evacuation routes and meeting points, identifying vehicles and shelters, and preparing an emergency kit and resources to cope with the disruption of daily life (Wisner et al., 2012).

Although this study focuses on two particular case studies in New Zealand, the findings are relevant to other schools in other countries. Indeed, most schools have students with diverse disabilities, and DRR needs to be inclusive with them in mind. The article adds new information to the disaster literature that specifically considers the complexities of inclusive DRR and disabilities. The research findings identify schools as having a crucial role in providing an accessible, safe and inclusive learning environment and resources for children with diverse abilities. This article therefore re-emphasizes the need for continued opening and active creation of formal and informal spaces in schools within DRR decision-making structures, where children with disabilities can play active roles as stakeholders.

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Chapter 6: Children with Disabilities in Disability-Inclusive Disaster Risk Reduction – focussing on school settings

Ronoh S., Gaillard J.C. and Marlowe J. (2017) Children with Disabilities in Disability-Inclusive Disaster Risk Reduction – focussing on school settings. Policy Futures in Education, 15 (3), 380 – 388.

Abstract

Every year, worldwide, disasters affect approximately seven million children with disabilities (Peek and Stough, 2010; United Nations Children's Fund, 2007), highlighting their potential vulnerability. Although there is a growing move internationally to promote the rights of children with disabilities, they still receive little attention from disaster risk reduction (DRR) researchers and policy makers. They are often excluded in DRR initiatives and are portrayed as "helpless" in disaster contexts. This policy brief draws on a multiple-case study of three schools supporting children with disabilities in three New Zealand regions. Through the voice of both children and adult participants, the study identifies associated gaps and constraints to disability-inclusive DRR. It makes recommendations that acknowledge diversity and ensures that those marginalized can become stakeholders (Handicap International, 2014) in the DRR process.

6.1 Inclusive DRR overview

One of the principal resources overlooked in DRR planning remains the skills and capacities of children with disabilities. The United Nations Convention on the Rights of Persons with Disabilities (Article 11) provides fundamental legal instruments aimed at protecting and promoting the fundamental rights of persons with disabilities (United Nations Convention on the Rights of Persons with Disabilities, 2006). Alongside the Sendai Framework for disaster risk reduction (SFDRR, 2015), the topic of people with disabilities in DRR, is further strengthened within the international policy and practice discourse on DRR (Stough and Kang, 2015). Schools, where children spend most of their lives, offer critical avenues towards achieving disability-inclusive DRR in line with the global comprehensive school safety framework (United Nations Educational, Scientific and Cultural Organization, 2013). The framework emphasizes three school safety pillars: safety, DRR education and integrating children in DRR, through child-centred, child-participatory efforts in recognition of children's rights to safety and protection. Crucially, the framework anchors key disability-inclusive DRR principles. These policy guidelines and principles recommend a twin-track approach (CBM, 2013) to accessing DRR initiatives, comprehensive accessibility, universal building design and non-discrimination, coordination and collaboration in all DRR efforts (CBM, 2013; Handicap International, 2014).

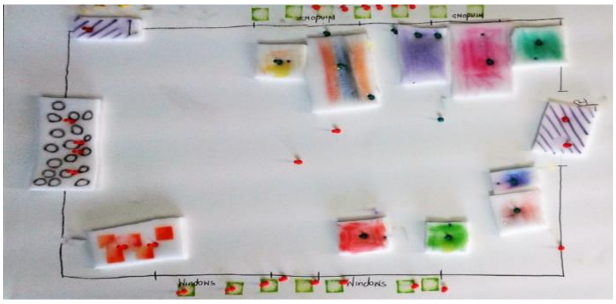
6.2 Study background and methods

This policy brief reports on fieldwork carried out from August 2014 to April 2016 as a multi-case study in three schools working with children with diverse disabilities, from each of three regions of New Zealand: Hawke's Bay, Auckland and Christchurch. The study areas reflect their differing geographical locations in New Zealand and their differing experiences of past disasters. Fieldwork activities began following consultation and planning with the school management, before obtaining a research ethics approval.

6.2.1 Data Collection Methods

Data gathering methods incorporated a four-day workshop of child-centred participatory tools (Table 6.1). These involved mapping of potentially safe and unsafe areas of their school during a disaster. The children did a proportional piling activity to show their perceptions of natural hazards and to enable hazard ranking (Figure 6.2). Each participant was given three red, two orange, and one purple fruit-flavoured candies to distribute to the hazards, 1st (most dangerous) to 3rd (least dangerous) respectively, based on individual perception. In addition, participant observation of disaster drills of both "drop cover and hold", and/or tsunami evacuation drill, as well as semi-structured interviews were undertaken. The interviews involved children with disabilities, teachers, parents/caregivers and a local representative each from Red Cross, local Civil Defence and health officials.

Table 6.1: Data collection methods

Method	Purpose	Example
Proportional piling	Assessing children's understanding, assessment and ranking of potential natural hazards	 *Figure 6.1: Proportional piling, Hawke's Bay 2014*
Class and school mapping activities	Identifying hazards, vulnerabilities and capacities within the class and school	 *Figure 6.2: Safe and unsafe classroom spaces, Auckland 2014*
Survival kit items.	Obtaining children's perspectives to categorise survival kit items between most important and less important in a disaster.	 *Figure 6.3: Survival kit items, Christchurch 2014*

6.3 Potential Study limitations

Working among children with disabilities involved a delicate balance between when to rely on student's voice or on input from the teachers or caregivers who would often correct or clarify children's assertions. This was largely a result of inconsistencies between what students would say and what happened in reality, or those who would exaggerate their abilities or understandings. Importantly, teachers and caregivers provided support and help in assembling and annotating the maps, with the children providing relevant explanations. The research captures experiences from children who attend school, but another limitation is that the study may not apply well to cases from less developed countries where most children with disabilities probably do not attend school (Kuper et al., 2015).

6.4 Highlights of Children's awareness and understanding of natural hazards

Children with disabilities showed a high level of awareness and understanding of natural hazards (Figures 6.1, 6.2, 6.3 and 6.4).

- They consistently linked potential natural hazards with their potential effects and associated protective actions. For example: participants linked earthquakes to 'violent shaking' and associated them with tsunamis, 'volcanoes' with 'lava', 'flooding' with 'drowning' and 'tornado' with 'violent wind'.
- Significantly, the children identified available resources within the school; necessary in the face of a natural hazard, e.g. a water tank for clean water supply, spacious and accessible buildings in an earthquake. They also identified unsafe spaces to avoid should a natural hazard occur e.g. near a power line, a glasshouse or a water tank (Figure 6.4).

Figure 6.4: Hawke's Bay School map: Safe and unsafe areas labelled with green and red pushpins respectively, as drawn by children with disabilities.

A local Civil Defence official interviewed provided a fitting summary to their understanding:

> *"They actually understand a lot about disaster (...) what happened in Christchurch and other places (…). They know more than people give them credit for I think, but not necessarily on what to do and how to prepare."* (Civil Defence official).

DRR initiatives therefore require approaches that consider perspectives and capacities of children with disabilities when faced with a natural hazard. However, evidence of children's involvement in DRR planning was lacking. An Auckland school teacher interviewed reported her concerns of the children not having practiced termly DRR drills for more than the two years she has been at the school. In the Christchurch school, though the children took part, they largely following set DRR strategies, and they had no voice in planning (particularly in the school advisory group and in developing DRR resources). A teacher interviewed conceded that, though some students had the capacity to assess and make considered decisions urgently, school routines and timeframes would not allow their inclusion. "We have got some students who could be part of that but it's very routine-driven" (Teacher, Christchurch). Instead, the students have their own student council but this overlooks their potential capacities:

> *"People don't spend enough time with these children to realise that they can actually get the message across to them. One thing that I have learnt with my son (with disability) is that where you tell other children something three times, I have to tell my son over ten times….and they are not ignoring you*" (Parent, Hawke's Bay).

6.5 Recommendations: Potential way forward for Disability-Inclusive DRR

The policy brief reinforces the need to consider a wide array of vulnerabilities alongside capacities of children with disabilities in DRR within the comprehensive school safety framework (UNESCO, 2013). It recommends proper resource and policy provision, disability support strategies and the use of flexible participatory tools and approaches for inclusive DRR planning. The recommendations aim to strengthen children's potential towards achieving disability-inclusive DRR (Figure 6.5) and outlined below.

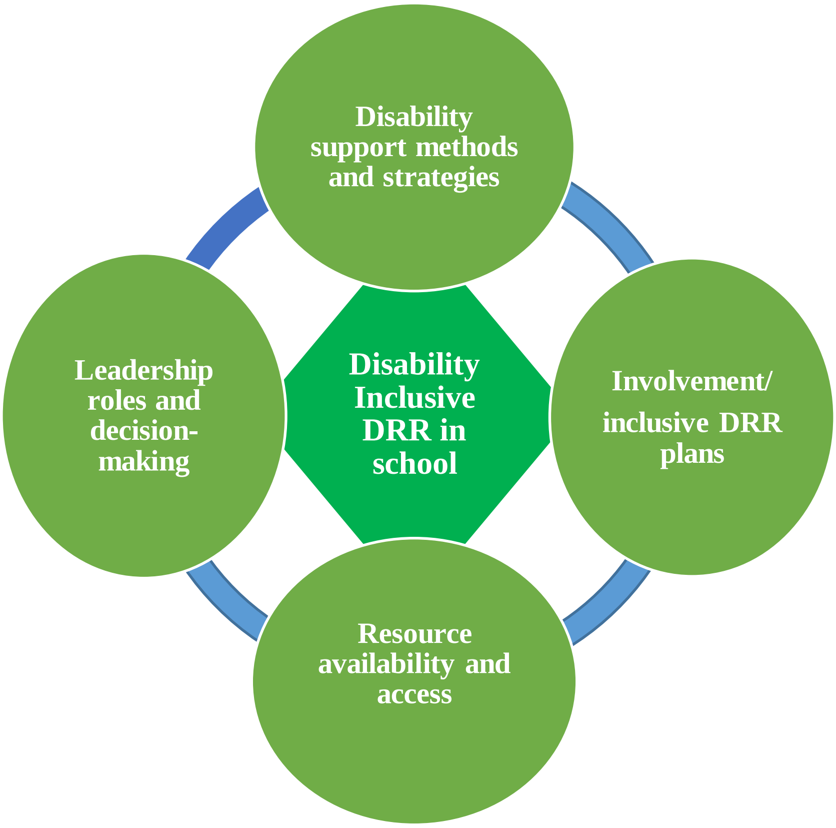


Figure 6.5: Strengthening children's potential in DRR

1. Resources availability and access policies
    - Policy provision that require new schools to be sited in safe locations and to ensure that existing schools have structurally safe and flexible building designs accessible to children with diverse disabilities in the face of natural hazard. School managers and government policy makers should consider incorporating building codes for new schools or upgrades of them that consider potential hazards appropriate to the geographical and risk location of the school.
    - Establish and strengthen partnerships with relevant stakeholders such as Red Cross, local health officials and local civil defence organizations. This could be through a school board that addresses existing gaps and overlaps in policy implementation, a potential policy gap in schools.

2. Develop participatory tools, methods and strategies that enable children to access and use DRR resources.

- Use children's untapped potential by designing natural hazard (e.g. earthquake) scenarios in their school so they can gain tangible experience and a clearer understanding of reasons behind DRR plans such as swift evacuation procedures.
- Infuse and integrate age and ability-appropriate DRR education (UNESCO, 2013) and initiatives throughout the school curriculum, such as identification and assessment of potential natural hazards a school may be exposed to and other everyday threats within their school.
- Schools need to collaborate with relevant stakeholders (e.g. local health officials, Civil Defence and Red Cross) with the aim of supplementing DRR messages such as 'drop cover and hold' and options for children with diverse disabilities, for example those using wheelchairs, and those with visual or hearing impairments.

3. Involve children with disabilities in DRR planning using participatory tools, and explore the need to further increase avenues for including their 'voice' among multi-stakeholder's forums.
    - Schools can foster continued involvement in DRR plans simulation/drills through targeted and effective participatory tools (e.g. maps) to help children feel included, and crucially inform DRR. Children with support can create individualized disaster plans, developed within the school context. The approach should involve teachers as an essential bridge to inclusiveness in school DRR.

6.6 Challenges to Disability-inclusive DRR in Schools

The research identified three interrelated challenges towards inclusive-DRR practices in schools working with children's disabilities from the workshop activities, observation and semi-structured interviews. These are those associated with: (1) Challenges associated with disabilities that affect resource access, (2) Limited resources (3) Policy limitations affecting implementation of DRR initiatives. These themes are consistent with previous research among people with disabilities (CBM, 2013; Handicap International, 2014; Kailes and Enders, 2007; Peek and Stough, 2010; UNESCO, 2013).

6.7 Challenges associated with disabilities

Some children may have multiple and diverse impairments or experiences that intersect with diverse contextual situations and societal attitudes. These place them at varying degrees of vulnerability or marginalization (Pearce, 2012; Peek and Stough, 2010). This means that the children lack access to DRR resources, thus complicating disability-inclusive DRR efforts. For example, children particularly those using wheelchairs, have challenges when required to evacuate the building swiftly; others struggle to get under a desk or table as per the recommended 'drop cover and hold'. Children with autism reportedly struggled to cope with 'excessive noise' from a siren/alarm or a bell going continuously during simulations. A possible intervention would be the use of combination of a siren, flashing lights, and earmuffs for some children as it was used in the Hawkes Bay School. Others were unable to follow instructions, and required prompts and adult or buddy support. Hence, it proves that disability-inclusive DRR efforts are complex particularly when considering children with diverse disabilities.

6.8 Resource availability and access limitations

Most families caring for children with disabilities are also poor (Alexander et al., 2012). As an example, the location of two case study schools in areas of limited resources and one of them situated at a tsunami evacuation zone mirrors this resource limitation. A local civil defence official also admitted having resource and staffing constraints to support children with disabilities. During an interview, a clinical doctor who works with the children bluntly stated:

> *I mean, children with disabilities and their families are not very well supported, full stop. (...) Then you add the extra complication of a disaster. I doubt they will get a lot more help than that* (Health official, Auckland).

> *Our welfare centres, though big, were not suited for people who might have mobility issues. During the 2011 earthquake, a welfare centre turned away a person in a wheelchair because there were no provisions for people with disabilities* (Red Cross official, Christchurch).

In addition, lack of access to adequate resources and information was evident in children’s perception. Some teachers noted the misunderstanding of earthquake messages, such as “drop cover and hold”, where ‘drop’ might literally imply ‘fall’. Interestingly, some students suggested words such as ‘get’ or ‘hide’ under a desk and ‘hold the side of the desk’ to avoiding the confusing word ‘drop’. Hence, adult participants wanted accessible resource provision and development of consensus-based DRR messages that are tangible or easily processed by children with disabilities and others.

6.9 DRR Policy constraints

These policies aimed at guiding the implementation of inclusive DRR plans. There are challenges associated with existing DRR policies: either having gaps or overlaps in their implementation. For example, there is no single oversight authority or organization tasked with ensuring adherence to DRR initiatives and guidelines in schools. In addition, a Red Cross official interviewed noted the many competing programmes in schools. He identified first aid, disaster and fire and suggested a combined DRR package, which incorporates all these programmes, made compulsory and coordinated/overseen by a mandated organization or school Board of Trustees.

6.10 Concluding comment

Children with disabilities have diverse impairments, skills and capacities, which intersect with diverse contexts and societal attitudes. This results in varying degrees of vulnerability and marginalisation that require varied approaches to meet their needs (Pearce, 2012). This policy brief recommends an approach that aligns with the comprehensive school framework (UNESCO, 2013) and offers differing/scaled levels of DRR integration, depending on school resources, and provides tools for planning, implementation, and evaluation. Central to disability-inclusive DRR in schools are children with disabilities themselves and their capacities to participate, and ultimately a shift in attitude and power relations where children with disabilities contribute to DRR initiatives. DRR in schools should thus rely on continued sharing of knowledge and searching for consensus around identification of gaps and together design corrective initiatives (Gaillard and Mercer, 2013) that are disability-inclusive.

6.11 References

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Chapter 7: Conclusion

Introduction

The overall aim of this study is to assess the perceptions, experiences and needs of children with disabilities in a natural hazard or disaster. This chapter makes concluding comments in relation to policy and practice. It provides highlights of relevant literature on children, disabilities and disaster risk reduction (DRR), a reflection of research methods and key research findings. The chapter proceeds to discuss significant implications of the research findings to DRR policy and practices. Importantly, it concludes by recommending an integrated framework that incorporates flexible participatory tools, which provide avenues for children's involvement in initiatives that give a more accurate evidence base for informing improvements in DRR policy and practice. The framework opens up possibilities of a new collaborative approach to DRR, where children with disabilities work alongside teachers, parents and other stakeholders in disability-inclusive DRR in schools. Research limitations and opportunities for further research are also outlined.

7.2 Background and research context

As noted in the introductory chapter and in the publications and paper under review, the disproportionate effects of natural hazards and disasters on people is partly what first triggered this research. The second reason was the sparse research focused and directed on the experiences and needs of children with disabilities in disaster contexts. In this regard, the thesis acknowledges the existence of two research parallels, an increasing number of studies directed at the experiences of children on the one hand and adults with disabilities on the other (Peek and Stough, 2010) leaving a knowledge gap in between: the experiences of children with disabilities (Ronoh et al., 2015a). This lack of knowledge presses the need for research to assess and understand effective pathways for integrating the experiences and unique needs of children with disabilities (Mihaylov et al., 2004), to help shape inclusive DRR. Very little is known about the potential role children with disabilities can play in DRR efforts (Peek and Stough, 2010). This research therefore provides an evidence-based understanding of experiences and perceptions of children with disabilities when faced with natural and other hazards as a first step towards a more inclusive approach to DRR.

The rising number, scale and cost of disasters has led to increased global attention being given to ways to reduce the exposure and vulnerability of people and assets to natural hazards while enhancing the capacities that comprise knowledge, skills and resources, which people resort to in dealing with natural hazards and disasters (Cadag and Gaillard, 2014). Since the concept and aim of DRR is to substantially reduce disaster losses in lives and in people's social, economic and environmental assets (UNISDR, 2009), the major challenge for practitioners is developing inclusive DRR strategies that specifically consider the needs of groups considered potentially vulnerable.

Most researchers recognizse that disasters tend to affect those who are marginalised geographically and who live in hazard-prone areas, socially, because they are poor and/or marginalised, and politically due to a lack of voice (Anderson, 2005; Gaillard et al., 2007; Tierney, 2012; Wisner et al., 2012). Often, they are overlooked in DRR planning. Subsequently, disaster literature identifies children, the elderly, women, racial and ethnic minorities, the poor, persons with disabilities and immigrants as especially vulnerable to disaster effects (Kailes and Enders, 2007; Philips et al., 2010; Wisner et al., 2004; Ronoh et al., 2015a). This thesis raises two issues in relation to children with disabilities when faced with a disaster: (1) the disproportionate effects of disaster on children with disabilities, who are potentially a vulnerable group in facing natural hazards; and (2) the diverse needs and capacities of children with disabilities that are insufficiently integrated in DRR efforts.

The literature review in Chapter 2 ties together important interrelated concepts of vulnerability, capacity and disability in relation to access to resources and DRR. The associated discussion emphasises the key concepts of 'vulnerability' and 'capacity' that require due consideration to achieve inclusive DRR. Hence, throughout this thesis these concepts and associated issues are highlighted as playing a central role in either the facilitation or inhibition of access to resources (Ronoh et al., 2015a) and how it relates to their everyday life (Kelman and Stough, 2015; Tierney, 2014). In this study, everyday life experience is used to refer to children's school experiences, but also their role in the wider society. Their experiences are largely influenced by their status (Anderson, 2005), and the associated skewed power relations between children and adults, which determines how vulnerability and disaster risk is manifested (Sparf, 2016). Overall, either at home or in school, children with disabilities rely on adults for material and financial resources and personal care, which are often inadequate. The study identified that children with disabilities broadly encounter many structural barriers and risks ranging from general access challenges to day-to-day resources, learning and play areas (inability to move around safely), manifested due to inappropriate or inadequate resources and support.

Parents, teachers and other stakeholders interviewed highlighted the limited educational and financial resources the schools, families and children receive. For example, the Auckland school is located in a tsunami evacuation zone, has poor building design, small sized classrooms, large glass windows and lacks a clearly designated evacuation point, signalling the schools' other pressing concerns (Ronoh, 2017) which take precedence, rendering DRR efforts secondary. In a disaster context, these resources may include agreeing on warning signals for potential hazards and associated protective actions, planning evacuation routes and meeting points, identifying vehicles and shelters, and preparing emergency kits and resources to cope with the disruption of daily life (Wisner et al., 2012). It also encompasses the opportunities to participate in activities that extend to the school community level, which help strengthen children's capacities and strategies for facing the occurrence of natural and other hazards.

Vulnerability to disaster risk is often a result of being deprived of access to resources available to others. Peek and Stough (2010) state that vulnerability to disaster risk may result from marginalisation, neglect, existing disabilities, and, particularly, lack of voice in DRR efforts. This thesis supports the notion that the root causes of vulnerability arise from social structures that can be traced historically to explain the ideological and cultural assumptions that give those structures their perceived legitimacy (Wisner et al., 2012). These structures determine both the availability of and access to resources, and DRR initiatives. Consequently, the lack of access to vital day-to-day resources—natural, social, economic, physical and human—often undermines the required capacity to face a disaster, and for coping and recovering in its aftermath (Wisner et al., 2012).

In addition, the poor articulation and conceptualisation of the term 'disability' plays a big part in the exclusion of children with disabilities from participation in DRR initiatives (Kelman and Stough, 2015; Ronoh et al., 2015a). The medical model (Priestly, 1998) views disability as a natural consequence of impairment and requiring medical help, thus ignoring societal structures and barriers (Priestley and Hemmingway, 2007). The social model proponents, on the other hand, explicitly argue that disability is caused by barriers erected by a disabling society through collective thinking and actions as opposed to impairment (Thomas, 2004). To help overcome this challenge, a framework for the assessment of vulnerabilities and capacities (Twiggs, 2011) is necessary to be able to identify the resources and support an individual may need in the face of disaster. Vulnerability is viewed as a consequence of limited or no access to resources, where poor and unstable access to DRR and a lack of voice results in marginalisation in facing natural hazards (Wisner et al., 2004). I address these challenges by presenting a disability inclusive framework to DRR in schools (Figure 7.1).

This thesis and the proposed disability inclusive framework (Figure 7.1) associated discussion in section 7.5 acknowledges that DRR initiatives should take the social model orientation that specifically provides more equitable and practical alternatives to exclusion (Peiffer, 2001; Kailes and Enders, 2007) to enhance the integration and involvement of people with disabilities. The emphasis here is that capacity should encompass the ability for children with disabilities to either use or access the required DRR resources (Wisner et al., 2012) and thus go beyond their sole availability.

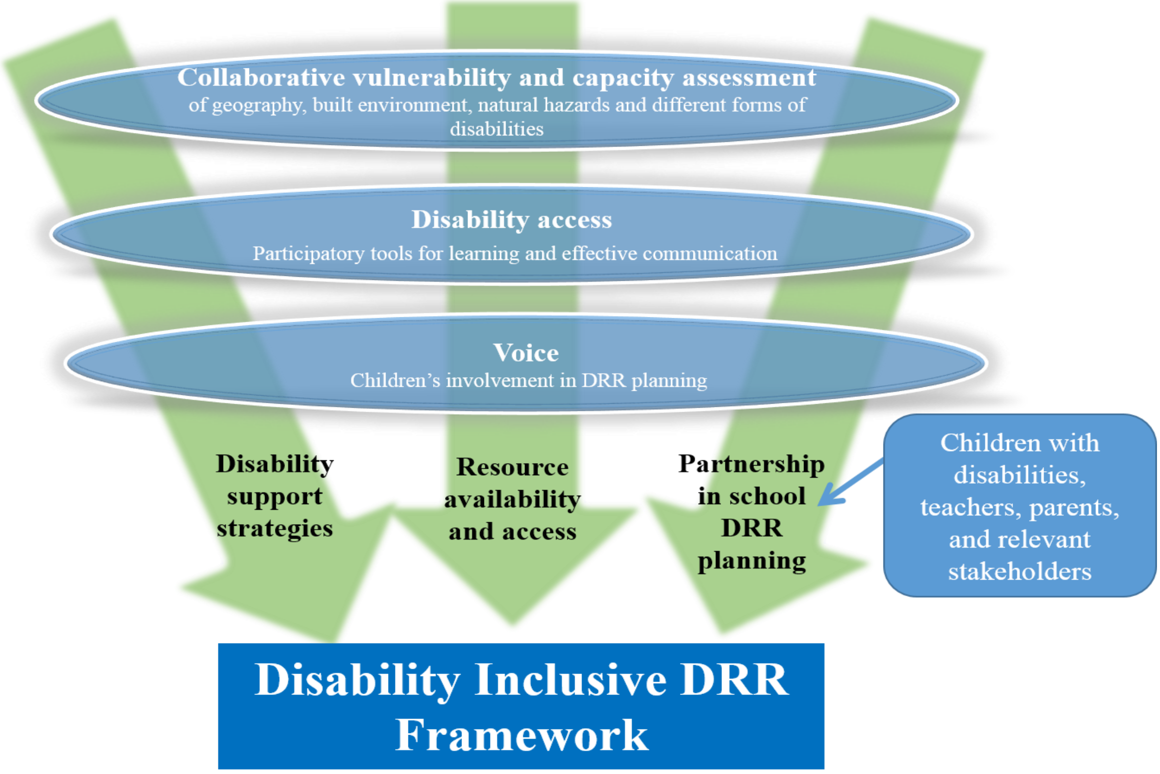

Figure 7.1: Disability inclusive DRR Framework

The framework recognises the need for researchers and policy-makers to understand how children with disabilities access and use resources, their perception, skills and strategies they adopt in facing natural and other hazards, and to identify when and how to provide effective disability support (Smith et al., 2012; Ronoh et al., 2015a) in DRR efforts. Hence, the requirement for an understanding of appropriate disability support strategies and identification of children's potential role in school DRR planning. The research approach and methods used were specifically aimed at addressing these knowledge gaps.

7.3 Methodological approach

This section provides a reflection of the innovative research approach, methods, participatory tools, and results. Each of the four papers and the Policy Brief presented in Chapters 3 to 6 provide a description of the research process and the findings in relation to the research objectives. The regions of Canterbury, Auckland and Hawke's Bay formed three case study regions, each being represented by a school working with children with disabilities. The case study approach was appropriate for the study for two key reasons.

First, the approach enabled a study of three regions that reflect differing geographical locations (Figure 7.1) and experiences of past natural hazards and disasters. These are: 1. The Christchurch case study, that took place more than three years after the Canterbury earthquakes (magnitude 7.1) of 2010 and (magnitude 6.3) of 2011. The February 2011 (Magnitude 6.3) earthquake devastated the city and 185 people lost their lives (Gibbs et al., 2013). 2. The Hawke's Bay region experienced the 1931 earthquake (magnitude 7.8) that caused damage to housing, buildings and infrastructure and the death of 256 people across the whole region (Hill and Gaillard, 2013). Many more storm and flooding events have affected the region since then. 3. The Auckland region, on the other hand, has not experienced a major disaster event in the recent past, although volcanic eruptions, tropical cyclones, floods and tsunamis are potential natural hazards (Newham et al., 1999) for the region.

The second strength of the case study approach rests in its power of attention to the local situation (Baxter and Jack, 2008). This is central when research is meant to address both descriptive questions (e.g. what is happening) and explanatory questions (how and why something is happening) (Yin, 2014) thus providing meanings others have about the world (Creswell, 2013; Thomson and Philo, 2004).

The research used four data-gathering techniques that involved three participatory tools used as part of workshops: semi-structured interviews, participant observation, and a review of school safety documents. The participatory tools: proportional piling for ranking natural hazards, mapping of safe and unsafe school spaces, and cut and paste survival kit categorisation activities were carried out in a workshop style approach, which meant children with diverse disabilities were engaged. In turn, the range of data collection tools enabled information to be directly drawn from children with disabilities, which has rarely been reported in the literature (Peek and Stough, 2010; Boggis, 2011). The study is thus uniquely anchored on flexible participatory tools and offers several advantages. Participatory tools help to engage children with disabilities as research participants, as well as help with data-gathering and analysis. Often, the ‘voices’ of children with disabilities have been excluded or ignored in research as they are considered incompetent, or because they pose a challenge to traditional research methods (Boggis, 2011). However, as Stone (2001) argues, given appropriate tools and support, all children, including those labelled as having “severe disabilities”, are able to express their views and feelings. With these flexible tools, this research adapted the means of communication, rather than expecting children with disabilities to change the ways they express themselves (Booth and Booth, 1996; Willow, 1997).

The methods used in this study spring from the basic premise that children with disabilities have some views and perspectives to communicate, and experiences worth understanding (Nind, 2008) about natural hazards. Such a premise requires commitment, serious attention and creativity to multiple methods among a heterogeneous and diverse group of participants. The schools provided an array of challenges the participants often encounter. Most of the participants were described by the schools as having visual and hearing impairments, difficulty with comprehension, memory, communication, relating to others, and anxiety at changes in routines, having mobility issues, and obsessive-compulsive tendencies. The heterogeneous nature of the participants meant every effort was made to ensure the approaches used accommodate their varied means of communication. To minimise movement particularly those children with mobility difficulties, the research activities were carried out on the classroom floor, which also helped limit eye contact and to attenuate power relations amongst the group.

To engage those participants who have difficulty with comprehension, memory and communication, the use of a proportional piling activity and a tactile map of their school helped provide a combined visual and kinaesthetic spatial experience. These experiences rendered the concepts more tangible or concrete for the children. The survival kit items activity and associated pictures importantly acted as a catalyst to stimulate children's memory (Nind, 2009). These activities helped sustain children's interest: they were easy and simple for all participants, and required limited oral and literacy skills for those with difficulties in expressing their views. However, some children were inarticulate either because of low self-esteem or anxiety, while others remained largely unresponsive. This may have been a result of cognitive and learning difficulties. However, with teacher support, attention was directed to their facial expressions such as pointing and nodding, and general body language (Booth and Booth, 1996) to enable communication.

Notably, the impact of this approach contrasts with other research methods, such as questionnaires, particularly when used with such a group. In comparison, participatory tools facilitate the accommodation of children's diverse abilities, competencies and interests, while increasing trust, bridging the often skewed power relations between adult and child participants, and enabling their sustained engagement. Accordingly, the proposed disability inclusive framework (Figure 7.1) acknowledges that children with disabilities communicate and participate through means other than speech. The framework incorporates participatory tools and provides for a collaborative assessment of vulnerabilities and capacities within the school context. Subsequently, the result can offer a deeper insight into participant's lived experiences and potential capacities. In the study, three key factors contributed to children gaining increased confidence during the research. These included: receiving appropriate disability support; a feeling that their contribution was valued; and that they were given a voice and opportunity to participate as provided by the proposed disability inclusive framework.

In addition to the use of participatory tools, participant observation and semi-structured interviews offered another lens to triangulate the evidence, increase its reliability and serve to corroborate the data gathered from other sources (Baxter and Jack, 2008; Creswell, 2013; Yin, 2014). The following section presents the key findings based on research objectives analysed and discussed in relation to available literature (Creswell, 2013) on children, disabilities and disaster.

7.4 Key research findings

Research findings from this study provide a deeper understanding of the children's experiences and perceptions of natural hazards, and have potential implications for DRR and disaster research particularly with children having diverse disabilities. These findings are separately discussed in relation to the four main research objectives.

1: To explore awareness, understanding and experiences of disasters by children with disabilities.

The findings highlight an existing variation, from levels of hazard awareness and understanding to disaster preparedness strategies, thus signalling the inherent complexity in promoting DRR initiatives among children with disabilities. Results presented in Chapters 4-6 indicate that the children's awareness and understanding of potential hazards and associated protective actions in Christchurch and Hawke's Bay schools were generally good and hence they have a potential capacity to face natural hazards. In the proportional piling activity, for instance, participants placed an earthquake at the top of the rank, which was in line with the New Zealand Ministry of Civil Defence and Emergency Management (MCDEM) lists on its website (www.civildefence.govt.nz) of the natural hazards (Table 1) in each of the case study areas. However, the findings identify that tsunami hazard awareness, which ranks high among the MCDEM officials in Auckland and Hawke's Bay, is also a potential hazard in Christchurch (Hart and Knight, 2009), but is poorly appreciated by the participants. Such gaps may be a reflection of an ineffective design and delivery of targeted DRR messages to the children. Interestingly, teachers attributed children's perceptions to their familiarity with water (e.g. enjoyable swimming sessions), and thus rarely associating it with disaster: a perception that may again be related to how tsunami information has been designed, delivered and accessed by the children (Ronoh et al., 2016a).

A notable similarity emerged when linking natural hazards in these geographical regions to potential effects and associated protective actions, where there was consistency among all participants. For example, participants linked 'volcanoes' to 'lava', 'flooding' to 'drowning', and 'tornado' to 'violent wind'. The same consistency also applied to participants' understanding of associated protective actions in the face of a hazard (an earthquake) which was ranked top in all the three regions. The results showed children's understanding of the need to evacuate to higher ground when it floods, or in the case of a tsunami hazard. The findings from the survival kit items activity had similarities with research by a questionnaire survey by Finnis et al. (2004) in a mainstream school with children aged between 10 and 12. Both studies report children placing high importance on torches, first aid kits, radios, and spare batteries in an earthquake (Ronoh et al., 2015b).

Another significant observation during mapping activities was the perception among some participants that places of play, or those which are associated with enjoyable experiences, such as a playground even with swings also are safe. It further mirrors a varied understanding of potential hazards especially where disasters harm the physical spaces where the children learn and play, yet they are rarely involved in the process of rebuilding the spaces. This is partly due to the diverse ways in which disability is conceptualised, and the children's depiction as "helpless" in disaster (Hahn, 1985; Aron and Loprest, 2012). Woodhouse (2004) attributes such a perception to a cultural construction of incompetence and dependence that blurs the children's potential capacities. On the contrary, the study reveals that children with disabilities portray some capacity for self-protection and group action. Children possess the capacity to resist, avoid, adapt, and recover from the effects of natural hazards and disaster, and importantly, with appropriate support, use their abilities to contribute to DRR planning and practice (Wisner et al., 2012).

However, the downside is that the physical environment and most spaces often possess inherent adult designs and values, and are restrictive to children with disabilities. Instead, they find themselves unable to effectively integrate in the broader school community (James and Prout, 1990; Thompson and Philo, 2010) due to the built environment and other social barriers. Indeed, the same physical environment has historically been influenced by the characteristics or needs of persons without disabilities (King et al., 2003). That is why, even though aspects of the environment, including architecture, communications, and other settings, offer a context for social interaction; they are fundamentally moulded by public policy that fails to consider disability in its remit (Watson et al., 2012). This thesis thus calls for enhanced partnership in developing DRR initiatives that help prioritise children's needs through a direct and sustained engagement (Priestly and Hemmingway, 2008). Such initiatives should involve adults and children developing new skills, and requires investment of resources. Often children's involvement requires a major shift in attitude within schools and other organisations, and in power relations where children are portrayed as passive 'victims' in a disaster, which advances the ‘children at risk’ discourse (Gibbs et al., 2013). The study, however ,argues that, although involving children in the DRR decision-making process may take time and slow down the process, given appropriate support with effective participatory tools, they have a variety of ways of contributing to DRR. The proposed inclusive framework emphasises giving children the appropriate disability supports to ensure access to resources, as key to their participation as stakeholders in school DRR planning.

2: To identify factors that make children with disabilities potentially more vulnerable in facing natural hazards.

This research identifies two interrelated challenges towards inclusive-DRR practices in schools working with children’s disabilities, which is consistent with other research (see CBM, 2013; Handicap International, 2014; Kailes and Enders, 2007; Peek and Stough, 2010; UNESCO, 2013). These are: (1) Challenges associated with disabilities; and (2) Complexity of access to DRR resources. These challenges and associated policy limitations affect the implementation of inclusive DRR initiatives.

7.4.1 Challenges associated with disabilities

Children with disabilities, particularly those with mobility impairments, experience challenges when required to evacuate the building swiftly, and some struggle to get under a desk or table as per the recommended ‘drop cover and hold’. Children with learning disabilities may not recognise disaster risk and warning signs quickly or readily (Kailes and Enders, 2007). In the study, some participants were unable to follow disaster drill instructions, while others developed increased anxiety, and required prompts and adult or buddy support. A parent singled out the frustrations caused to her child by participating in preconceived and rigid disaster drills that did not accommodate various forms of disability. For those children with sensory impairments, such as hearing and speech, apart from not receiving timely warning messages, they encounter significant barriers during disaster drills and evacuation. Children with visual impairments require continued buddy support to get around learning, playing and other school spaces. Similar support is expected when participating in a disaster drill and critically, such support from peers is vital in a disaster situation. However, most of the recommended DRR actions often exclude children with disabilities and thus contribute to their further marginalisation. Thus in a disaster situation, disability is magnified through the interaction between the existing physical or sensory impairment of the child (Peek and Stough, 2010).

Children with autism reportedly struggled to cope with ‘excessive noise’ from a siren/alarm or a bell ringing continuously during simulation drills. Children with autism-spectrum disorders have sensory integration problems that may include high sensitivity to light, sounds, odours, tastes, and touch (Boon et al., 2011). In effect, this sensitivity compounds disaster drills/recommended procedures, and can make them particularly vulnerable during disasters. The high noise level issue, for example, saw some children withdraw from undertaking important school disaster drills. Some parents were critical of the use of both the loud siren and loud audio instructions on the well-being of the children, particularly those on the autistic spectrum, highlighting the complexities of doing DRR and associated initiatives. However, due to limited empirical studies and wider power relations within the society, DRR recommendations and initiatives precede systematic research on the experiences of children with diverse disabilities, and are often based on ‘expert’ opinion, rather than empirical research (Kelman and Stough, 2015; Stough, 2015). An assumption often made by professionals is that adults (parents or teachers) will inform, warn and protect these children (Peek and Stough, 2010), even though they are frequently apart from adults when with peers. Subsequently, DRR recommendations fail to adequately provide targeted or inclusive approaches that consider the needs of the children by requiring children to work alongside adults. They are instead left without voice, vulnerable to disaster risk and further marginalisation.

7.4.2 Complexity of resource access

Another potential factor for the vulnerability of children with disabilities is the complexity surrounding access to DRR and other day-to-day resources. School DRR initiatives and resources often target teachers and other adults with the assumption that adults make responsible and appropriate decisions and choices about hazards the children may face (Peek, 2008). Lack of direct access to adequate DRR resources and information may present itself in children’s perception. Teachers reported a hidden misunderstanding of earthquake messages among children with disabilities, such as ‘drop cover and hold’, where for some children, ‘drop’ might literally imply ‘fall’. Some of the children’s preferred words are ‘get’ or ‘hide’ under a desk and ‘hold the side of the desk’, avoiding the potentially confusing word ‘drop’. However, children with disabilities are often overlooked or discriminated against during DRR initiatives which are often designed for people who can walk, run, see, drive, hear, speak, quickly understand, and respond to instructions and alerts (Kailes and Enders, 2007), leaving them marginalised and unprepared when facing a hazard. The challenge is how to strengthen the structural will to address the implication of DRR for children with disabilities who have been rendered largely invisible and left without a political voice by an ‘ableist’ society (Ronoh et al., 2015b). It is therefore important for DRR practitioners to first identify and recognise capacities specific to children with disabilities to offer them roles to play in DRR. To realise success in these roles, power relationship challenges need to be addressed, by encouraging a collaborative approach to vulnerability and capacity assessment in school.

These findings also necessitate more accessible DRR resource provision and development of consensus-based DRR messages (UNESCO, 2013) that are tangible or easily processed by children with disabilities and others. Most school disaster plans, for example, are generic ‘one size fits all’ guides (Fox and Rooney, 2007; Barnes, 2013). While all three schools had similar disaster evacuation guidelines provided by CDEM, no consideration was given to the heterogeneity and the wide array of vulnerabilities and capacities. Again this is a demonstration of challenges associated with Civil Defence top-down DRR communication of information and potential exploitation of power relations. Hence, in practice, policy and planning continues to remain at ‘helping the disabled’ persons to adjust and accept the existing environment, rather than altering the environment and providing support structures and resources to accommodate the needs of children with disabilities (Hahn, 1985). Most adult participants interviewed also pointed out the limited financial resources available to schools and families working with children with disabilities. Other researchers hold similar views (AIHW, 2009; Peek and Stough, 2010; Alexander et al., 2012; Johnston, 2015). They emphasise that the financial burden of caring for children with disabilities is carried by families and schools, as they are often associated with social, structural, and financial disadvantages and low incomes.

3: To assess children with disabilities’ actual contribution and opportunities available for promoting DRR among the children and their carers in New Zealand.

The research demonstrated that children’s knowledge and understanding of natural hazards allows them to feel in control, and, in Christchurch, for example, allowed children to take protective actions before, during and after a disaster event. In schools, disaster preparedness programmes can become beneficial if the child understands potential natural hazards and associated safety strategies to apply in the face of disaster (Ronan and Johnston, 2005). Discussions of disaster risks, vulnerabilities, available resources, and preparedness activities are associated with increased capacity if the child is left alone or in a collective capacity if the child can help and influence others. The findings from the Hawke's Bay school also demonstrate that children's involvement in DRR initiatives help enhance their individual and collective capacity in facing disaster (Paton, 2003). The use of participatory tools by the children in ranking potential natural hazards and mapping activities enabled effective communication among students, and between the student and adult participants, where children identified spaces perceived as safe and unsafe in their school. Follow-up presentations to parents and other workshops by the children helped raise natural hazard awareness in the school community.

Children are also resourceful in terms of creativity and enthusiasm, as was evident from workshop observations and in participating in preparedness activities and disaster drills. They undertook disaster simulation drills, class discussions on disaster preparedness and associated protective actions. While some adult participants were surprised at how their children were able to hold and express views/varied perspectives pertaining to DRR initiatives, others interviewed credit their children's influence in re-evaluating emergency kit items, and simulating 'drop, cover and hold' at home, thus passing on what they had learned at school to the home environment. Some parents in Christchurch shared how their children modelled earthquake scenarios in their gardens to help gain understanding, control and cope with potential natural hazards.

Other DRR activities, such as simulations and repetition of disaster and safety drills and practices, have been found to translate understanding into useful disaster preparedness strategies (Ronan and Johnston, 2005; King and Tarrant, 2013) and potentially get them through a disaster. Children's increased capacity, resourcefulness and having a role to play in DRR helps to provide them with the necessary voice and potentially the ability to influence family members and friends as valuable disaster risk communicators. For example, the Hawke's Bay school participants took ownership of and proudly presented their mapping of the school's safe and unsafe spaces to a parents' meeting. Children's increasing confidence and understanding of natural hazard risk was noticeable when the participants later represented their school in a 'disaster' workshop for children with disabilities organised by the local Hawke's Bay CDEM, also attended by people with disabilities who had experienced the

February 2011 Christchurch earthquake. Through the schools ‘buddy’ and peer support system, the children became instrumental in identifying natural hazards and awareness of protective actions among peers, parents and the school community. Children who receive information about hazard risks can then share their knowledge with their families and school communities (Wisner, 2006), and ultimately prompt positive change and realistic risk perceptions (Peek, 2008).

The study also revealed two key roles the school itself played in inclusive DRR efforts. The first is the significance of the school location and accessible building designs as a resource for children with diverse disabilities and as a school community shelter during a natural hazard. Aspects of access include the provision of opportunities and spaces where children can take leadership responsibilities and thus promote inclusiveness in the DRR decision-making process. Those who played leadership roles were observable through the child-centred workshop activities of mapping, proportional piling and survival kit items used, which enabled children the options of working individually with adult support, in pairs, or in groups, applying teamwork among themselves. Ultimately, schools offer spaces and a platform where children and adults (teachers, parents and others stakeholders) can work together. Subsequently, participation that involves adults in school DRR activities provides children with the challenge to not only devise local school solutions, but with appropriate support, to recognise and seek external support where necessary.

Second, the findings identified disability-inclusive strategies: age and ability-appropriate techniques, used by teachers to be effective in facilitating DRR-related learning in schools. Teachers are an essential bridge to inclusive DRR; they are an accessible and trusted source of support and information through application of age and ability-appropriate approaches (Johnson and Ronan, 2014). Among the findings, for example, is that all three schools use drawing and mapping skills in their daily classes to help children conceptualise new or often abstract concepts such as hazards, risk capacity and vulnerability. In the Hawke’s Bay school, teachers use mapping techniques as a visual learning tool for orientation purposes within the school. This is also a potentially useful skill for finding direction in times of natural hazards or disaster evacuation drills. Other valuable activities the children may participate in could include identifying evacuation routes and equipment, potential hazards, alert and communication methods, and becoming trained assistants for individuals with disabilities. The benefit of developing inclusive DRR initiatives in a school environment is that schools have been found to encourage participation by promoting caring relationships, effective buddy systems among peers, and welcoming attitudes (Law et al., 2007; Mutch, 2014).

4: To identify effective strategies, and avenues already in place in promoting DRR among children with disabilities.

The study acknowledges the effectiveness of schools as strategic entry-points and avenues for DRR initiatives and research that consider children's views and perspectives in the DRR agenda (Wisner, 2006). Research findings provide examples of schools' effectiveness in providing avenues where children can undertake DRR initiatives and other school-based hazard education programmes, and in sharing their understanding within the school community. Such collaborative efforts help increase accurate knowledge of hazards and the required risk reduction strategies. They also equip them with problem-solving opportunities and other DRR initiatives to enable passing on what they had learned at school in the home environment (Johnston et al., 2014). In addition, since a child is often 'embedded' within the family, school, and school community, the relationships means that school DRR initiatives may be continuously re-affirmed (Mitchell et al., 2008). The question for schools is how children's role can be further encouraged to promote inclusiveness in the DRR decision-making process.

For example, what stood out during observation of research activities was the effectiveness of a disaster evacuation drill activity, where the class exiting routine of lining up at an agreed safe spot and walking out in a single file made it easier to evacuate the room. If children were to be involved in planning these activities, such routines and disaster drills would enable them to apply knowledge of protective actions and strengthen their individual and group capacities more effectively. Teachers recommend several improvements, such as having a disaster plan in place, practicing drills in more than one location, ensuring survival kit contents last several days, and putting plans in place. Other suggestions provided by teachers include developing an inclusive school plan to swiftly normalise routines following a disaster, such as having books to read, singing songs and doing hand games. These recommendations can be accommodated within the proposed disability inclusive framework (Figure 7.1), thus underscoring inclusivity and a collaboration among relevant stakeholders in school DRR.

7.5 Implications for policy and practice

This study provides new knowledge in some key interrelated aspects that touch on inclusive DRR policy and practice as detailed below. The following section (7.5.1) discusses a potential way forward to disability inclusive DRR in schools, while section (7.5.2) focuses specifically on suggestions to enhance partnership in school DRR planning.

7.5.1 Enhancing DRR inclusivity in schools

This thesis acknowledges the central role access to DRR and day-to-day resources play in determining the capacity of children with disabilities and their potential role in DRR. The study argues that for children with disabilities, access to resources requires effective disability support strategies to facilitate their contribution in school DRR planning. Resource availability should thus encompass the ability to either use or access the resources needed (Wisner et al., 2012). Those often marginalised should be granted access to resources and means of protection in facing natural hazards, and they particularly require consistent support from the government, anchored in everyday life (Gillard and Mercer, 2013). Wisner et al. (2012) have argued that availability of resources is influenced by longstanding systems of social, economic and political power and ‘voice’ to either provide resources and options, or constrain lives and livelihoods. In particular, the study points out that due to the status of children in society and the associated skewed power relations between adults, children with disabilities have no ‘voice’ or political power. Their views, perspectives and capacities are often overlooked or excluded in the DRR process: research, policy and practice. They are subsequently left unprepared when a disaster strikes.

This thesis therefore urges the consideration of a wide array of vulnerabilities alongside capacities of children with disabilities and a deliberate shift in attitude in school DRR in line with the comprehensive school safety framework (UNESCO, 2013). Specifically, the school safety framework advances three pillars of safe schools: safe learning facilities, school disaster management, and risk reduction and resilience. The emphasis for this research is placed on what children with disabilities can do for themselves and with others, and how they can strengthen their capacities in the context of identified disaster risk (Twigg, 2007), through provision of appropriate disability support strategies and strengthened partnership in school DRR planning among key stakeholders. The approach converges with the ‘children’s potential capacity' narrative (Haynes and Tanner, 2013), which involves building the capacity of children with diverse disabilities in DRR planning and initiatives. Otherwise, DRR approaches and recommendations based purely on expert opinion without due consideration to the perceptions of children with disabilities, vulnerabilities and capacities ignore their valuable resource of DRR planning (Anderson, 2005).

The research findings presented in Chapters 4-6 identify several intrinsic capacities which are endogenous to children with disabilities. Capacities are a set of knowledge, skills and resources that people resort to when dealing with natural hazards and disaster (Cadag and Gaillard, 2014). For example, Chapters 4-6 presented examples of children's knowledge and understanding of natural hazards and associated protective actions: their perceptions of space (safe and unsafe), and their creativity and enthusiasm in sharing their skills to enhance individual and group action (Ronoh et al., 2015). Children's knowledge and skills are notably extended to family members and the school community by sharing what they had learned. These findings also converge with a review of the daily experiences of children with disabilities by Heah et al. (2007) which highlighted children's potential capacities during disaster, both individual and collective. Even when directly affected by the disaster, especially with appropriate disability support from parents/caregivers and when living in a safe and nurturing environment, children can and often do cope effectively with disruptive shocks (Peek and Stough, 2010).

This study recognises the need for partnership in school DRR planning, since local events and hazards affect the school community most, where members, the children, school staff and stakeholders become first responders. However, from this research, two key issues stand in the way of successful disability-inclusive DRR among children: the status of children in the society and associated skewed power relations (between adults and children), and the absence of flexible participatory tools that allow two-way communication among participants, as discussed in the next section. This thesis acknowledges that disability inclusive DRR requires a major shift in attitude within organisations and in managing associated power relations, viewing children as having capacities and providing them with roles to play in school DRR planning (Haynes and Tanner, 2013; Franklin and Sloper, 2009).

The complex and bureaucratic nature of school procedures and processes, often "one size fits all" guidelines or even family's self-interest in its autonomy and privacy, were seen to limit the participation of children with disability. This may happen while they are being protected from disaster risks or being denied an opportunity to participate in DRR initiatives (Park et al., 2001). From the research, gaps were identified in relation to children's lack of understanding of a tsunami hazard, the association of places of play with safety, or the confusion caused to some students by the disaster simulation drill of 'drop, cover and hold'. Questions should then be asked whether DRR initiatives and policies reflect only adult expectation without regard to the viewpoints or voice of children with disabilities. These gaps necessitate a shift in approach to DRR initiatives from the sole reliance of adult or 'expert' opinion to providing opportunities for the children's voice in messaging. It matters to involve children, obtain their perceptions and views of safe and unsafe spaces (or key DRR messages) which may be different from adults' (Garth and Aroni, 2003). In addition, treating children with disabilities differently produces pity, patronising behaviour and negative stereotypes in other people and creates a perception of a 'protected class', a practice which destroys all vestiges of equality (Pfeiffer, 2001). Similarly, Kett et al. (2005) report upon a reflection of the 2004 Indian Ocean tsunami that observed, while many international organisations had inclusive DRR policies prior to the tsunami, people with disabilities were not included in disaster planning or delivery. Clear policies and strategies, for example, existed regarding the requirement for accessible sanitation, but latrines constructed were still inaccessible (being several feet above the ground) (Kett et al., 2005).

Critics, however, argue that children with disabilities are slow and unable to make choices or make considered decisions, and therefore require their lives to be structured and controlled by adults (Watson et al., 2012). Such a perception of children's reliance on adults may be due to their invisible role or voice in DRR planning and other day to day activities. For instance, school teachers and caregivers often manage their day, personal care, administer medication and transfer them in and out of wheelchairs, depicting them as incompetent, dependent and in need of protection, which masks their actual capacities (Woodhouse, 2004). The implication of this perception is the often erroneous justification to use proxies as children's representatives (Mahon et al., 1996) or not including them in DRR planning where professionals make recommendations deemed appropriate for the children. A paternalistic approach of excluding children from DRR research and other initiatives (Mitchell et al., 2008), or creating an environment that is overly safe, threatens their safety when a disaster strikes. Significantly, the fact that some DRR initiatives result in lack of understanding and confusion in the children calls for their involvement in planning and decision-making, to help eliminate or reduce such challenges. It again necessitates the need to go beyond disaster drills to enable them to understand the reasons behind the recommended protective measures (Ronan and Johnston, 2005) and participate in the school DRR planning process. However, it should be acknowledged that involving children with disabilities in research and the decision-making process is intricate and time-consuming. It involves adults and children developing new skills or tools, and thus requires investment of disability support strategies and resources. Often it entails a major shift in attitude within schools, the society and in power relations in favour of the 'children's potential capacity' narrative (Haynes and Tanner, 2013).

Chapters 4-6 detail the existing vulnerabilities and complexities in DRR planning among children with diverse disabilities. Chapter 6, on policy and practice, outlines two broad but interrelated constraints towards achieving inclusive DRR. The challenges are associated with the diverse disabilities that affect resource access, and general complexities of resource access. These findings are consistent with research among people with disabilities (Handicap International, 2014; Kailes and Enders, 2007; Peek and Stough, 2010; UNESCO, 2013). Following Smith et al., (2012), this thesis emphasises that it is not diverse disabilities but the lack of knowledge about disability that intrinsically contributes to the exclusion of people with disabilities from DRR activities. Their exclusion leaves them without a political voice and their views and perspectives are often ignored (Wisner et al., 2004; Anderson, 2005).

For example, most disaster policy and planning documents identify people with disabilities generally as members of 'vulnerable' or 'special needs' populations despite the existing heterogeneity of people with disabilities (Priestly and Hemmingway, 2008; Kailes and Enders, 2007). Similarly, the "helplessness narrative" is common with traditional approaches in social work, health and education when supporting children with disabilities (Watson and Shakespeare, 1998). Such approaches instead magnify their 'dependent' status, 'need for care' both in school and at home, emphasise their vulnerability and obscure their potential capacity. Consequently, these attitudinal factors and structural barriers remain potent challenges to their participation and contribute to further marginalisation. Significant for inclusive DRR planning, however, is that the research showed children's potential, in both individual and group capacities, and thus formed the basis of the thesis and its key argument for a shift in attitude aimed at enhancing endogenous capacities specifically for children with disabilities. Enhancing capacities for children ultimately requires an approach that bridges the existing gap, through resource access and engaging children in DRR initiatives, vital if children are to affect policies and processes shaping the development of inclusive DRR (Mitchell et al., 2008).

7.5.2. Strengthening partnership in school DRR

This thesis asserts that DRR should be inclusive, and challenges the notion that the children are passive participants in DRR. The main implication is the need to provide a platform where flexible participatory tools can be used to both accommodate and offer children with diverse abilities opportunities to learn and communicate issues that affect their lives (UNCRC, 1989; UNESCO, 2013). This platform should also be able to provide them with voice and accommodate their perceptions on disaster risks. Significantly, numerous explanations have been put forward for the lack of children's involvement in DRR, and, in particular, disability-inclusive DRR initiatives. Some researchers blame the lack of children's involvement on the absence of effective research tools/aids, while others cite children with profound disabilities, or cognitive and intellectual disabilities as unable to be in control at every, or any, stage of the project process (Franklin and Sloper, 2009).

However, the research attributes children's exclusion in DRR planning to lack of access to DRR resources (Ronoh et al., 2015a) as a result of their status in the society, and the problem associated with skewed power relations between adults and children. They are often viewed as requiring care and protection from adults, who in turn act as children's proxies, and structure their daily activities within the school or at home. That is why, even when children are known to have different experiences, usage and perceptions of space, their experiences and perspectives are usually explored through voices and perceptions of adult proxies (Skelton, 2009). Indeed, very little effort has been made to try alternative methods and tools where children can effectively communicate their views (Franklin and Sloper, 2009).

This study argues that children with disabilities have capacities and can play a potential role in school DRR. The thesis follows the recommendations from DRR practitioners, especially those working with NGOs, regarding the need for a holistic framework that increases the involvement of those affected by disaster in policy and action towards DRR. These proponents advocate for a recognition of the local people (Delica-Willison and Gaillard, 2012), including children with disabilities in DRR. They are not helpless in facing natural hazards, but instead their local knowledge and capacity (gained through experience) is a valuable resource (Mercer, 2012). Accordingly, in school DRR planning, there is the need to reconcile various forms of knowledge and actions from a wide array of stakeholders (children and adults) at several scales and in different directions (Gaillard and Mercer, 2013). Integrating knowledge, collaborative vulnerability and capacity assessment, and action in DRR among various stakeholders requires sharing of these forms of knowledge, from children with disabilities to all adult school stakeholders, addressing uneven power relationships, unfavourable institutional structures (Mercer, 2012) and methodological challenges.

Research findings support the argument for a DRR approach in schools to accommodate the needs and perceptions of children with diverse disabilities. For example, while some children with disabilities (autistic spectrum) were withdrawn during one of the school disaster drills (due to high noise levels), others who participated developed frustrations when following 'expert' set procedures without a clear understanding of the process. A study by Johnson et al. (2014) also reported that significant portions of the children had difficulty applying what they had practiced in the classroom-based disaster drills and it states:

> *"The uncertainty and deficiency in knowledge transfer among children in regards to appropriate responses (...) in school drills, as they are currently practiced, may not achieve the intended effect of reducing injuries and deaths among children during disasters"* (Johnson et al. 2014 pp. 264).

These authors advocate for cognitive components to the drills, such as classroom discussions around the rationale for the drills and protective actions, and, especially, developing scenario-based, problem-solving activities. They also suggest the need for an improved partnership and collaboration with other stakeholders to enhance school DRR planning. This thesis proposes a framework that places emphasis on access to resources by children with disabilities, through disability support strategies and enhanced partnership in school DRR as proposed in the disability inclusive framework (Figure 7.1), discussed below.

7.6 Disability Inclusive DRR Framework in Schools

This research proposes a framework that presents a potential opportunity to fundamentally bridge the participatory gap among children with disabilities, school staff and relevant stakeholders in DRR (Figure 7.1). The framework is aligned to the Comprehensive School Safety framework (UNESCO, 2013) to foster disability-inclusive DRR in schools. In particular, the framework presents three overlying factors to inclusive DRR in schools (Figure 7.1): (1) disability access and inclusive participatory tools, (2) opportunities for a collaborative approach among stakeholders and in taking collective action, and (3) according voice to children with disabilities in DRR planning. The next sections discuss these three factors. The first, disability access and participatory tools, is briefly presented as overlapping with the other two factors. Therefore, placing the children's voice in the final row is aimed at highlighting that their "voice" can be heard when the other two aspects have been considered and put in place.

7.6.1 Disability access and inclusive participatory tools

The use of inclusive participatory tools in school DRR played an overlapping role, both by facilitating and according children with disabilities with a voice, and by providing them with opportunities for a collaborative approach. With appropriate tools, these children contributed their views, their experiences and their perceptions of disaster risks, without their being required to change how they expressed themselves (Willow, 1997). In particular, the participatory tools enabled children who had speech and visual impairments as well as those with cognitive difficulties to make their views and perceptions known by using non-verbal methods of engagement options. At the same time, the use of a proportional piling and mapping activity provided a combined visual and kinaesthetic experience. Such an experience was significant in helping the participants to understand important but often abstract concepts, such as risk, hazards, capacity and vulnerability, and safe and unsafe spaces. As discussed in the next two sub-sections, an effective use of flexible tools can bridge the participatory gap; it can enable two-way communication between adults and children and give a voice to support children with disabilities' empowerment in DRR efforts.

7.6.2 Collaborative approach: Capacity and vulnerability assessment

Disasters often result from non-applications of existing laws and policies, whether for enforcing construction codes, school safety policies and from unequal distribution of resources within the society (Hewitt, 2007). They require collaboration among various stakeholders. This thesis recommends the establishment of a multi-stakeholder platform where both children and adults or/and relevant stakeholders can work together. There is a need to integrate children's understanding and various forms of knowledge with current disaster risk assessments.

However, most assessments have mainly relied on currently available technology such as using probabilistic models, radar, seismographs, GPS and remote sensing (Saito et al., 2013, Gaillard and Mercer, 2013). Even, the use of questionnaire-based GIS surveys to provide vulnerability and risk perception evaluation by social scientists is still complex for children with disabilities to discern. Notably, when a collaborative approach to vulnerability and capacity assessment is carried out within the school context, children become key stakeholders. Other stakeholders such as the Civil defence, and, to a limited extent, teachers provide expert opinion (Skelton, 2009, Boon et al., 2012) on DRR planning and dissemination of messages.

The study findings reveal that some of the children, parents and surprisingly, some teachers had insufficient knowledge of potential natural hazards in their region particularly that of a tsunami risk. An integrated framework (Figure 7.1) that offers partnership opportunities among stakeholders and incorporates participatory tools should provide a credible platform and opportunity for children, parents and teachers to access scientific resources in a simplified way. Through the framework, both children and adults make an analysis of different disabilities and associated vulnerability within the school context, as well as potential capacities in relation to available resources. An analysis of a wide array of vulnerabilities and children's capacities in DRR should also consider the potential natural hazards in each geographic or school location (Wisner, 2006; Wisner et al., 2012). To help integrate children with diverse disabilities, the platform should accommodate age and ability-appropriate DRR strategies and messages in line with the safe schools' safety framework (UNESCO, 2013).

With appropriate disability support strategies, flexible tools and approaches, resource and policy provisions, children with disabilities are able to identify disaster risks by mapping safe and unsafe areas/locations within their school. They can identify vulnerabilities, capacities, and the potential role they can play in a school context in the face of a natural hazard (Ronoh et al., 2016b). Ultimately, enhancing inclusiveness in DRR requires a framework that emphasises the engagement of both the students, staff and relevant stakeholders (UNESCO, 2013) and also takes collective actions. The proposed integrated framework envisions school DRR planning and actions are to be taken collaboratively among stakeholders. The ability of children with disabilities to face natural hazards and reduce vulnerability relies on appropriate disability support put in place, and empowerment by facilitating access to necessary resources (Gaillard, 2010), and according them voice and opportunities to participate.

In schools, however, three related challenges to integration of actions were identified in the study. First, there is distrust and uneven power relations between affected relevant stakeholders. The second issue is the absence of space for dialogue across a hierarchy of scales among all stakeholders, among children (with diverse abilities) and with adults. The low priority accorded to DRR by those most at risk is the third issue that complicates actions to be taken. Often, for schools this is a case of other pressing concerns, limited resources, time, heterogeneity among children, and space accorded to DRR by local stakeholders, and/or competition from other key issues and school programmes (GNDR, 2011; UNISDR, 2011; Johnson et al., 2014).

Overall, in the establishment of inclusive DRR actions, measures and contexts play a significant role: the local geographic, social, economic and political dimensions among varying locations, contexts and individuals. Decisions concerning actions to be taken should be based on the available resources the people can access (Gaillard, 2010; Sanderson, 2012), and in this case, children with disabilities. From the research findings, it implies that children who have limited access to resources or have fragile livelihoods, are also those who have a reduced ability to face natural hazards and often make up most of those affected by disasters (Wisner et al., 2004), a situation this disability inclusive framework aims to address. Children with disabilities should have as much access to DRR resources as the children without disabilities, and having a disability should not make them more at risk from disaster.

7.6.3 Providing children with voice

The DRR process should start with dialogue among stakeholders for a number of reasons. In schools, effective communication is essential to build trust between children with disabilities and adults, comprising teachers, caregivers, and other stakeholders (such as Emergency and Civil defence, Red Cross, Education and District health officials). Indeed, the absence of an appropriate platform and tools mutually trusted by all stakeholders is to blame for the lack of progress amongst stakeholders and pertaining to DRR (Gaillard and Mercer, 2013). For example, dialogue among children and teachers, on one hand, and parents, education, Civil defence, Red Cross, and District health board officials, on the other, can gain a deeper insight into the complexities in supporting DRR initiatives among children with disabilities. A deep understanding of local school settings, including the geographical location and potential natural hazards and varied disabilities, obtained through dialogue helps in the provision of tailored disability support, which is based on available resources and capacity.

The current study identified insufficient or at times the absence of dialogue in developing disability inclusive DRR strategies in school. There emerged existing communication gaps between the children, teachers, and relevant stakeholders. Although the teachers acknowledge children's potential to contribute to school DRR planning, they often cited limitations due to the schools' structure and existing routines that undermined opportunities for the children's voice. In one school, teachers and other school staff would hold their planning meeting, while students held a separate meeting, and the opportunity for dialogue was absent (Ronoh et al., 2016a). The school working system and decision making structures reflect existing power relations between the children and adults. In addition, ineffective communication was also evident in the Auckland school as presented in Chapter 5. The teachers and the children interviewed were unaware of a potential tsunami hazard in Auckland. This lack of awareness around a tsunami hazard is probably an indication of both the challenges to the Civil Defence top-down approach to DRR communication and a possible exploitation of power relations where children are at the lower end of the communication chain. Among the stakeholders interviewed, Red Cross and Civil Defence officials often blamed each other for gaps in disability-inclusive DRR (Ronoh et al., 2015b), including instances where some people with disabilities were turned away from evacuation centres (Phibbs et al., 2012; Ronoh et al., 2015b). Clearly, dialogue between children with disabilities and stakeholders would help in the information exchange and in collaboratively designing DRR initiatives to fill identified gaps. All the stakeholders interviewed recognised the lack of effective communication and acknowledged the need for a platform for multi-stakeholder dialogue to strengthen partnership in school DRR planning.

Dialogue can take various forms, such as participatory numbers (Chambers, 2012) or Participatory 3 Dimensional Mapping (Cadag and Gaillard, 2012). The proposed disability inclusive framework and associated forms of participatory tools are necessary for effective communication for three important reasons. First, it helps resolve issues associated with skewed power relations in favour of adults. Mapping activities used within such a framework present a viable option to engage children with diverse disabilities, integrate knowledge and action. Participatory tools enable different stakeholders to engage and discuss, and facilitates collaboration and effective partnership (Fazey et al., 2010; Gaillard and Mercer, 2013). Second is the tools' potential to appreciate children's learning styles and preferred means of communication in developing effective alternative methods (Chambers, 2012). Third is an acknowledgment of heterogeneity among children with diverse disabilities by combining varied tools and a scaled approach to their levels of involvement, along their spectrum of abilities (Ronoh et al., 2016c).

Subsequently, the participatory tools used in this research facilitated dialogue among the children, on one hand, and, on the other, between the children as key stakeholders and adults. According to the proposed framework, children with disabilities and adult participants can be brought together through an established school board to contribute to DRR planning in diverse ways. For example, during the study, children became involved in various initiatives, such as mapping hazards, vulnerability and capacity assessment around their school. Children with speech and visual impairments were actively engaged in the proportional piling and the tactile school map activity. These specific activities provided these children with both a visual and kinaesthetic spatial experience. The activities enabled them to contribute to the ranking of natural hazards, and identifying perceived risks, and safe and unsafe spaces within their school.

Yet another group became involved in workshops and presentation of their work. Children from one of the schools, for instance, took action based on their experience, to support a DRR awareness campaign in their school through parent teacher meetings. In these cases, children with diverse disabilities (such as those with limited literacy, speech and hearing impairments), who are often the most marginalised, can have their voices heard, by presenting their views/perceptions about natural hazards, and help identify vulnerabilities and capacities. Their voice and needs are then incorporated in action-planning for ongoing DRR activities (UNESCO, 2013). Crucially, such a framework helps empower the children by granting them access to a scientific platform (e.g. a map), an avenue for including children's voice among multi-stakeholder forums and rendering their own knowledge credible in the eyes of adults, a necessary ingredient to a collaborative approach to DRR.

7.7 Strengths and limitations of the study

Case studies as opposed to surveys and experiments accommodate uncertain boundaries between the phenomena being studied and the context (Yin, 2012). Case studies are tailor-made to respond to ‘how and why’ questions about contemporary events and enable an approach to tackle information that is often difficult to obtain, such as the case for children with disabilities.

As in other forms of qualitative research, the reliability and credibility of the results is dependent upon the level of rigor applied during the research process and analysis to ensure the accuracy of the findings. For this research a number of steps were taken. First, workshop activities and protocol (See table 3.2) were developed to be adopted in all three study sites to ensure consistency. This approach addressed both internal and external credibility issues as it helped to check on my own biases about case study sites in presenting research findings. Facilitators in all these sites would meet to plan and prepare prior to the start of the workshops. In addition, the workshop process also provides team details, resources, guidance on its facilitation, and audit/log trails, all of which are valuable for potential replicability.

Second, to increase the reliability and validity of the analysis, triangulation of multiple case studies, methods, and sources of data was used. Data triangulation helps strengthen the construct validity of the case study since multiple perspectives and measures of the same phenomena are provided (Yin 2014). Thus, in this research, the triangulation of data from various sources – field notes, photographs, audio-recordings, and memo writing – increases confidence that the case study findings are accurate. The observation/field notes were compiled as a detailed reflection of daily activities, thus helping triangulate and increase the reliability of evidence (Creswell, 2013). The approach enabled the research to progress while keeping and creating a database of findings as a way of increasing their reliability. A deliberate effort was made to constantly compare data with codes, and writing memos around codes and their definition (Creswell 2013).

Other important steps to enhance credibility and reliability of this research were the brief reports written and shared within the research team and with individual case study schools. These steps helped facilitate peer debriefing of discussions findings, and the overall data interpretation. Notably, the three case study schools were particularly receptive to these findings. Also, the reviewers for the five peer reviewed publications provided “external auditor” reports all indicating that although the research is carried out in New Zealand, the findings are relevant to DRR policy makers, and practitioners internationally. Ultimately the multiple case study and multi method approach offered an opportunity to the researcher to analyse within and across cases, and significantly covered different contextual conditions that substantially expand the generalisability of the findings to a broader array of contexts than a single case could have (Yin, 2009).

This thesis has touched on a number of challenges and limitations, both ethical and methodological, in the research process. The ethical process and research protocol involving human participants (Skelton, 2008) is justifiably heightened when children with disabilities are participants. For example, there is potential harm research may cause, because they are often silenced, unheard, and unprotected (Powell and Smith, 2010). Given the children's vulnerability due to extreme impairments and lack of autonomy (Morrissey, 2012), the potential to exploit them as participants exists. They also have less power of redress when their words are used or even mispresented (Booth and Booth, 1996). They are generally marginalised in an adult-dominated society, and thus experience unequal power relations with adults in their lives (Liamputtong, 2007). It was critical that the research activities and data collection process was guided by the University of Auckland Human Participants Ethics Code of Conduct (submission approved on 12/5/2014, Reference Number 011865).

However, ethical prescriptions required by some schools initially approached for this study (and later excluded) were too cumbersome for the researcher to fulfil. Some school principals were not willing to initiate any engagement or discussion until institutional ethics approval for the research had been obtained. On the other hand, the institutional ethics committee board recommends obtaining and presenting supporting documents from potential schools during the research ethics application. This scenario at the initial stage of the research presented the researcher with a 'Catch 22' situation (Milne, 2005). To overcome the access challenge, contacts from relevant agencies who work closely with the schools provided the required initial connection. Although most schools in Christchurch and Hawke's Bay showed interest in being involved, in Auckland, a consultant paediatrician who worked with the schools was crucial in linking the researcher with potential Auckland schools to take part in the research. The initial contact and further follow-up discussions, enabled the researcher to obtain letters of support from the schools, often required by funders and human ethics review boards, as was the case in this research. Children with disabilities came last in this complex chain of consent despite their enthusiasm to participate—they were only to be heard once many layers of gatekeepers and adult consents were negotiated (Boggis, 2011).

The difficulty of accessing children with disabilities as research participants brought into question the use of participatory methods for data gathering. While participatory techniques aim to ensure participants' involvement at all stages of research (Mercer et al., 2008), for children with disabilities in this study, the ethical requirements and associated processes of access became a road block to their involvement in decision-making at the initial phase of formulating research methods. Again, as a PhD study where the researcher largely controls the research, it highlights the academic research/tension of navigating ethical and administrative requirements (involving school boards, principals, parents and the University) or expectations of having a set activities for the school and the children in place. The researcher's need for utilisable information meant collecting consistent and comparable data among three case study schools. This therefore required the use of indicators to be pre-defined by the researcher and then applied in every case study school. In addition, having to address particular objectives often calls for keeping a certain level of control over the participatory process, which substantially limited the space for creativity of participants. However, to obtain relevant data, the research utilised flexible participatory tools (Ronoh et al., 2016c) and worked with specialist teachers to enable the engagement of children with diverse abilities in research and to obtain their perspectives on their space and place (Goodfellow, 2012) in relation to potential disaster risk.

Another limitation of this research was the lack of a direct comparison with children without disabilities to make stronger conclusions. For example, when the survival kit findings were compared to previous research by a questionnaire survey in a mainstream school on children aged between 10 and 12 (Finnis et al. 2004), there were notable similarities. Both studies report children placing high importance on torches, first aid kits, radios, and spare batteries in an earthquake (Ronoh et al., 2015b). Although the thesis is not so much about how children with disabilities differ from children without disabilities, but more about their capacities when inclusive methods are used in DRR, there is a need to further extend such research to a mainstream school where both children with and without disabilities are participants. Also, survey data for comparing children with and those without disabilities and pre- and post-evaluation activities to obtain prior knowledge would provide an additional source of data and strengthen arguments and conclusions to the associated research findings. In addition, further incorporation of pre- and post-evaluation activities (Ronan and Johnston, 2001) to assess and strengthen conclusions in relation to children's understanding and awareness issues can be considered.

Working among children with disabilities involve a delicate balance between when to rely on student's voice or on input from the teachers or caregivers who would often correct or clarify children's assertions. This was largely a result of inconsistencies between what students would say and what happened in reality, or those who would exaggerate their abilities or understandings. Teachers and caregivers provided support and help in assembling and annotating the maps, with the children providing relevant explanations. Students participated with support from teachers on the choice of colours, such as the use of green and red push pins or paintings to represent safe and unsafe spaces respectively in an earthquake. Those children who are colour blind may not effectively participate and future research may incorporate the use of tactile symbols of varied shapes instead. Again, although the research captures experiences and perceptions of natural hazards and disaster risk from children who attend school, one other limitation is that the same study may be less applicable to cases elsewhere in the world with different disaster experiences and contexts, or in less developed countries where most children with disabilities probably do not attend school (Kuper et al., 2015). A significant acknowledgement, therefore, is that the involvement of children with disabilities in the research and decision-making process is intricate and time-consuming. It involves adults and children developing new skills or tools, and thus requires investment of disability support strategies and resources. Often it entails a major shift in attitude within schools, the society and in power relations in favour of the 'children's potential capacity' narrative (Haynes and Tanner, 2013).

7.8 Opportunities for future research

The overarching theme of this thesis is how we can promote capacities and enhance the role of children with disabilities in DRR, and by extension, reduce their vulnerability by improving their access to resources and information. Empowerment thus occurs by encouraging their participation in DRR initiatives, providing the necessary support and ensuring equitable treatment (Peek, 2008). However, due to the exploratory nature and limited scope of this study, and general scarcity of empirical research, there remain significant opportunities for future research and more knowledge-gains in further analysing the experiences and potential role of children with disabilities in DRR.

For example, it is still unclear how distinct child characteristics such as age, ethnicity, gender and family structure intersect with disability to influence their experiences and perceptions of natural hazards and disasters. This research attempts to compare the three case studies, their geographical locations and varying natural hazards, and disaster experiences. However, conducting further comparative studies in different regions or countries affected by distinct disasters would enable researchers to clearly define local dimensions relevant across children with disabilities. Another avenue is the need for research to use time series strategy (Jonson and Ronan, 2011), and follow a cohort to assess the significance of involving children with disabilities in DRR initiatives, and how previous or current involvement influences their future response, should another natural hazard event occur. With increasing disaster events, globally, both in frequency and intensity, it is critical that disaster researchers and practitioners continue to develop new ways to learn and work with children with disabilities.

To build on this research, there is a need for research that focuses on the analysis and development of educational and DRR resources incorporated to meet the differing needs of children, such as diverse disabilities and ages (UNESCO, 2013). Such a study should also establish how the different needs of children with disabilities intersects with the potential natural hazards a school may be exposed to in its geographic location (Wisner et al., 2012). This thesis also reveals how school teachers, peers and parents are an essential source of support for children. The thesis illuminates the reliance and support children with disabilities require from their social network: parents, teachers and peers. Subsequently, it is vital for future research to establish how individuals within the children's social networks are themselves affected by disaster, and how its effects influence their response and support for the child. Ultimately, inclusive rather than individual DRR action (Shaw, 2012) should be based on an integrated assessment of hazard risk, vulnerability and capacities, and available resources. Participatory tools used within a disability inclusive framework can give voice and empower children with disabilities, enabling them to identify their pre-existing capacities and recognise the important role their local knowledge can play within DRR (Wisner et al., 2012).

7.9 References

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Appendices

Appendix A: Participant Information Sheet

Appendix A.1

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
School of Environment, Human Science Building,
10 Symonds Street, Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland, Private Bag 92019, Auckland, New Zealand

PARTICIPANT INFORMATION SHEET: Staff from CDEM, DHB and Zealand Red Cross

Project title: Children with disabilities and disaster risk reduction.

Name of researcher: Steve Ronoh

Researcher introduction: Steve Ronoh is a PhD candidate in the School of Environment, The University of Auckland. The research is being conducted, under the supervision of Associate Professor J. C Gaillard and Dr Jay Marlowe.

Project description and invitation: You are invited to participate in this research which will assess and interpret the experiences of children with disabilities in facing natural hazards and identify their actual and potential contribution to disaster risk reduction. The ongoing research aims to provide knowledge and understanding of how children with disabilities face and/or perceive disaster and crucially identify how they can contribute to disaster risk reduction (DRR).
Three case study areas; Auckland, Napier and Christchurch, are represented by one school working with children with disabilities. Each of the respective schools has been approached separately for consent. This qualitative research involves a semi-structured interview. First, I would like to ask your permission to engage in a semi-structured interview to share your experience and thoughts on how children with disabilities can contribute to DRR and recovery process. To conduct this project, first I must get your permission by reading the Participant Information Form and consenting to the form enclosed for you to read and sign.

Project procedures: If you consent to participate, it will involve a face-to-face interview with you that shall last around half to three quarter of an hour. Participation in this interview is voluntary. You have the option not to answer any of the questions and may withdraw from the interview at any time without offering an explanation. You may withdraw your authorisation for the use of information you have provided to the project up to 30 days following the completion of your interview. The interview will be audio-taped at your permission.

I want to assure you that the Interview will be transcribed and, and thus data contained within them will be known only to me, my supervisors and a third party who has signed a confidentiality agreement. Within 1-2 months of the interview you will be sent a copy of the transcript to verify that it is an accurate record and to make any changes, if you wish. The data collected will be used for the purposes of writing my PhD thesis and subsequent academic journals/reports.

Data storage / retention / destruction / future use: Interview transcriptions (or researcher's notes, if the interview is not recorded) will be stored by the researcher on a memory stick (with a confidential password) in a locked cabinet for 6 years (this is the usual procedure at The University of Auckland). It will then be deleted by the researcher (or shredded if notes).

Right to withdraw from participation: Participants may decline to be interviewed, decline to be audio-recorded and/or stop the interview at any time. Participants may withdraw from participation at any time and may withdraw their data from the research up until 4 weeks after receipt their transcripts stage.

Anonymity and confidentiality: Reports and publications will be done in a way that does not identify the participants. Pseudonyms will be used for all participants and only the names of case study regions will be identified. Participants will be made aware of this prior to their participation using Participant Information Sheet, Consent Form and orally.

For any inquiries and further information please use the contacts details below:-
Researcher: Steve Ronoh, sron443@aucklanduni.ac.nz, Ph. (09)373 7599 ext 82370
Supervisor: Associate Professor J C Gaillard, jc.gaillard@auckland.ac.nz, Ph. (09) 373 759 ext 89679
Supervisor: Dr Jay Marlowe, j.marlowe@aucklanduni.ac.nz, Ph. (09) 623 8899 ext 48248

For any queries regarding ethical concerns: You may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone (09) 373 7599 extn. 87830/83761. Email: humanethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix A.2

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND

School of Environment, Human Science Building,
10 Symonds Street, Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland, Private Bag 92019, Auckland, New Zealand

PARTICIPANT INFORMATION SHEET: The CEO/Director (CDEM, DHB, New Zealand Red Cross)

Project title: Children with disabilities and disaster risk reduction.

Name of researcher: Steve Ronoh

Researcher introduction: Steve Ronoh is a PhD candidate in the School of Environment, The University of Auckland. The research is being conducted, under the supervision of Associate Professor J. C Gaillard and Dr Jay Marlowe.

Project description and invitation: You are invited to participate in this research which will assess and interpret the experiences of children with disabilities in facing natural hazards and identify their actual and potential contribution to disaster risk reduction. The ongoing research aims to provide knowledge and understanding of how children with disabilities face and/or perceive disaster and crucially identify how they can contribute to disaster risk reduction (DRR).

Three case study areas; Auckland, Napier and Christchurch, are represented by one school working with children with disabilities. Each of the respective schools has been approached separately for consent. This qualitative research involves semi structured interviews.

I would like to ask your permission to engage one of your staff members in a semi-structured interview to share the organisation’s work, experience and thoughts on how children with disabilities can contribute to DRR and recovery process. To conduct the semi structured interview; first I must get your permission as the Chief Executive/Director by reading and consenting to the form attached. I also seek your assurance that the staff member’s decision to participate or not in this research will not affect their employment or relationship with to the organisation in any way.

Project procedures: If you consent to participate, you will be requested to support and facilitate the semi-structured interview and by initially providing a Participant Information Sheet (PIS) to the potential participant. The organisation’s participation is voluntary. Participation will be in the form of a semi-structured interview. The interviewee would ideally be currently teaching some of the children participants. Care givers (potential interviewees) would be staff member who works or provides policy advice to schools working children with disabilities.

I would conduct the semi structured interview at a time and place nominated by the participant and approved by you. I would inform the interviewee that the semi- structured interviews will be audio-taped and that they may ask that the recorder be turned off at any time; they may refuse to answer any questions, or they may terminate the interview. I will also assure the participant that the interview will be transcribed and thus data contained within them will be known only to me, my supervisors and a third party who has signed a confidentiality agreement.

Within 1-2 months of the interview each participant will be sent a copy of the transcript to verify that it is an accurate record and to make any changes, if they wish. The data collected will be used for the purposes of PhD thesis and subsequent academic journal/articles or reports.

Data storage / retention / destruction / future use: Interview transcriptions (or researcher’s notes, if the interview is not recorded) will be stored by the researcher on a memory stick (with a confidential password) in a locked cabinet for 6 years (this is the usual procedure at The University of Auckland). It will then be deleted by the researcher (or shredded if notes).

Right to withdraw from participation: Participants may decline to be interviewed, decline to be audio-recorded and/or stop the interview at any time. Participants may withdraw from participation at any time and may withdraw their data from the research up until 4 weeks after receipt their transcripts stage.

Anonymity and confidentiality: Reports and publications will be done in a way that does not identify the participants. Pseudonyms will be used for all participants and only the names of case study regions will be identified. Participants will be made aware of this prior to their participation using Participant Information Sheet, Consent Form and orally.

For any inquiries and further information please use the contacts details below:-
Researcher: Steve Ronoh, sron443@aucklanduni.ac.nz, Ph. (09)373 7599 ext 82370
Supervisor: Associate Professor J C Gaillard, jc.gaillard@auckland.ac.nz, Ph. (09) 373 759 ext 89679
Supervisor: Dr Jay Marlowe, j.marlowe@aucklanduni.ac.nz, Ph. (09) 623 8899 ext 48248

For any queries regarding ethical concerns: You may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone (09) 373 7599 extn. 87830/83761. Email: humanethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix A.3

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND

School of Environment, Human Science Building,
10 Symonds Street, Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland, Private Bag 92019, Auckland, New Zealand

PARTICIPANT INFORMATION SHEET: Child Carer

Project title: Children with disabilities and disaster risk reduction.

Name of researcher: Steve Ronoh

Researcher introduction: Steve Ronoh is a PhD candidate in the School of Environment, The University of Auckland.

Project description and invitation:
You are requested to give consent for the participation of the child under your care in this research. You are also invited to participate in this research which will assess and interpret the experiences of children with disabilities in facing natural hazards and identify their actual and potential contribution to disaster risk reduction. The proposed research aims to provide knowledge and understanding of how children with disabilities face and/or perceive disaster and crucially identify how they can contribute to disaster risk reduction (DRR).

Three case study areas; Auckland, Napier and Christchurch, will be represented by one school with children with disabilities. Each of the respective school's will be approached separately for consent. This research will involve the following research activities for carers and their children:

- Focus groups discussions for children participants (Including drawing and making 3-D maps of the surrounding).
- Semi-structured interviews conducted with carers and teachers.
- Observation children participants during one their fire/disaster simulation drills (carried out once a term in school).

It is anticipated that 3 research weeks (staggered for over 9-12 months) will be undertaken in each participating school. You have been invited as a potential participant in this research as you are a Parent/Carer at -------------- School. First, I must get your permission by also reading the Participant Information Form (attached) for the child under your care, and also consenting to both forms attached. One as for your participation and the other is consent for the child under your care to participate.

Project procedures: If you consent, you will be present to provide support to the children while they carry out their focus group activities. You will also participate in a semi-structured interview (45-60 minutes) about your understanding of disaster risk reduction procedures within the school community. Your participation is voluntary. The Principal/BOT has given an assurance that your decision to participate, or not, in the research will not affect your relationship with the school. I would travel to school and conduct the interview at a time and place nominated by you and approved by the school principal. The interview will be audio-taped and that you may request that the recorder be turned off at any time, may refuse to answer any questions, or may terminate the interview.

I want to assure you that the Interview will be transcribed and, and thus data contained within them will be known only to me, my supervisors and a third party who has signed a confidentiality agreement. Within 1-2 months of the interview you will be sent a copy of the transcript to verify that it is an accurate record and to make any changes, if you wish. The data collected will be used for the purposes of writing my PhD thesis and subsequent academic journals/reports.

Data storage / retention / destruction / future use: The semi-structured interview will, with your permission, be audio recorded and transcribed by the interviewer. A summary of findings will be sent to you by the researcher at the conclusion of research, if you are interested. Your interview transcription (or researcher's notes, if the interview is not recorded) will be stored, separately from consent forms by the researcher on a memory stick (with a confidential password) in a locked cabinet for 6 years (this is the usual procedure at The University of Auckland). It will then be deleted by the researcher.

Right to withdraw from participation: You may decline to be interviewed, decline to be audio-recorded and/or stop the interview at any time. Participants may withdraw from participation at any time and may withdraw their data from the research up until 4 weeks after receiving transcripts. An arrangement for a relieving teacher to be in school and lead alternative learning activities while research is taking place for those who choose not to take part. The alternative learning activity will be arrived at in consultation with their specialist teacher. Carers whose children are not participants will also be excluded in the semi-structured interview.

Anonymity and confidentiality: Reports and publications will be done in a way that does not identify the participants. Pseudonyms will be used for all participants. Only photographs of students' drawings, maps/3Dmaps (therefore removing any identifying features e.g. names or even children in pictures), and researchers' field notes will be taken away. Only the names of the study (Geographical) regions will be identified.

For any inquiries and further information please use the contacts details below:-

Contact details: *Researcher*: Steve Ronoh, sron443@aucklanduni.ac.nz, Ph. (09)373 7599 ext. 82370
Supervisor: Associate Professor J C Gaillard, jc.gaillard@auckland.ac.nz, Ph. (09) 373 759 ext. 89679
Supervisor: Dr Jay Marlowe, j.marlowe@aucklanduni.ac.nz Ph. (09) 623 8899 ext. 48248
If you were to get distressed during the interview and wanted to speak to someone you could contact the following number for support: 0800 543 354 (Lifeline 24/7 *Helpline).*

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone (09) 373 7599 extn. 87830/83761. Email: humanethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix A.4

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND

School of Environment, Human Science Building,
10 Symonds Street, Auckland, New Zealand

Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland, Private Bag 92019, Auckland, New Zealand

PARTICIPANT INFORMATION SHEET: Teacher

Project title: Children with disabilities and disaster risk reduction

Name of researcher: Steve Ronoh

Researcher introduction: Steve Ronoh is a PhD candidate in the School of Environment, The University of Auckland.

Project description and invitation:
You are invited to participate in this research which will assess and interpret the experiences of children with disabilities in facing natural hazards and identify their actual and potential contribution to disaster risk reduction. The proposed research aims to provide knowledge and understanding of how children with disabilities face and/or perceive disaster and crucially identify how they can contribute to disaster risk reduction (DRR).

Three case study areas; Auckland, Napier and Christchurch, will be each represented by one school with children with disabilities. Each of the respective school's will be approached separately for consent. This research will involve the following research activities that will require your participation:-

- Supporting the facilitation of focus group discussions with children participants (that Include drawing and making 3-D maps of the surrounding).
- Participating in a semi-structured interview conducted with teachers.
- Conducting the school fire/disaster simulation drills carried out once a term that will be observed.

It is anticipated that 3 research weeks (staggered over 9-12 months) will be undertaken in each participating school. You have been invited to participate in this research as you are a teacher at ---------------School. First, I must get your permission by reading and consenting to the two consent forms attached; one for your participation in a semi-structured interview. The other is accepting to be present and support children participants undertake focus group activities and fire/disaster drills.

Project procedures: If you consent, you will be present and provide support to the children while they carry out their focus group activities and fire/disaster drills. You will also participate in a semi-structured interview (45-60 minutes) about your understanding of disaster risk reduction procedures within the school community and the child under your care. Your participation is voluntary. The Principal/BOT has given an assurance that your decision to participate, or not, in the research will not affect your employment status or relationship with the school. I would travel to the school and conduct the interview at a time and place nominated by you and approved by the school principal. The interview will be audio-taped and that you may request that the recorder be turned off at any time, may refuse to answer any questions, or may terminate the interview.

I want to assure you that the interview will be transcribed, and thus data contained within them will be known only to me, my supervisors and a third party who has signed a confidentiality agreement. Within 1-2 months of the interview you will be sent a copy of the transcript to verify that it is an accurate record and to make any changes, if you wish. The data collected will be used for the purposes of writing my PhD thesis and subsequent academic journal/articles.

Data storage / retention / destruction / future use: The semi-structured interview will, with your permission, be audio recorded and transcribed by the interviewer and a third party who has signed a confidentiality agreement. A summary of findings will be sent to you by the researcher at the conclusion of research, if you are interested.

Your interview transcription (or researcher's notes, if the interview is not recorded) will be stored, separately from consent forms by the researcher on a memory stick (with a confidential pass word) in a locked cabinet for 6 years (this is the usual procedure at The University of Auckland). It will then be deleted by the researcher.

Right to withdraw from participation: You may decline to be interviewed, decline to be audio-recorded and/or stop the interview at any time. Participants may withdraw from participation at any time and may withdraw their data from the research up until 4 weeks after receiving transcripts.

Anonymity and confidentiality: Reports and publications will be done in a way that does not identify the participants. Pseudonyms will be used for all participants. Only photographs of students' drawings, maps/3Dmaps (therefore removing any identifying features e.g. names or even children in pictures), and researchers' field notes will be taken away. Only the names of the study (geographical) regions will be identified.

For any inquiries and further information please use the contacts details below:-

Contact details: *Researcher*: Steve Ronoh, sron443@aucklanduni.ac.nz, Ph. (09)373 7599 ext. 82370
Supervisor: Associate Professor J C Gaillard, jc.gaillard@auckland.ac.nz, Ph. (09) 373 759 ext. 89679
Supervisor: Dr Jay Marlowe, j.marlowe@aucklanduni.ac.nz , Ph. (09) 623 8899 ext. 48248
If you were to get distressed during the interview and wanted to speak to someone you could contact the following number for support: 0800 543 354 (Lifeline 24/7 *Helpline).*

For any queries regarding ethical concerns you may contact the Chair, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone (09) 373 7599 extn. 87830/83761. Email: humanethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix A.5

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
School of Environment, Human Science Building,
10 Symonds Street, Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland, Private Bag 92019, Auckland, New Zealand

PARTICIPANT INFORMATION SHEET: Student: Child Participant

Project title: Children with disabilities and disaster risk reduction

Name of researcher: Steve Ronoh
Steve Ronoh is a research student at The University of Auckland

Invitation: You are invited to take part in a study about the experiences of children with disabilities in times of disaster and identify how to reduce effects of disasters. It is your choice to take part. Read the other form (assent) attached and you can choose Yes or No

Where will the study take place?
Auckland, Napier and Christchurch represented by 1 school each. Your school is representing ____. You have been invited to participate in this research because you are a student at ____________________School

What would be involved (activities)?
If you accept**,** you will be participating in the following activities

1. Focus /Group discussions with children (also drawing maps and making 3D/ maps). You will be asked to draw and discuss maps/pictures of the school surrounding and then build/make a 3D map of the surrounding. Local materials like cartons will be used to make the 3D map of the surrounding.
2. School Fire/disaster simulation drills to be observed by the researcher

I will travel to your school and agree with principal and your teacher on how to do these activities. The focus group discussions will be tape-recorded so that I can remember and understand everything you have said.

Will anyone know what I have said?
I want to assure you that the focus group discussion data will be known only to me, my supervisors and someone who has signed an agreement not to discuss your personal details with others. The Information collected will be used for writing my PhD qualification and other reports.

How long will it take?
1/ Focus/Group discussions (and drawing and making 3-D maps of the surrounding): This will be done for 2 hours each day and it is planned to take 4 days.
2/ School fire or disaster evacuation practice/drill: To take up to 45 minutes.

What happens to the information and the maps I give?
All information recorded, notes taken and photographs of maps will be kept safely by the researcher in a memory stick in a locked cabinet for 6 years (at The University of Auckland). It will then be destroyed by the researcher. Your name will not be used in any report. Reports will be done in a way that does not identify or say the names of those who gave the information. Only photographs of your drawings and maps (that do not have your names or pictures) will be taken by the researcher.1

Your rights and choices:
It is your right and choice to take part voluntarily in this research. It is your choice to refuse to participate in the discussions or map activities. The Principal accepts that if you take part in the research, it will not affect your

learning, enrolment or relationship with the school. You may choose not to be part of the study at any time and may ask your drawings not to be included in the research up to 1 month after participation.

What if I choose not to take part?

There is a plan agreed with your principal and teacher that you will have a different learning activity during the time of research. A relieving teacher will be in school to lead that learning activity when research is going on. The learning activity will be decided/prepared by your teacher.

Where do I get help if I get upset, concerned, worried or require counselling?

School counselling/support services; Name: (Phone) ________________
Lifeline 24/7 *Helpline* (Phone) 0800 543 354 or
Youth line counselling services (Phone) 0800 376633 or Free Text 234

Who is doing this research?

Researcher: Steve Ronoh, sron443@aucklanduni.ac.nz, Ph. (09)373 7599 ext. 82370
Supervisor: Associate Professor J C Gaillard, jc.gaillard@auckland.ac.nz, Ph. (09) 373 759 ext. 89679
Supervisor: Dr Jay Marlowe, j.marlowe@aucklanduni.ac.nz, Ph. (09) 623 8899 ext. 48248

What If I have other questions about this research?

Contact the Chairperson, The University of Auckland Human Participants Ethics Committee, The University of Auckland, Research Office, Private Bag 92019, Auckland 1142. Telephone (09) 373 7599 extn. 87830/83761. Email: humanethics@auckland.ac.nz.

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix B: Consent Form

Appendix B. 1

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
School of Environment
Human Science Building, 10 Symonds Street
Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM
(CEO/Director)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Children with disabilities and disaster risk reduction.

Name of Researcher: Steve Ronoh
I have read the Participant Information Sheet; have understood the nature of the research and why I have been selected. I have had the opportunity to ask questions and have them answered to my satisfaction.

- I understand that the schools' participation in this research is voluntary.
- I agree to support and facilitate the interview process within our organisation and in providing initial PIS to potential participant (staff member)
- I understand that I am free to withdraw the organisations participation at any time, and to ask to withdraw any data traceable to the school up until four weeks after the completion of the research activities.
- I understand that if I do decide that the organisation withdraws participation from this study, I will not have to provide a reason.
- I understand that the interview will be audio-taped.
- I understand that participants are free to request that the recorder be turned off at any time during the interview or discussion.
- I understand that a third party who has signed a confidentiality agreement will transcribe the digital recordings.
- I understand that my name, or name of the participant be used in the research report.
- I understand that this Consent Form will be securely stored separately from other research data for 6 years beyond the completion of the research, when both will be destroyed.
- I understand that the data gathered from the semi-structured interview will be used for writing a PhD thesis, academic publications and conference presentations.
- I understand that the participants decision to participate or not in this research should not affect their employment or relationship to the organisation in any way.

CEO/DIRECTOR signature…………………………………………………….

Date…………………………………..

First name pseudonym……………………………………………………………………………………

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Numb

Appendix B. 2

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
School of Environment
Human Science Building, 10 Symonds Street
Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM

(Staff member: Semi-structured interview)

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Children with disabilities and disaster risk reduction.

Name of Researcher: Steve Ronoh
I have read the Participant Information Sheet; have understood the nature of the research and why I have been selected. I have had the opportunity to ask questions and have them answered to my satisfaction.

- I agree to take part in this research.
- I understand my participation is voluntary.
- I agree to participate in a **semi-structured interview,** and understand it will take 30 to 45minutes.
- I understand that I may ask to have the recorder switched off at any time.
- I wish / do not wish to have my recordings sent to me.
- I wish / do not wish to check the transcript of my interview.
- I understand that I may withdraw the information I provided on the interview up until four weeks after receiving the transcript.
- I understand that the CEO/Director has given assurance that my decision to participate, or not, in the research will not affect my employment status or relationship with the organisation.
- I understand that no identifiable information from the interview will be reported back to the CEO or Director.
- I wish / do not wish to receive the summary of findings.
- If you would like to receive a transcript, a digital copy of the interview and / or a summary of findings, please include your email address here: ………………………………………………………………
- I understand that a third party who has signed a confidentiality agreement will transcribe the digital recordings.
- I understand that this Consent Form will be securely stored separately from the research data for 6 years beyond the completion of the research, when both will be destroyed.
- I understand that while all efforts will be made to protect my identity, confidentiality of my information cannot be guaranteed due to the small size of this study.
- I understand that my name will not be used in any written documents or oral presentation without my permission.
- I understand that the data gathered from semi-structured interviews will be used for a PhD thesis, academic publications and conference presentations.

Name:
Signature:
Date:

First name pseudonym…………………………………………………………………………………………

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix B. 3

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
School of Environment
Human Science Building, 10 Symonds Street
Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM

(Carer: Semi-structured interview**)**

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Children with disabilities and disaster risk reduction.
Name of Researcher: Steve Ronoh

I have read the Participant Information Sheet; have understood the nature of the research and why I have been selected. I have had the opportunity to ask questions and have them answered to my satisfaction.

- I agree to take part in this research.
- I agree to participate in a **semi-structured interview,** and understand it will take up to 60 minutes.
- I understand that I may ask to have the recorder switched off at any time.
- I wish / do not wish to have my recordings sent to me.
- I wish / do not wish to check the transcript of my interview.
- I understand that I may withdraw the information I provided on the interview up until four weeks after receiving the transcript.
- I understand that the Principal/BOT has given assurance that my decision to participate, or not, in the research will not affect my relationship with the school.
- I understand that no information from the interview will be reported back to the Principal, any teacher or other board member of this school.
- I wish / do not wish to receive the summary of findings.
- If you would like to receive a transcript, a digital copy of the interview and / or a summary of findings, please include your email address here: ……………………………………………………………
- I understand that a third party who has signed a confidentiality agreement will transcribe the digital recordings.
- I understand that this Consent Form will be securely stored separately from the research data for 6 years beyond the completion of the research, when both will be destroyed.
- I understand that while all efforts will be made to protect my identity, confidentiality of my information cannot be guaranteed due to the small size of this study.
- I understand that some data associated with specific places on the maps being photographed may not be anonymous and may be an issue in identifying participants.
- I understand that my name will not be used in any written documents or oral presentation without my permission.
- I understand that the data gathered from the semi-structured interviews and focus group will be used for a PhD thesis, academic publications and conference presentations.

Name:
Signature:
Date:
First name pseudonym…………………………………………………………………………………………

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix B. 4

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
School of Environment
Human Science Building, 10 Symonds Street
Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland
Private Bag 92019
Auckland, New Zealand

CONSENT FORM

(Carer: Consent for Childs' participation**)**

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Children with disabilities and disaster risk reduction.

Name of Researcher: Steve Ronoh

I have read the Participant Information Sheet; have understood the nature of the research and why I have been selected. I have had the opportunity to ask questions and have them answered to my satisfaction.

- I agree/do not agree that the child under my care takes part in this research.
- I understand the Childs' participation is voluntary.
- I will be/not be available to provide support for children participants in their focus group discussions and activities.
- I understand that my child may ask to have the recorder switched off at any time.
- I understand that the Principal/BOT has given assurance that my Childs' decision to participate, or not, in the research will not affect my relationship with the school or that of the child under my care.
- I understand that a third party who has signed a confidentiality agreement will transcribe the digital recordings.
- I understand that this Consent Form will be securely stored separately from the research data for 6 years beyond the completion of the research, when both will be destroyed.
- I understand that while all efforts will be made to protect my identity and that of my child, confidentiality cannot be guaranteed due to the small size of this study.
- I understand that some data associated with specific places on the maps being photographed may not be anonymous and may be an issue in identifying participants.
- I understand that photographs of students' drawings, maps/3Dmaps (that exclude identifying features e.g. names or even children in pictures); will only be taken with participants' permission.
- I understand that only photographs of students' drawings, maps/3Dmaps (without identifying features e.g. names or children in pictures), and researchers' field notes will be taken away.
- I understand that my name and that of my child will not be used in any written documents or oral presentation without my permission.
- I understand that the data gathered from these research activities will be used for a PhD thesis, academic publications and conference presentations.

Name:
Signature:
Date:

First name pseudonym……………………………………………………………………………………………

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix C: Assent form

Appendix C. 1

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND
School of Environment
Human Science Building, 10 Symonds Street
Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland
Private Bag 92019
Auckland, New Zealand

ASSENT FORM

(Student: Child participant**)**

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Children with disabilities and disaster risk reduction.
Name of Researcher: Steve Ronoh

I have read the Participant Information Sheet, or the information has been read and explained to me; I have understood the nature of the research and why I have been selected.

- I understand it is my choice to take part in this study.
- I understand that my parent/carer has accepted that I take part in the research.
- I agree to take part in drawing maps and making 3D maps, while being supported by our teacher circle (Yes or No).
- I agree to be observed while doing one school fire/earthquake practice/drill, circle (Yes or No).
- I understand that the focus/group discussions will be tape-recorded.
- I give my permission to be tape-recorded, circle (Yes or No).
- I understand that it is my choice to refuse to participate in the discussions or map activities. I may choose not to be part of the study at any time and may ask my drawings not to be included in the research up to four weeks after participation.
- I understand that the Principal/BOT accepts that if I take part in the research, it will not affect my learning, enrolment or relationship with the school.
- I agree that only photographs of my drawings and maps/3Dmaps (without my name or picture) will be taken circle (Yes or No).
- I understand that only photographs of my drawings, maps/3Dmaps (without my name or my picture), and researchers’ field notes will be taken away.
- I understand that research information will be kept securely for 6 years, after which they will be destroyed.
- I understand that my name will not be used in any reports/presentation without my permission.
- I know who I can speak to if I am worried, concerned or would like to ask questions about this research (contact details are on the Participant Information Sheet).

Name of student:	Parent/Carers Name:
Signature of student:	Parent/Carer Signature:
Date:	Date:

First name pseudonym……………………………………………………………………………………

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix C.2

THE UNIVERSITY OF AUCKLAND
NEW ZEALAND

School of Environment
Human Science Building, 10 Symonds Street
Auckland, New Zealand
Phone: +64 9 373 7599 ext 88465 or 85923
The University of Auckland
Private Bag 92019
Auckland, New Zealand

ASSENT FORM

(Student: Child participant**)**

THIS FORM WILL BE HELD FOR A PERIOD OF 6 YEARS

Project title: Children with disabilities and disaster risk reduction.

Name of Researcher: Steve Ronoh

I have read the Participant Information Sheet, or the information has been read and explained to me; I understand the research and know why I have been selected.

- I know it is my choice to take part. I may choose to stop at any time.

Participation

- I know that my parent/carer has agrees that I take part in the research.
- I agree to be assisted by our teacher to draw maps and make maps **(Yes or No).**

Teachers help

- I agree to be observed/watched when practicing a school fire drill or earthquake drill- circle **(Yes or No).**

- I give my permission to be tape-recorded during discussions, circle **(Yes or No).**

Tape recorder

- I know that the Principal/BOT agree that if I take part in the research, and it will not affect my learning at Hohepa School.

- Photographs of my drawings and maps (without my name or picture) can be taken - circle **(Yes or No).**

Photographs

- I know that all research information will be safe, and will be destroyed after 6 years.

- I know research report will not put my name without my permission.

- I know who I can speak to if I am worried, upset or would like to ask questions about this research (Information on the Participant Information Sheet).

Name of student	Parent/Carers Name:
Signature of student	Parent/Carer Signature:
Date:	Date

First name (pseudonym)…………………………………………………………………………………

APPROVED BY THE UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE ON 12/5/2014 for (3) years, Reference Number **011865**

Appendix D: Question guide

Appendix D.1

Focus group questions guide for children participants (20minutes)

- ✓ **The understanding, awareness and experience of natural hazards and disasters by children with disabilities in DRR**
  1. Have you (children with disabilities) or someone you know **experienced** a disaster situation?
  2. Which natural hazards have you **experienced** and where/when?
  3. If through media, which media; internet, TV, CDEM or others specify
  4. Describe your experience

- ✓ **Crucial factors that makes children with disabilities potentially more vulnerable in facing natural hazards and root causes of vulnerability**
  1. Challenges encountered in everyday life (due to a disability or other reasons) what are the root causes?
  2. Challenges encountered while doing natural hazards and safety simulation drills at school?
  3. What challenges would you encounter when facing natural hazards/hazards or disaster situation? What are the root causes of these challenges?

- ✓ **Their actual contribution and opportunities available for promoting DRR among children with disabilities and their carers in New Zealand.**
  1. Identify opportunities and strategies currently in place for participation in DRR
  2. Roles and contributions by children with disabilities and carers.
  3. How did the children and carers cope during the Christchurch earthquake and other events? Describe and share success stories.
  4. How are your parents/carers equipped in supporting children with disabilities in disaster situation?

- ✓ **Effective strategies/avenues already in place for further development avenues in promoting DRR among children with disabilities.**
  1. Strategies that need to be supported and developed in promoting DRR?
  2. What are the strategies that could be explored for enhancing DRR among children with disabilities?
  3. Who are the schools support networks in times of Disaster and other events?
  4. Have you heard of CDEM? How can CDEM support your efforts? Is their support adequate?
  5. How can support networks and linkages be strengthened?

Appendix D.2

Semi-structured question guide for adult participants: (30- 45mins)

- ✓ **Collaboration and support role(10 mins)**
  1. Organisation’s role and experience in collaborating with schools and school children in DRR and recovery initiatives.
  2. Participant’s knowledge and description of past disaster events in relation to school children.

- ✓ **Crucial factors that makes children with disabilities potentially more vulnerable in facing natural hazards and root causes of vulnerability.(10 mins)**
  1. Challenges encountered while doing natural hazards?
  2. What challenges did/would they encounter when facing natural hazards or disaster situation? What are the root causes of these challenges?

- ✓ **Their actual contribution and opportunities available for promoting DRR among children with disabilities and their care givers in New Zealand(10 mins)**
  1. Opportunities and strategies currently in place/available for participation in DRR
  2. How did the children and carers cope during the Christchurch earthquake and other events? Describe and share success stories, roles and contributions.
  3. What are your contributions in strengthening their capacity to face natural hazards

- ✓ **Effective strategies/avenues already in place for further development avenues in promoting DRR among children with disabilities(10 mins)**
  1. What strategies need to be supported and developed in promoting DRR policies?
  2. The strategies that could be explored in enhancing DRR among children with disabilities.
  3. How do you facilitate community support networks in DRR?
  4. How does your organisation support and strengthen DRR networks and linkages