Challenges in implementing disaster risk reduction education: Views from the frontline in Indonesia

Avianto Amri, B. Eng
Risk Frontiers
Macquarie University
Bushfire & Natural Hazards Collective Research Centre

A thesis submitted to the Faculty of Science and Engineering, Macquarie University for the degree of Master of Research

Supervisors
Dr. Katharine Haynes
Macquarie University

Dr. Deanne K. Bird
Macquarie University

and

Professor Kevin Ronan
Central Queensland University

Faculty of Science and Engineering
Macquarie University
Sydney, April 2015

Candidate's Statement

I certify that: except where due acknowledgement has been made, the work is that of the author alone; the work has not been submitted previously, in whole or in part, for a higher degree to any other university or institution; the content of the thesis is a result of work which has been carried out since the official commencement date of the approved research program; and, any editorial work, paid or unpaid, carried out by a third party is acknowledged.

This study was approved by the Human Research Ethics Committee of Macquarie University (Ref Number: 5201400846), which conforms with the guidelines of the National Health and Medical Research Council (NHMRC) Australian Code for the Responsible Conduct of Research (2007), the National Statement on Ethical Conduct in Human Research (2007) and to other relevant legislation and guidelines.

Signature: _____ **Date:** 24/04/2015

Abstract

This thesis investigates the implementation of Disaster Risk Reduction (DRR) education in Indonesian schools. In the last decade, DRR education programs have been promoted as one of the pillars to save lives and reduce disaster losses, based on several studies that identified positive outcomes. However, most of these studies were undertaken in developed countries. There remain a limited number of studies in developing countries investigating the opportunities and barriers to implementation of DRR education in schools.

The thesis uses a case study approach to explore the scaling-up and sustainability of DRR education in Indonesian schools. Literature relating to DRR education with children and the participation of children in DRR is critically assessed to document the strengths and weaknesses in both fields of study. Based on the review, a new research approach was developed for evaluating the implementation of DRR education programs.

This new approach is used to examine DRR education in Jakarta, Indonesia, a rapidly growing megacity that is highly prone to disasters, especially floods and fire hazards. This study captured the perspectives of children, teachers, and Non-Governmental Organisations on the challenges of scaling-up the implementation of DRR education in schools. The study revealed seven key issues and suggests several strategic recommendations to move forward. These key issues may well be apparent in many other developing and developed countries, and the suggested recommendations may be applicable beyond Indonesia.

Acknowledgements

First, all praise and thanks to God Almighty – Allah SWT. It is with great honour that I present this humble work to those who read it, hoping that God Almighty will help people to benefit from it.

Many people deserve thanks for their contributions to this thesis, the journey of learning and the discovery it entails. First, I would like to express my utmost gratitude to those who participated in this research - the children, school personnel, and NGO colleagues- who provided their wisdom and insights for this research.

I am indebted to my supervisors, Dr. Katharine Haynes, Dr. Deanne K. Bird, and Professor Kevin R. Ronan, for their guidance, patience and insights throughout the research process. I feel incredibly blessed to have these brilliant people in creating such a friendly, supportive, and rich learning environment.

My sincere gratitude to the people who allowed this research to take place in their institutions: the school principal of SDN Kembangan Selatan 1 Pagi, ibu Manawiyah, officials at the Provincial Education Office (Disdik) and Disaster Management Agency of DKI Jakarta (BPBD): ibu Marni, Rahmat Basuki, Etty Kuswata, and Akhmad (of BPBD) and ibu Aulia (of Disdik), friends at Plan: Yusra Tebe, Wahyu Kuncoro, Vanda Lengkong, and Amin Magatani, and also the Consortium for Disaster Education: Arif Nur Kholis and Titi Haryani. Without them, this research would not have been possible.

I also acknowledge the support of UN OCHA on their valuable support during the data collection process. In particular, Titi Moektijasih, Mindaraga Rahardja (Iwan), and Riana Nedyawati (Neda) who were always available at the right time and in the right place.

I am grateful to Risk Frontiers, Macquarie University, and the Bushfire and Natural Hazards Cooperative Research Centre (BNHCRC), from which I obtained scholarships to conduct the research. In particular, I thank Professor John McAneney and Dr. Kevin Roche (of Risk Frontiers), Lyndsey Wright and Vaia Smirneos (of BNHCRC) for their continuous support and assistance whenever required.

I am thankful to Pebi, Hendro, and Ismail, for assisting me in documentation and data entry during the fieldwork and also Wahyu Lubis and Siti Istikanah for their work on transcribing.

Very special thanks to CCDRR colleagues at BNHCRC: Dr. Briony Towers, Dr. Marla Petal, Susan Davie, Nick Ireland, and Barb Kelly for their insightful comments and feedback during important parts of the research.

I am also grateful to Professor Richie Howitt, Dr. Fiona Miller and Dr. Kate Lloyd from Macquarie University for their guidance and advice at the preliminary stages of the research.

Notwithstanding the above, the views expressed in this thesis are my own and I accept full responsibility for any errors or inaccuracies it contains.

I would like to thank Farhana Haque, Darina Nevicka, and Paula Wells from the Admin Department of Environmental Sciences Macquarie University for their crucial assistance during the fieldwork.

Special thanks also to my friends at Risk Frontiers: Felipe Dimer De Oliveira, Carol Robertson, Tetsuya Okada, Emma Phillips, Stuart Mead for the support and friendship. Thank you to Tasmin Dillworth, my fellow adventurer in the world of MRes for always being helpful.

To my family, my mom, da Onang, da Avis, and Yaya, I am deeply grateful for all of your love and support, in good times and bad times.

Last but not least, I could not have pursued this program without the unwavering support of my loving wife, Syifa Andina. She not only willingly moved to Australia with me and scaled down her job, but also provided unconditional support for this undertaking despite the many unknowns that the future held. Thank you for your love and encouragement that you have made. There are not enough words in the world that can describe how fortunate I am.

This thesis is dedicated to my son, Oddie, who is growing up so fast and will soon start formal school in a couple of years time. He is my inspiration and the one that motivates me so that he and his friends can attend school safely.

Table of Contents

List of Abbreviations

ADB	Asian Development Bank
ADPC	Asian Disaster Preparedness Center
BNPB	Indonesian National Disaster Management Agency
BPBD	Provincial Disaster Management Agency
BPS	Statistics Indonesia
CCC coalition	Children in a Changing Climate Coalition
CCDRR	Child-Centred Disaster Risk Reduction
CDE	Consortium for Disaster Education
CDEM	Civil Defence Emergency Management
DRANZSEN	Disaster Resilient Australia New Zealand School Education
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
FGD	Focus Group Discussion
GADRRRES	Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector
HFA	Hyogo Framework for Action
IFRC	International Federation of Red Cross and Red Crescent Societies
INEE	Inter-Agency Network for Education in Emergencies
M	Mean
NGO	Non-Governmental Organisation
Plan	Plan International
PTSD	Post-Traumatic Stress Disorder
PV	Participatory Videos
SAR	Search and Rescue
SCDRR	Safer Community through Disaster Risk Reduction
SD	Standard Deviance
STC	Save the Children
ToT	Training of Trainers
UN	United Nations
UN OCHA	United Nations Office for Coordination of Humanitarian Affairs
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization

UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNISDR	UN International Strategy for Disaster Reduction
US	United States of America
WASH	Water, Sanitation, and Hygiene promotion
WHO	World Health Organization
WVI	World Vision Indonesia

Chapter 1

Introduction

1. 1. Overview

Previous research has demonstrated that when children are supported by adults and are provided with sufficient knowledge and skills they can protect themselves, save others from danger, and promote significant changes in their communities that reduce the risk of disasters (Back et al., 2009; Haynes & Tanner, 2015; Mitchell, T. et al., 2008; Tanner, 2010). Schools have been identified as an effective place for children to build this culture of safety and risk reduction (UN International Strategy for Disaster Reduction or UNISDR, 2008), especially since nine out of 10 children of primary school age are in school (United Nations, 2014).[1] Education and knowledge has always been one of the priorities in the global commitment for DRR, as highlighted in the Hyogo Framework for Action (HFA) 2005-2015 and its successor, the Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2005, 2015c).

Concurrently, there has been an increase in research examining the implementation of DRR education in schools; however, the majority of published studies are based in developed countries (e.g. Falkiner, 2003; Johnson & Ronan, 2014; Johnson et al., 2014c; Ronan et al., 2010). The little research that exists from developing countries mainly exists within the grey literature (see Plan International, 2013; UNESCO & UNICEF, 2012; UNISDR, 2008). This is contradictory to the fact that developing countries are disproportionately impacted by disasters, reflected by the significant number of fatalities and people affected by disasters in the last decade (IFRC, 2014).[2]

The Government of Indonesia has made substantial gains in the integration of DRR into the school curricula and is committed to scale-up teachers' training on DRR education and school preparedness (The Indonesian National Disaster Management Agency or BNPB, 2014b; UNISDR, 2015a). However, there continue to be challenges in its implementation link with sustainability and scaling-up, which is one of the two main issues related to DRR within

[1] Although, it is important to note that there are still a significant number of children (around 58 million children) that are out of school -particularly in sub-Saharan Africa region- and half of them live in conflict-affected areas (United Nations, 2014)

[2] The major disasters of the decade were the Indian Ocean tsunami in 2004 (226,408 deaths), the Haiti earthquake in 2010 (222,570 deaths), Cyclone Nargis in Myanmar in 2008 (138,375 deaths), the Sichuan earthquake in China in 2008 (87,476 deaths), the 2005 Kashmir earthquake (74,648 deaths) and a heatwave in Russia in 2010 (55,736 deaths) (IFRC, 2014, p. 227). The top four occurred in developing countries.

the school curricula internationally (Ronan, 2014).[3] Despite this, no evaluative research exploring these challenges has been conducted within the Indonesian context. Indeed, systematic research in this area globally is limited (Johnson et al., 2014b; Ronan, 2015). In light of this, the broad aim of this research is to identify challenges associated with implementing DRR education in Indonesian schools.

1. 2. Background to this study

The idea for this research was initially generated from my personal experiences as a DRR professional working for Plan International (Plan). Plan is a child focused Non-Governmental Organisation (NGO) with whom I worked in the field of Disaster Risk Management (DRM) between 2006 and 2015. This was also an extremely busy period in terms of disasters, particularly in the South East Asia region and I was deployed to many parts of Indonesia and also overseas responding to floods, cyclones, earthquakes, tsunami, volcanic eruptions and conflict situations.

In 2007, Plan received their first ever grant specifically for Child-Centred Disaster Risk Reduction (CCDRR) project work. Indonesia was selected as part of a handful of countries to pilot CCDRR. At that time, the CCDRR concept was very new for Plan and to other agencies. Therefore, we strived to be innovative and tested new methods and tools, including the use of child-friendly participatory risk assessments, participatory videos, and facilitate children being advocates of DRR from local to international level. During this period, I witnessed first-hand how children can initiate change from the local level through to the international.

Despite the evidence of positive changes, where NGOs were promoting small-scale pilot projects and showcasing good practices, it was obvious that they experienced difficulties and challenges in sustaining and scaling-up CCDRR programs. While this work was commended by various government officials, other NGOs, and CCDRR funding agencies, there was no drive to implement it nation-wide.

This is a recurrent issue for NGOs in implementing grass-root development projects since the 1980s, due to a lack of vision, leadership, incentives, and political will (Hartmann & Linn, 2007). Edwards and Hulme (1995) identified that as programs grow, it is the quality of partnerships between NGOs, communities, governments and donors that will be essential in

[3] The other issue is ensuring that DRR in the curricula actually translates into "ultimate outcomes", including reducing deaths, injuries, and psychosocial consequences during and post emergency phases of a hazard event.

driving development outcomes, sustainability and the process of scaling-up. It is therefore imperative to consider the views of all relevant stakeholders.

1. 3. Aims of the research

The specific aim of this study is to investigate the perspectives of different stakeholders that are directly involved in the implementation of CCDRR programs in Indonesian schools.

In order to identify the key challenges that school personnel face when teaching DRR education in Indonesia, this research builds on an initial study undertaken by Johnson et al. (2014c, hereafter referred as the Johnson study). The Johnson study identified facilitating and deterrent factors for implementing DRR curricula in classroom settings in primary schools in New Zealand. The research presented here focuses on those factors identified in the Johnson study and further adjusted in consideration of the Indonesian context.

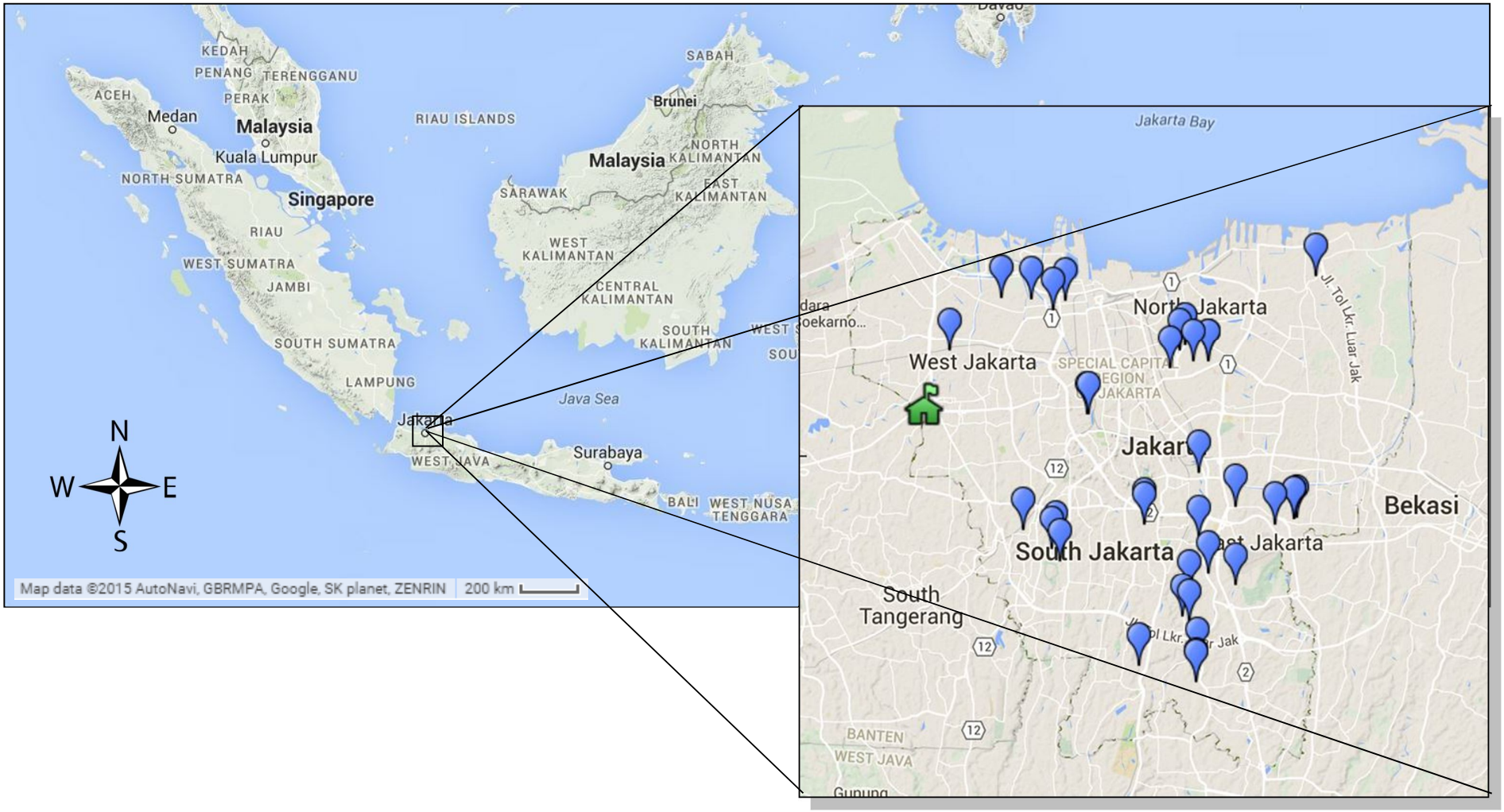
In addition to a focus on the views of school personnel, as in the Johnson study, this study captures the perspectives of children and NGOs. Capturing the views of the children is crucial as they are the main recipients of DRR education. There also remain limited published studies that investigate the role and views of DRR professionals within NGO settings (e.g. Back et al., 2009; Seballos & Tanner, 2011). While some documentation exists, it is limited to the non-peer-reviewed grey literature, such as project reports and case studies (Mitchell, T. et al., 2009). Perspectives from these DRR professionals are important, particularly since NGO-based agencies are the main drivers for advocating and facilitating DRR in many developing countries, including Indonesia (Djalante & Thomalla, 2012).

Based on the findings of this research, recommendations are made to improve the implementation of DRR education within the Indonesian education sector. The following section provides a description on the case study location, which is Jakarta, Indonesia.

1. 4. Case study location: Jakarta, Indonesia

Jakarta is selected as the study location (Figure 1, p. 4) due to a combination of rapid economic growth and urbanisation (Statistics Indonesia or BPS, 2015), a high level of urban poor living in high risk areas (Baker, 2012, p. 213) and a high prevalence of both geological and meteorological hazards producing high vulnerability (Swiss Re, 2014). In addition, Jakarta is one of the cities in Indonesia that has many active DRR programs, being implemented by various government and non-government institutions (Brown & Dodman, 2014; UNISDR, 2012).

Figure 1. Map of Jakarta. Blue pins represent schools that participated in the school personnel survey. The green building symbol represents the school that participated in the student survey. (Image adapted from Scribble Maps ©2015, map data from AutoNAVI, GBRMPA, Google, SK planet, ZENRIN ©2015)



Jakarta enjoys stable economic growth with more than 6% per annum over the last 5 years (BPS, 2015), making it attractive for employment and driving significant in-migration. The greater Jakarta area has a total population of more than 30.5 million, making it the second largest urban area in the world after Tokyo (Demographia, 2015). However, like in other developing countries, this growth has not been balanced with infrastructure and planning. Poor planning, environmental degradation, and corruption have led to sub-standard construction, settlement expansion into marginal lands and riverbanks, and high inequality within the community (Ng et al., 2012; Sagala et al., 2013; Server, 1996; Steinberg, 2007). As a result, Jakarta is becoming increasingly vulnerable to the impact of natural hazards.

Jakarta occupies a low, flat basin of which 40% is below sea level (World Bank (2010) as cited in BPS, 2014). Meanwhile, the northern part of Jakarta lies on a coastline of around 35 km in length, with 13 river systems and two main water canals dissecting the mainland as they drain into the Java Sea. Land subsidence is occurring within Jakarta at a rate of 1-15 cm per year due to extensive ground water extraction, particularly in the northern part of the city, making it highly vulnerable to flooding and extreme high tides (Chaussard et al., 2011).

Based on figures provided by BNPB (2014a), floods in Jakarta have displaced close to one million people from 2002 to 2014. Four major floods occurred within this period resulting in displacement of more than 859,000 people. Floods are exacerbated if heavy rainfall coincides with an extreme high tide, such as that which occurred in 2007 (Sagala et al., 2013). Moreover, children and schools are often significantly affected. For example a post-disaster assessment of the 2013 flood reported that more than 70,000 students from 251 primary schools in Jakarta could not access their school for three to four weeks due to flooding (Education Cluster, 2013).

Jakarta is also prone to fire hazards. From 2009 to 2013, fire incidences in Jakarta have led to 141 deaths, more than three times those caused by floods in the same period, which total 43 (BNPB, 2014a; BPS, 2015). In regards to economic losses, however, floods still cause the biggest impact. For example, the flood in 2014 alone caused economic losses of around 5 trillion rupiah, equal to US$388 million (The Jakarta Post, 2014a). Nevertheless, over the past five years, fires have caused significant losses estimated at 1.2 trillion rupiah, or close to US$100 million (BPS, 2015). If fire risk is not being addressed, it will likely become a much more significant threat to the Jakarta society. The majority of fire incidents in the last 5 years (75%) in Jakarta occurred due to preventable causes, such as faults relating to the electricity

supply and within household electrical appliances (BPS, 2015). Such findings highlight the potential preventability of fire hazards through enhanced awareness on prevention and preparedness.

Currently, the Jakarta administration has made DRR a priority, specifically in terms of developing and implementing technological solutions to prevention and mitigation. This includes the rehabilitation of flood-ways and canals and the planned development of a new dam. Furthermore, their strategy includes social solutions through the development of preparedness plans at the community level (The Jakarta Post, 2012, 2015a, 2015b). However, it appears these measures have not involved children.

Also, as noted earlier, there are many DRR initiatives in Jakarta that are being led by NGOs and multilateral organisations, including the UN, World Bank, ADB, Red Cross, Save the Children, Child Fund, World Vision, Plan International, and Mercy Corps (ADB, 2014; Brown & Dodman, 2014; World Bank, 2014a).

1. 5. Basic education in Indonesia

The Indonesian education system is quite diverse and large in scale. There are more than 50 million students and almost 4 million teachers in more than 269,000 schools, which makes it the third largest education system in the Asia region and the fourth largest in the world (Chang et al., 2013; Ministry of Education and Culture, 2012; World Bank, 2014b). There are three types of schools: public schools and private schools are under supervision of the Ministry of National Education and faith-based schools - mostly Islamic schools - are under supervision of the Ministry of Religious Affairs. More than 80% of the schools are public schools (OECD/Asian Development Bank, 2015).

Based on 2013 figures, nine out of ten Indonesian children are enrolled in primary schools. However, this figure is lower in rural areas which can reach below 60% (World Bank, 2014b). The enrolment for junior secondary school has been steadily climbing to 76.5% in 2013 (OECD/Asian Development Bank, 2015). Based on 2010 figure, the average student enrolled in primary school is 173 students per school and 261 students per school for secondary school (Chang et al., 2013). However, this figure can be much higher in urban areas. Students are required to go to school for 5 days from 7 am until 2 or 3 pm, although this may differ depending on the requirements from each school.

In 2003, the Government of Indonesia decentralised the governance of primary and secondary schools where schools were given the authority to manage their operations

independently with the support from the local community representatives as part of the school committee. This is known as School Based Management. This also includes annual financial support, where the amount is based on the total student enrolment, that the schools and the school committee can flexibly use according to the school priorities (Vernez et al., 2012).

Historically, the style of teaching in Indonesia emphasised repetitive learning and deference to the authority of the teacher. Instead of stimulating children to ask questions, a standard teaching technique was applied through reciting or describing historical events, inhibiting a creative learning environment (Frederick & Worden, 1992).

The enactment of Teacher Law (no.14/2005) triggered changes on the quality of teachers and their employment conditions. Teachers are now transitioned to be certified and professional and those who qualify are entitled to a special professional allowance. All teachers must meet a minimum standard level, which includes a four year degree to attain certification. Those who do not have the four year degree must undertake a 90-hour remedial in-service course (Chang et al., 2013). This course aims to stimulate teachers' professional development and improve their teaching capacity.

Aligned with the decentralisation of school governance, in 2006, Indonesia also implemented a decentralised and competency-based curriculum. Curriculum guidelines are produced by the Curriculum Centre, a unit under the Ministry of National Education. However, schools have the autonomy to develop their own syllabus and learning materials and develop an independent, operational curriculum (Sulfasyah, 2013).

1. 6. Thesis outline

The thesis is comprised of 6 chapters. Chapter 2 provides a critically analysis of existing literature on CCDRR, including the concepts, theories, and methodologies over the last two decades that have shaped the practices and research on children's involvement in DRR. In doing so, it is able to identify a suitable methodological framework upon which an investigation into the barriers and challenges of DRR education can be based.

Chapter 3 presents the research methods that were employed to collect and analyse the data. It describes the critical realist approach that underpins this study, outlines the different stages of data collection, presents the rationale for each method utilised, and provides a description of the grounded theory approach used for analysing findings from NGOs.

In Chapter 5, the results from the fieldwork are outlined. The results are presented from each stakeholder individually in order to clearly outline their views on the practice of DRR education and its barriers and challenges.

In Chapter 6, the research results are discussed in relation to the conceptual framework and literature reviewed in chapter 2. Key issues on the barriers and challenges of DRR education are identified, critically analysed and recommendations are made. The thesis concludes with a summary of the key findings and the areas of future research on CCDRR.

Chapter 2

Literature Review

2. 1. Preface

This literature review provides an overview on the existing studies and practices related to children and disasters, and more specifically on CCDRR. The overall aim is to provide a critical analysis to highlight progress, gaps, and challenges related to studies on the application of child-centred methods in the area of DRR.

The majority of these articles were sourced from keyword (i.e. children and disasters) searches in relevant scientific literature databases (e.g. Google Scholar, Springer, Science Direct, and Wiley Online Library). References in these articles then generated access to additional sources.

This review starts with the definitions of CCDRR and continues with an overview of disasters and demographics. The following section describes the impact of disasters on children and looks more closely at their vulnerabilities. The review then describes the progress of CCDRR research, primarily on DRR education and children's participation in DRR. Subsequently, the application of various methods applied in CCDRR research is explained. In the last section, conclusions are drawn that influence the later stages of the research.

2. 2. Definitions of Child-Centred Disaster Risk Reduction

While various terms have been used to reflect the participation of children in DRR, such as *child-focused* and *child-led* DRR, the term CCDRR will be used here to reflect a commitment to values linked to both the protection of children's rights and their participation.

In this thesis, the CCDRR approach is defined as disaster risk reduction measures *for* and *with* children, involving children, parents, communities, service providers, and governments (UNICEF, 2014a). The approach is a combination of *child-participation, including at times child-led,* which reflects engaging children directly in the design and delivery of DRR activities in their homes, schools, and communities, and *child-focused* which acknowledges the specific needs of children during the design and implementation, including protection needs and rights (Back et al., 2009; Mitchell, T. et al., 2009).

Thus, there are two primary objectives in CCDRR: to recognise and address the specific vulnerabilities of children to disaster risks; and, to empower children by strengthening their skills and creating an enabling environment for them so that they are able to play an

increasingly active role in community efforts to reduce the risks and impacts of potential disasters (Plan International, 2010b; Towers et al., 2014).

2. 3. Disasters and demography: The changing landscape

Between 2003 and 2012, there were more than 4,000 disaster events worldwide (EMDAT, 2014). Fatalities from natural hazards events appear to be declining, particularly in weather-related events with the merit being attributed to better preparedness, early warnings, and improved response (UNISDR, 2014). However, the number of people exposed to natural hazard events has increased significantly. Using the EMDAT (2014) and UN Populations Divisions (2013) data, between 1943 and 1952, less than 1% of the world population was affected by disasters. Meanwhile, six decades later, disasters have affected more than 29% of the world population, showing an almost 30 times increase.

The world today faces other global challenges including population growth, unplanned urbanisation, environmental mismanagement and loss of biodiversity, socio-economic inequities, poverty and short-term economic vision (UNISDR, 2004). All of these factors exacerbate the severity of disaster impacts, especially to children as the most vulnerable group. Besides the physical risks of fatality, illness, and injury brought about by disasters, children are also prone to psychological impacts and disasters often restrict their education, and thus influence their personal growth and development (Peek, 2008). These issues are discussed in the following sections.

2. 4. Impact of disasters to children

2. 4.1. Physical vulnerability

WHO (2011) estimates that 30-50% of fatalities arising from natural hazard events are children. For example, most fatalities and people affected by the 2004 Indian Ocean Tsunami were women and children (Telford et al., 2006). Nishikiori et al. (2006) revealed that in the tsunami affected regions of Sri Lanka, child mortality was three to four times that of young adults and young children (under the age of 5 years) double the number of adults over 50 years of age (see also Zahran et al., 2008). The high number of fatalities among women and children was because they were likely to be indoors when the tsunami came (Nishikiori et al., 2006).

Children are more likely to be injured, unable to access critical humanitarian assistance such as food and health care and are more exposed to greater danger because of separation from their families or caregivers (Peek, 2008). Furthermore, families that are affected by disasters

have an increased likelihood of domestic violence (Bonnerjea, 1994; Enarson, 1999; Sety, 2012). Children are also prone to abuse and sexual exploitation in crisis situation (Csáky, 2008; UNHCR & Save the Children, 2002).

2. 4.2. Psychological vulnerability

The most comprehensive review to date, including 60,000 victims of disasters across demographic groups, shows that children are the most vulnerable group psychologically (Norris et al., 2002). This is because children are highly susceptible to developmental damage with disaster impacts affecting their characters and causing detrimental impacts on their future (i.e. troubling life outcomes) (Lauten & Lietz, 2008).

In the aftermath of disaster, children can develop symptoms of Post-Traumatic Stress Disorder (PTSD), depression, anxiety, emotional distress, sleep disorders, somatic complaints and behavioural problems (Norris et al., 2002). Among child survivors of the 2008 Wenchuan earthquake, more than one in five were identified as having PTSD or depression and their well-being was deeply affected (Jia et al., 2010). Children that are affected by disaster can also develop intense fears to the same or other disasters as described by Burnham et al. (2008) in their research after Hurricane Katrina. Studies also show that (natural or human-induced) disasters are among the eight most feared situations across children between the age 8-17 years old (Ollendick, 1983; Ollendick et al., 1985). These hazard-related fears also exist in children who have experienced and also those who have not experienced disasters (Burnham et al., 2008).

2. 4.3. Impact of disasters on children's education

Post disaster assessment reports showed that when disaster strikes, significant numbers of schools are often damaged, and books and education records are lost or destroyed decreasing the quality of services for the children (International Recovery Platform, 2014; Sinclair, 2001). A further issue in this context is that if buildings are not damaged, schools will often serve as temporary shelters for displaced people where they remain until they can go back safely back to their settlements, thus further complicating educational continuity (Sinclair, 2001). Children who are displaced by disaster and consequently miss schooling, experience academic setbacks and show signs of withdrawal (Johnson & Ronan, 2014; Pane et al., 2008; Redlener et al., 2010).

Regular, small and medium scale disasters exacerbate the school dropout rate, preventing children from gaining life-sustaining and life-saving knowledge and skills (INEE, 2010; Plan

International, 2012b; Ronan, 2014). For example, the student drop-out rate in flood-prone areas in Cambodia is 22% higher compared with the national average (ADPC, 2008).

Despite the abovementioned facts, there is still very little research that assesses the impact of disasters on children's education performances, including the long-term effects (e.g. Redlener et al., 2010). There is also a dearth of studies that assess the effectiveness of implementing DRR-related measures in education institution (e.g. schools) prior to disasters and the role of these measures in promoting educational continuity, children's and teachers' wellbeing and other outcomes.

2. 4.4. Children as agents of change

The latest report by UNICEF (2014b) showed that in 2012, there were more than 2.2 billion children[4] in a total world population of approximately 7 billion. That is, nearly one-third of today's population are children. This is a significant change compared to 20 years ago, when children made up less than a quarter of the world's population (UNICEF, 1996).

In general, children are regarded as a broad vulnerable group and often combined with women, the disabled, and elderly, and sometimes indigenous people in the DRR policy and strategy documents at the global to local levels (Mitchell, P. & Borchard, 2014; Peek, 2008). If we use this broad paradigm, looking at every child the same way, we fail to take into account *what* makes a child vulnerable and what they are vulnerable to. Most importantly, children are not gender neutral and boys and girls have different capacities and vulnerabilities (Haynes et al., 2010; Plan International, 2011).

Vulnerability is defined as "*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 a natural hazard"* (Wisner et al., 2004, p. 11). There are various characteristics that influence children's capacity and vulnerability in a society including age, gender, beliefs, culture, race, and family structure, with each factor effecting capacity and vulnerability (positively or negatively) in different ways (Lopez et al., 2012; Peek & Fothergill, 2014).

For example, children in different age groups and contexts have distinct characteristics, strengths and weaknesses. Moreover, not all children are more vulnerable than all adults.

[4] As defined by United Nations, a child is a person under the age of 18

2. 5. Child-centred disaster risk reduction

In some cases, children may be more resilient than adults (Bartlett, 2008). Unfortunately disaster management practices remain dominated by programs and strategies targeted at adults where children are seen as passive victims with a limited role to play (Mitchell, T. et al., 2008; US National Commission on Children and Disasters, 2010).

In spite of this, advancements have been made in building the evidences on the benefits of involving children in DRR (e.g. Haynes et al., 2010; Haynes & Tanner, 2015; Mitchell, T. et al., 2008; Save the Children, 2008; Tanner, 2010; UNICEF, 2012). These publications challenge common misperceptions that children are passive victims with a limited role to play. Rather they support the notion that when children are capacitated and supported by adults through CCDRR, children can be better prepared to protect themselves, others, and also generate significant changes among their family and within their communities (as shown in Back et al., 2009; UNISDR & Plan International, 2012).

As the practice of CCDRR grows, there has been an associated increase of research in this sector. The focus of these studies has started to diverge into two main bodies of investigation and knowledge: 1) the integration of DRR into the education sectors; and, 2) children's participation in DRR. The progress made in both fields is discussed in the following sections.

2. 5.1. DRR education studies: progress so far

Substantial efforts have been made to integrate DRR in the education sector (Ronan, 2014). This was especially the case since the global campaign on "Disaster Risk Reduction Begins at School" led by UNISDR (2015b).For example, an online database in PreventionWeb (2015) holds more than 2,000 items on disaster education including playbooks, training modules, guidelines, and teaching materials targeting a variety of audiences including children, teachers, facilitators, and government officials in various languages. In the 2013 Global Assessment Report, 72% of reporting countries specified that DRR had been integrated in their national education curriculum (Ronan, 2014). It was also noted that, despite capacity and resource limitation, progress has been made in integrating DRR education at the institutional level (ibid).

Even though there is a bulk of education materials and many efforts are being done to promote disaster education in schools, there seems to be a lack of comprehensive and systematic evaluation on the outcomes and impacts of these programs (Ronan, 2014;

UNESCO & UNICEF, 2012). Most studies evaluating DRR education are of a one-off, ad-hoc nature conducted by NGOs or academia rather than led by the government agencies (Johnson et al., 2014b; Ronan, 2014).

However, Johnson et al. (2014b) conducted an overview of research in this field which included a broad and systematic review of 35 studies that evaluated DRR education for children. Johnson et al. (2014b) identified that DRR education has provided positive outcomes for children, in relation to preparedness. For example, a series of correlational and quasi-experimental studies on DRR education in New Zealand identified that children who had been exposed to a DRR education program had better knowledge, reduced levels of hazard-related fears, and more stable risk-perceptions (Finnis et al., 2010; Ronan et al., 2010; Ronan & Johnston, 2001, 2003; Ronan et al., 2001).

Shaw et al. (2004) draws the same conclusion that DRR education in schools can provide benefits to children, noting as well that self-learning and education induced from family and community also play an important part in enhancing disaster preparedness behaviour and practices. Other studies have also investigated the link between DRR education programs with preparedness at homes (Finnis et al., 2010; Ronan et al., 2010; Ronan et al., 2012). These studies found that adjustments for better preparedness were made, however, the level of adjustments were minor.

Based on focus group discussions with New Zealand teachers, Johnson et al. (2014c) identified eight facilitating and eight deterrent factors that influences teachers to use DRR education material "What's the Plan, Stan?" (Table 1).

Table 1. Facilitating and deterrent factors to use of "What's the Plan, Stan?"

Facilitating Factors	**Deterrent Factors**
School-wide use of the resource	Voluntary nature
Promotion of the resource by teachers	Lack of awareness of the DRR education resource
Direct engagement with local CDEM[5] staff	Perception that training is needed for its use
Teacher's interest in the subject	Lack of school-wide use
Student's interest in the subject	Lack of relevancy when no disaster occurred
Good-quality design	Incompatibility with teaching methods
Recent disaster	Competing extracurricular topics
Teachers' training	Lack of direct engagement with local CDEM staff

[5] CDEM is New Zealand's Civil Defence and Emergency Management office

These findings reinforce previous studies identifying factors that influence the implementation of DRR education, which are: the quality of DRR education materials, availability of teaching aids (e.g. videos and brochures), time constraints, engagement with subject matter experts, and exposure to previous disasters (Falkiner, 2003); the use of interactive teaching aids (e.g. glove puppets and songs), interactive learning methodology (i.e. role playing), teachers' training, regular practice through drills and workshops among teachers (Izadkhah & Heshmati, 2007); involvement of subject matter experts, quality of materials, and involvement of community and student's family were influencing the outcomes of DRR education (Shiwaku et al., 2007); and integration with other subjects in the curriculum and practicing drills regularly (Johnston, David et al., 2011).

2. 5.2. Children participation on DRR: progress so far

This field of study focuses on enabling children to be positive change makers in their communities through participation in DRR. The prominent literature in this field consists of reports and case studies produced by child-focused NGOs (Mitchell, T. et al., 2009). For example, UNISDR and Plan International (2012) documented stories made by children in seven Asian countries illustrating children's role in addressing disaster risk and the impact of climate change and advocating for governments, NGOs and private sectors to promote DRR.

Furthermore, there has been an attempt to strengthen CCDRR programming by forming coalitions with academic institutions such as the Children in a Changing Climate (CCC)[6] Coalition to foster collaboration between academics and practitioners. A series of peer-reviewed and non-peer-reviewed studies focusing on children's participation in DRR have been published from this coalition. Findings of these studies are discussed next.

Molina et al. (2009) conducted action research in the Philippines on the application of child-friendly tools and described the key steps to using them. The tools were effective in capturing unique perspectives of children compared with adults (see also Seballos & Tanner, 2009; Tanner et al., 2009). For example, the children identified non-environmentally friendly livelihood practices, poor waste management, social hazards (gambling, drugs, and community conflict), health and disease, and global environmental problems. These hazards were not identified by adults, especially men (Tanner et al., 2009). Some of these tools were later documented in Plan International's CCDRR toolkit (2010a).

[6] The Children in a Changing Climate Coalition was formed 'to lead child-focused research, development and humanitarian organisations, each with a commitment to share knowledge, co-ordinate their actions and to work with children as protagonists rather than just as victims' (Gautam & Oswald, 2008, p. 7). The coalition includes the Institute of Development Studies, Plan International, Save the Children, UNICEF, and World Vision.

Tanner et al. (2009) documented case studies of children taking action on DRR from communities in El Salvador and the Philippines, including protecting schools from floods, mangrove restoration, hurricane preparedness, flood and river erosion prevention, and campaigning against illegal mining. Based on the CCDRR work in these two countries, Tanner (2010) then identifies four distinct roles of children in relation to DRR, which are unique risk identifiers -as noted earlier by Tanner et al. (2009)-, risk communicators, community mobilisers, and agents of change. Subsequently, Haynes et al. (2010) conducted action research in Indonesia assessing the influence of gender and religion and found unique differences between adult men and women with boys and girls when they rank and identify the risks and actions needed to address them.

Haynes and Tanner (2015) tested the use of participatory videos (PV) made by children in the Philippines in 2009 and identified that PV is an effective tool in motivating children to undertake research of their own, communicating children's views, concerns, and ideas to policy makers and the wider community, and ultimately empowering children as advocators. This method was also used by Gautam and Oswald (2008) in Nepal to capture the views of children on the impacts of climate change and generate recommendations for policy makers. However, Plush (2009) illustrates several barriers of PV, including familiarity of the people with the subjects that they want to raise, power relations within the community, and technological issues. Nevertheless, PV continues to be used in CCDRR by Plan International in Vietnam and Indonesia.[7]

A more comprehensive publication examining children's action on DRR in 12 countries to bring change to their communities are documented by Back et al. (2009). The study reinforces previous findings of CCDRR where with sufficient knowledge and support by adults, children are able to deliver a strong voice and take action to influence and transform communities from the grass-root level up to the international stage.

In 2011, the CCC coalition facilitated the creation of the Children's Charter for DRR which was launched at the 2011 Global Platform for DRR (Children in a Changing Climate, 2011). The charter consists of an action plan towards five key priorities for DRR: safe schools, child protection, access to information and participation, safe community infrastructure, and reaching the most vulnerable. Two years after the launch, the CCC coalition generated a

[7] Documentation of PVs are available at http://plan-international.org/where-we-work/asia/case-studies/children2019s-films-educate-communities-about-disaster-risks/ [Retrieved on 18 April 2015]

report showing that progress had been made on all five key priorities, but there needs to be more efforts (Bild & Ibrahim, 2013).

The CCC coalition appeared to be producing mutual benefits: academic institutions were given access to NGOs projects at the grass root level, and in return academic publications built the evidence needed to support the advocacy efforts of the NGOs. Unfortunately, this type of collaboration is not common and as such the number of publications in this field remains very limited.

There are, however, several papers borne outside this coalition that are relevant to CCDRR, including Mitchell, T. et al. (2008) described the unique role of children in communicating risks in El Salvador and New Orleans. Brown and Dodman (2014) investigating CCDRR in four Asian cities and found that street children, working children and children living in poor settlements are more vulnerable to environmental hazards, disasters and climate change. Meanwhile, Mitchell, P. and Borchard (2014) delivered arguments on mainstreaming children's needs and capacities into community-based adaptation.

Towers et al. (2014) examined the progress of CCDRR in Australia highlighting that whilst there is a positive effect of DRR education on children that are exposed to the program, there is a need to have supporting policies, services and practices in the disaster management sector to enable children to be agents of change. In addition, a study in the Philippines by Fernandez and Shaw (2015) identified that the presence of supportive institutions such as science clubs can become a catalysts for children to disseminate knowledge on DRR.

2. 6. Comparison between studies on DRR education and children's participation

There is a clear link between the two fields of study. Studies of children's participation in DRR identified that, with the right knowledge, skills, and support, children can bring change to their society and promote resilience (as shown in Back et al., 2009; Haynes & Tanner, 2015; Mitchell, T. et al., 2008). Meanwhile, studies have demonstrated that DRR education programs have been proven to increase children's knowledge and skills in DRR, making it a key element towards children's participation in DRR.

Seeing that there are two bodies of investigation and knowledge, a comparative review on DRR education and children's participation studies was undertaken. Relevant papers on children's participation in DRR that were previously highlighted were included in this

comparison study. Other papers related to CCDRR were omitted because they were replicates of the aforementioned papers or due to a lack of information on the research methodologies applied within the study. Studies on DRR education were compiled using the list of papers that was used by Johnson et al. (2014b), omitting only those which were unpublished studies and internal reports. Overall, 43 studies were examined (Table 2) using the following five parameters for comparison: research design, data collection tools, research locations, research participants, and findings).

Table 2. A review of 43 CCDRR studies and the nature of the research design and its methodologies (Back et al., 2009; Black & Powell, 2012; Brown & Dodman, 2014; Buchanan et al., 2009; Clerveaux, Virginia et al., 2010; Coomer et al., 2008; Falkiner, 2003; Fernandez & Shaw, 2015; Finnis et al., 2010; Frau et al., 1992; Gaillard & Pangilinan, 2010; Gautam & Oswald, 2008; Gulay, 2010; Haynes et al., 2010; Haynes & Tanner, 2015; Hilyard et al., 2011; Izadkhah & Heshmati, 2007; Jang et al., 2011; Johnson, 2011; Johnson et al., 2014a; Johnston, D et al., 2006; Kurita et al., 2006; Mitchell, T. et al., 2008; Molina et al., 2009; Naya, 2007; Plush, 2009; Powell et al., 2011; Ronan et al., 2010; Ronan et al., 2012; Ronan & Johnston, 2001; Ronan et al., 2001; Shaw et al., 2004; Shiwaku & Shaw, 2008; Shiwaku et al., 2007; Smith, 2011; Tanner, 2010; Towers, 2015; Towers et al., 2014; TR Ministry of Education et al., n.d.; Wachtendorf et al., 2008)

	DRR education studies	Children's participation in DRR studies	Total
Research locations			
Developing countries	8	10	18
Developed countries	24	1	25
Research participants			
Children	27	11	38
School personnel	8	2	10
Parents	4	4	8
Public officials	1	6	7
Wider community	2	4	6
NGO	0	4	4
Findings			
Positive	21	10	31
Mixed	5	0	5
No effect	4	0	4
Not conclusive	2	1	3
Research design			
Qualitative	5	10	15
Quantitative	20	1	21
Mixed methods	7	0	7
Data collection tools			
Focus groups	2	5	7
Interviews	5	6	11
Observations	4	2	6
PVA	0	4	4
Questionnaire	27	1	28
Content reviews	0	0	0
Participatory video	2	1	3

The review revealed that there are distinct differences between the two fields of study. The following sections provide detail on each parameter, with research design and data collection tools grouped together.

2. 6.1. Research locations

Most of the studies on DRR education were undertaken in developed countries, with the majority in the United States of America (US) (11 studies) and New Zealand (8). Only 6 developing countries were involved in these studies: Turkey, Sri Lanka, Iran, Nepal, the Grenadines, and the Philippines. However, nearly all the studies on children's participation in DRR were undertaken in developing countries. This reflects the influence of NGO's in developing countries and their agenda to conduct bottom up participatory research.

In general though, studies on children's participation in DRR are very limited compared with studies on DRR education or other studies related to children and disasters. It is therefore safe to assume that more studies on this topic are needed in order to understand the best way to actively involved children in DRR. In addition, a higher emphasis should be stressed for DRR education studies to be undertaken in developing countries. Similarly, more studies on children's participation in DRR should be undertaken in developed countries.

2. 6.2. Research participants

Most studies on DRR education only involved students and teachers. From 32 studies, only four evaluations included parents, two studies involved the general public (adults), one included public officials as participants, while none included NGOs as research participants. This shows that the literature examining the implementation of DRR education is dominated by the interaction between teachers and students.

In contrast, studies on child participation in DRR involved a wide range of stakeholders, capturing the views of parents, community leaders, government officials, and NGOs. The findings from these studies illustrate that adults' involvement is essential for children to turn knowledge they received in schools (or other institutions) into everyday practice. More specifically, parent's roles are essential in applying DRR education at home, providing consent for children to participate in activities at schools and local communities, and also providing support and validation of the activity within the community (Haynes et al., 2010; Seballos & Tanner, 2011; Towers et al., 2014).

The influence of gender, religion and age groups has also been assessed in studies on child participation in DRR (such as Haynes et al., 2010; Haynes & Tanner, 2015). However, these aspects, which are considered important factors in terms of their influence on children's vulnerabilities and capacities (Lopez et al., 2012; Peek & Fothergill, 2014), have not been thoroughly analysed in DRR education studies (Johnson et al., 2014b).

On this aspect, DRR education studies should include participants other than teachers and students, such as parents and government stakeholders (i.e. disaster management agencies and the education sector). These stakeholders are important in influencing children's vulnerabilities and assisting children to take action in reducing risks in their communities (Towers et al., 2014). Assessing the underlying factors that influence children's vulnerabilities would enable DRR education to be better grounded and targeted, improving its effectiveness.

2. 6.3. Research findings

Evaluations on DRR education show a mix of results, 26 out of 32 studies indicate a somewhat positive impact of DRR education for children and teachers. Meanwhile, the other six showed no effect (4 studies) or inconclusive results (2 studies). There is strong evidence of greater awareness, increased knowledge and skills, and increased confidence and positive mental state (e.g. reduce fear and anxiety) as a result of DRR education. However, there is little evidence that this intervention enables children to reduce disaster risks within their communities.

This is in line with the analysis of Towers et al. (2014) that DRR education alone will not be able to bring significant change to the community. For this to occur, children require more than education and must be supported with policies and resources, including support from relevant authorities.

All but one of the studies on child participation in DRR documented a positive impact of CCDRR intervention at different levels (local, national, and international). For example, with the help of a local politician, a group of children in the Philippines were successful in campaigning to their community to relocate a school prone to landslides to a safer area (Back et al., 2009). At the national level, children's voices that were captured through PV influenced the national action plan for climate change adaptation in Nepal (Gautam & Oswald, 2008). Furthermore, a group of children who participated in the 2007 13th UN Climate Change Conference and the 2009 Global Platform for DRR, influenced the documented outcomes from those events (Back et al., 2009)

The one study that did not show any impact was an initial assessment of urban children in four cities in Asia (Brown & Dodman, 2014). Nevertheless, it generated recommendations for CCDRR programming (ibid).

2. 6.4. Research design and data collection tools

Of the studies reviewed on DRR education, 20 employed quantitative analysis. Seven utilised a mixed method approach and five used a qualitative only approach. There is a strong preference (27 from 32 studies) in using quantitative methods for the collection of data on DRR education (e.g. using questionnaires).

Questionnaires have the advantage of gathering information from large groups and it is usually quicker and simpler to analyse numerical data compared with qualitative data (Bell, 2007). However, this tool cannot gather in-depth data in relation to the effectiveness of the process and has limitation in assessing children's learning, particularly for young participants (Johnson et al., 2014b). This method also restricts participants' responses to those listed by researchers, it does not allow the collection of data otherwise important to the participants or data relating to wider issues at play, such as underlying vulnerabilities.

This is significantly different to studies on children's participation in DRR, with all studies except one applying a qualitative research design. Among these, a variety of participatory data collection tools were used and some were adjusted to be more child-friendly in order to engage children to express their views and concerns (Molina et al., 2009). The use of focus groups and interviews were popular in these studies. These methods are useful to explore participants' knowledge and experiences and reasons for their views and opinions (Kitzinger, 1995; Kvale, 2007). Focus group discussions in particular are considered to be more cost effective in collecting large amounts of qualitative data in a relatively short period of time (Parker & Tritter, 2006).

Three studies highlighted the use of PV as a powerful tool for documenting children's perspectives and communicating them to the wider community (Gautam & Oswald, 2008; Haynes & Tanner, 2015). However, these studies also noted the limitations of PV and warned that intensive preparation is needed (Plush, 2009). The ethnographic method of participant observation was used in a New Orleans case study enabling the researcher to see the world through the eyes of the participants and provided the researcher a more complete understanding on situations surrounding the affected youth minority in a Vietnamese community (Mitchell, T. et al., 2008).

The studies on children's participation in DRR were mainly undertaken in collaboration with NGOs and almost all used qualitative methods. One criticism of this approach is that the researcher can become subjectively immersed in the subject matter, especially with

ethnographic method (Miles & Huberman, 1994). Therefore care must be taken with data collection and analysis and all potential biases avoided, and if any, explained. However, it must be noted that even quantitative methods can be open to subjective bias and no methods or analysis are considered to be totally objective (Phillips, 1990).

Child participation studies have used a descriptive research design, which often takes place as a one-off event, and sometimes conducted after the research participants are involved in CCDRR intervention. None of the studies reviewed here included a control group who were not exposed to the intervention, in their investigation. This makes it difficult to critically and rigorously determine the effectiveness of CCDRR programs. In comparison, 22 studies on DRR education have used quasi-experimental and experimental methods (Johnson et al., 2014b). These methods enable them to provide a comparison between different groups, either before and after interventions or with control groups.

2. 7. Closing notes

Disaster management programming and strategies remain dominated by adults and children remains seen as one of the vulnerable groups in a disaster. However, research has demonstrated that if they are provided with the right knowledge and tools and are supported by adults, children can deliver significant change for themselves and their communities. This notion is important as nearly one-third of the world's population are children and the strategies implemented today have the potential to deliver long-term impacts to today's children.

Research on children and disasters mainly comprise of three main themes: the impact of disasters to children, DRR education, and children's participation in DRR. Over the last decade, the two latter themes have started to gain popularity and there has been an increased number of papers published in these fields. However, studies on children's participation in DRR remains small in number compared to other studies on children and disasters.

Notably, several of the papers on children's participation in DRR were published as a result of collaborations between NGOs and academia. From this perspective, new tools and approaches have emerged in CCDRR practices and evidence on the impact of children's participation documented. Due to these positive outcomes, this type of collaboration should be maintained and replicated to deliver more positive outcomes for children that are conducted directly with those who deliver a large percentage of the programs, e.g. NGOs.

2. 7.1. Implication of the literature review to the research

The comparison between studies on DRR education and child participation in DRR has shown a number of positive and negative factors on both sides. Qualitative studies provide in-depth investigations on the barriers and challenges in children's participation in DRR, including capturing the views from a wide range of stakeholders. Meanwhile, quantitative studies are able to capture information from a larger group of participants and are relatively easier to replicate for comparisons. Developed countries would benefit learning from the studies on children's participation in DRR, particularly turning knowledge and skills received from DRR education into practice. In the meantime, developing countries would gain advantage from learning lessons from developed countries on how to increase the effectiveness of DRR education.

Significant benefits could be gained by combining the methods in order to investigate how DRR education can promote positive behaviour on DRR and consequently enhance children's participation in DRR in schools, at homes, and their surrounding community.

Therefore, in order to advance this area of research, a mixed methods approach is applied here. As demonstrated, qualitative methods have been used to gain a detailed understanding of a previously un-researched area. This study extends this analysis through a quantitative exploration in order to capture the perspectives of a wider sample of children. In addition, the views of teachers and NGOs are also captured. The Johnson study has identified factors influencing teachers in implementing DRR education. Hence, these findings are being further tested and developed in the Indonesian context.

Although the views of parents and government agencies are also considered important, the time constraints of this Master of Research study limited the number of participants who could be involved. This is discussed later in section 6.1.

Chapter 3

Methodology

3.1. Study Design

This study used a multi informant, mixed method sequential approach, focusing on three distinct samples: school personnel, DRR professionals within child-focused NGO's working in Jakarta and children. Previous studies have captured the views of children (Back et al., 2009; Tanner, 2010), teachers and other school personnel (Buchanan et al., 2009; Johnson & Ronan, 2014; Shiwaku et al., 2006), and NGOs (Djalante & Thomalla, 2012). However, there are very few studies that combined the perspectives of all these stakeholder groups, especially none in the field of DRR education.

Different research methods were applied based on the level of previous research and to suit the different research participants. In the first stage, information from school personnel was collected through the use of a structured questionnaire. The Johnson study used focus groups to identify facilitating and deterring factors on implementing DRR education in classroom settings. Thus, the questionnaire method was used to test these factors in the Indonesian context among a group of participants. Previous studies on DRR education have also used questionnaires as the preferred way to measure risk perspectives, knowledge and views of teachers and students (Johnson et al., 2014b).

The second stage consisted of a focus group discussion (FGD) with staff from child-focused NGOs. There have been very few references that have captured the views and opinions of NGOs, specifically on DRR education. Thus, an FGD approach was considered as the best way to explore the issues in-depth and enable further clarification if needed (Kitzinger, 1995; Parker & Tritter, 2006). In addition, as part of the sequential nature of the design, some of the discussions in the FGD were guided from the findings of the school personnel survey, specifically on the implementation of DRR education.

The final stage captured the children's opinions. Past studies have documented evidence on children's fears towards disasters (Burnham et al., 2008; Ollendick, 1983; Ollendick et al., 1985), their unique way in identifying and understanding risk (Haynes & Tanner, 2015; Mitchell, T. et al., 2009), and their interest in DRR (Back et al., 2009; UNISDR & Plan International, 2012). Therefore, given the range of previous findings, the questionnaire method was used to measure relevant hypotheses among a large group of children. In addition, a questionnaire approach has been shown to be a useful tool to garner information

from children who might be afraid or shy to speak during in an interview or focus group setting (Gallagher, 2009). Initial findings from previous stages (e.g. role of children in DRR, source of DRR education, and interests of children in DRR) influenced the design of the children's questionnaire.

A critical realist approach is used in this study. The overall analysis used a thematic focus, stressing the pursuit of a better understanding of the underlying problems. Although it is acknowledged that the root drivers are influenced by structures in society which may not be measurable, but contain the mechanisms that guide the events (Emmel, 2013; Sayer, 1992; Watts, 2006).

The research was completed between late November 2014 and mid-January 2015. Each stage of the research is discussed in detail in the following sections.

3.2. Stage 1: Primary school personnel questionnaire

3.2.1. Participants and procedure

A total of 44 members of staff from 39 flood prone Jakarta primary schools completed the questionnaire (Figure 1, p. 4). This included seven school principals, 34 teachers, and one administrator. Two people did not state their positions. Participants included 22 females and 22 males, whose age ranged from 22 to 59 years (*M = 43.71, SD = 11.23*).

These schools were selected as flood-prone schools identified by the Provincial Disaster Management Agency (BPBD) of Jakarta and were invited to attend a three-day training course on Child-Friendly Disaster Management for primary school teachers. All participants that attended the course agreed to take part in the survey, which was implemented once the training had been completed (see procedure section for further detail). The school personnel were from schools ranging from 107 to 500 students with an average of 273 students per school. The exception here was one school principal who managed two schools with a combined enrolment of 900 pupils. Based on the discussions during the training, it became clear that all of the school personnel had experience of disaster events, particularly floods.

3.2.2. Materials

The school personnel questionnaire was adapted from CCDRR theory and research, including findings from previous studies (Table 3) and then adjusted for the Indonesian context. Items were designed by a combination of parameters that have been identified empirically (e.g. facilitating and deterrent factors, children's participation in DRR) and through deductive,

theory-based means (i.e. expert consensus), and based on existing test construction theory and guidelines (Kline, 2013). It also includes globally recognized frameworks such as UN Conventions for the Rights of Children (1989), Hyogo Framework for Action (2005), and Comprehensive School Safety Framework (2014). A similar approach was also used in designing the children's questionnaire.

Table 3. Description of the school personnel questionnaire (a copy of the questionnaire is provided in Appendix A)

No.	Parameters	Indicators	Type of responses	Sources
1.	Demographic variables	Age, gender, profession, school name, school address, number of students, teachers, and school staff	Short-answer	
2.	Child participation in DRR	Role of children in disaster preparedness at different environments; influence of DRR activities on children; confidence in involving children in DRR.	7-point Likert Scale (Strongly Disagree to Strongly Agree)	Tanner (2010); United Nations (1989)
3.	DRR-related activities in schools	Type of subjects that are useful for children; Type of DRR-related activities; Perceived usefulness of the DRR-related activities	Multiple options Yes/No	GADRRRES and UNISDR (2014); Johnson et al. (2014c)
4.	Involvement of external stakeholders	Stakeholder mapping for DRR education Degree of coordination between school and local council and disaster management agency	Multiple options 7-point Likert scale (No Coordination to Strong Coordination)	Johnson et al. (2014c)
6.	Facilitating and deterrent factors on DRR education	Factors influencing teachers in implementing DRR education	Multiple options	Johnson et al. (2014c);
7.	Teachers' training	Types of training	Multiple options	Johnson et al. (2014c, p. 39), UNESCO and UNICEF (2012)
8.	School readiness for disasters	Degree of readiness for disasters	7-point Likert scale (Not At All to Highly Ready)	Whittaker and Handmer (2010)
9.	Role of children in contingency planning process	Degree that children are involved in each step of contingency planning process	Multiple options	BNPB (2013), Save the Children (2007a)

Different types of responses were used, and where appropriate, options of "I don't know" and/or "Other, please specify" were added in order to not restrict participants to the predefined options (Bird, 2009). The questionnaire was pre-tested with several academic colleagues experienced in this field.

Five parameters that dealt specifically with the issue of DRR education were selected for analysis in this study, as follows: 1) child participation in DRR, 2) DRR related activities in schools, 3) involvement of external stakeholders, 4) facilitating and deterrent factors on DRR education and 5) teachers' training. Other findings from the questionnaire will be further explored for later study.

Two questions related to facilitating and deterrent factors on DRR education are central to this study. These factors included eight deterrent and eight facilitating factors identified from the Johnson et al. (2014a) study. Building on this, three deterrent and four facilitating factors were added in consideration of the Indonesian context (**Error! Reference source not found.**). Participants were able to select multiple factors.

The additional factors were developed primarily based on the author's personal observations and experience working on DRR education in Indonesia. One of the approaches that has been used in Indonesia is to infuse DRR learning materials within the existing curriculum (UNESCO & UNICEF, 2012). Therefore, a parameter was added on "Innovative methods for curriculum inclusion (e.g., combining learning with school drills)" and "Lack of knowledge in developing curriculum for disaster education" to investigate teacher's capacity in infusing DRR into the existing curriculum. In addition, community representatives play an important role in the management of Indonesian schools, as described by Vernez et al. (2012). Thus, another parameter was added related to the role of the community in influencing DRR education in schools. Furthermore, Indonesia has inserted DRR education in the curriculum guidelines since 2009 (The Curriculum Centre or Pusat Kurikulum, 2009). Therefore, a parameter of "Clear policies for school to deliver disaster risk reduction education for children" was added to explore whether or not school personnel have clarity about this policy. Lastly, from anecdotal observations and experience, a typical problem that appears to influence teachers is the availability of resources – funding or dedicated personnel - that usually occur. This is also implied by Johnson et al. (2014c). Thus, an item to assess this possibility was included that questioned whether or not "Dedicated personnel and budget (are) made available."

Table 4. Facilitating and deterrent factors for teachers to implement DRR education

No.	Deterrent factors	Facilitating factors
	Taken from the Johnson study (8 facilitating and 8 deterrent factors)	
1.	Lack of "ready to go" and "child-friendly" teaching resources	Availability of useful "ready to go" and "child friendly" teaching resources
2.	Lack of training in developing and/ or delivering programs of this sort	Promotion on the teaching resources by other teachers or education personnel
3.	The topic is not relevant for the students	Training available on how to develop and/or deliver such programs for children
4.	The topic is not a priority by the school management	The topic becomes a priority by the school management
5.	Not compatible with my beliefs about what children should learn in school	Topic is timely in relation to upcoming risk for local natural hazards (e.g., bushfire/fire/cyclone/flooding seasons)
6.	Not enough space in the curriculum	Personal interest in the topic
7.	Weak coordination between schools, disaster management agency, and local councils	Student interest in the topic
8.	No clear mandate and/ or policies to implement disaster risk reduction education for children	Good partnerships between schools, disaster management agency, and local councils
	Additional factors considering the Indonesian context (3 facilitating and 4 deterrent factors)	
9.	Lack of knowledge in developing curriculum for disaster education	Innovative methods for curriculum inclusion (e.g., combining learning with school drills)
10.	Lack of interest from the community	Clear policies for schools to deliver disaster risk reduction education for children
11.	Not enough budget and personnel	Dedicated personnel and budget made available
12.	Other, please specify	High demand from the local community/ students on disaster risk reduction education for children
13.		Other, please specify

3.2.3. Procedure

The self-completed questionnaire was distributed at the end of a training session organised by the Provincial Disaster Management Agency (BPBD) of Jakarta and the Consortium for Disaster Education (CDE). The training was a focused session for staff in flood-prone primary schools in the Jakarta area to learn more about appropriate preparedness and emergency response measures for their schools. While the training did not cover DRR education, the session was considered a good opportunity to target a large group of teaching staff who not only worked at high-risk schools but would also have an increased awareness of the risks they faced and disaster-related terminologies.

An explanation of the nature of the research, including its purpose and ethical measures, was provided. Participants completed the questionnaire in the same setting. However, observations made it clear that they did not discuss their responses with each other.

3.2.4. Data management and analysis

The data set was first screened for errors visually, and then by investigating the score ranges using frequency tables for all variables, and checking for any missing values. No errors or missing values were found and frequencies were found to be in range. Statistical analyses using reliability tests were considered but were not applied as the sample size was considered too small.

3.3. Stage 2: Focus group discussion with NGOs

3.3.1. Participants

The FGD was organised with the following five child-focused development agencies that promote the implementation of DRR education in Indonesia: United Nations Office for Coordination of Humanitarian Affairs (UN OCHA) –representing CDE, Plan International (Plan), UNICEF, Save the Children (STC), and World Vision Indonesia (WVI).

These agencies were selected because they are international agencies who have CCDRR programs in Indonesia. Two other organisations (Indonesia Red Cross and Child Fund International) were invited however, one agency did not respond to the invitation and the other was unable to attend due to unforeseen circumstances. It was intentional to invite only international agencies, despite the fact that there are also local NGOs who have CCDRR projects in Jakarta. This is because from my long-standing experience working in this sector, CCDRR projects in Indonesia continue to be driven by international NGOs. Local NGOs often act as implementing agencies of these international NGOs and tend to partner with and follow the policies of and direction from international agencies.

Five people (three males and two females), one from each organisation, participated, which is considered an ideal number for FGD on non-commercial topics (Krueger & Casey, 2015). The small size allowed time for in-depth discussions and clarifications. The participants were middle to senior level staff with more than 7 years of experience in implementing DRR projects in Indonesia. There are no differences on the way participants discussed the issues between genders.

3.3.2. FGD topics

A series of discussion topics (see Appendix B) was developed based on my personal experience of working as an NGO and CCDRR practitioner and based on the findings of the teachers' survey. However, as is best practice with in-depth qualitative research, it was also the intention for participants to discuss and digress on topics they felt were most important to ensure coverage of a wide range of issues related to CCDRR (Kitzinger, 1995).

The first half of the session covered topics in relation to the CCDRR work participants had been involved with, specifically the following: participants' views of their agencies experiences and understanding of CCDRR; the successes, barriers and challenges to implementation, sustaining and scaling-up; measures used to overcome problems; and, other issues linked to sustainability and scaling-up. The second half of the session focused on the role of children in contingency planning. Seven steps of contingency planning and three levels of children's participation were developed based on guidelines from BNPB (2013) and Save the Children (2007a). The findings from the second half of the session will be used for later study focusing on children's participation in contingency planning processes.

3.3.3. Procedure

FGD participants were briefed on the nature of the research, including its purpose and ethical measures. Participants were also asked for their permission to record the discussion.

My background in working for a child-focused NGO in Indonesia enabled an informal and relaxed environment that was intended to facilitate an honest and critical discussion. However, it was also recognised that my involvement as moderator of the FGD could create bias due to my knowledge of CCDRR programs and past employment with NGOs. To avoid this, and to promote increased data collection rigour following FGD methodological recommendations, I had a very limited role in the discussions. That is, this involvement included only prompting and providing probing questions when needed, thereby avoiding the temptation to contribute my own perspectives (as shown in Barbour, 2010; Morgan, 2012).

The FGD was held in a UN meeting room that is regularly used as a meeting place for NGOs and therefore seen as a "neutral", and also familiar space for the participants. Most participants were active in the FGD and shared their own perspectives and experiences. The discussion lasted for 1 hour and 40 minutes.

3.3.4. Data management and analysis

The audio recording was transcribed verbatim and the transcripts analysed with the use of the qualitative data analysis software, QSR NVivo 10®. I assigned coding using a Grounded Theory method. This method was selected since there studies involving NGOs in DRR education are very limited. Therefore, it is an appropriate approach to construct new theories and to understand new trends in research (Greig et al., 2012).

This theory provides a systematic yet flexible, rigorous, and comprehensive approach for collecting and analysing data in qualitative research (Bryant & Charmaz, 2007b). The theory allows the researchers to analyse the data with an open mind not limited by previous theories (Mardis et al., 2014).

The coding process was completed in three stages, as per recommendations from Bryant and Charmaz (2007a):

(1) Initial coding was completed to define the barriers and challenges in the implementation of CCDRR practices, as stated by each participant. To ensure rigour, a co-researcher also coded a section of the transcript in order to verify the coding schema developed.

(2) Focussed coding involved a deeper analysis of the initial coding structure where each comment was classified in terms of whether it related to implementation barriers and challenges associated with: a) governments, b) NGOs, and/or c) schools (including teachers, children or students);

(3) Theoretical coding through sorting and arranging quotes to build a cohesive description of the barriers and challenges on the implementation of CCDRR practices.

3.4. Stage 3: Student questionnaire

3.4.1. Participants

The questionnaire was conducted with students of Grades 4 and 5 in Kembangan Selatan 2 Pagi Public Primary School. This school was selected as it has an ongoing DRR education program. The school principal took part in the school personnel questionnaire (see Stage 1). During the training course, initial rapport was built resulting in permission being granted by the principal for this research to be conducted with students at their school. The school has one school principal (female), 22 teachers (11 female and 11 male) and two personnel as school guards (both male). Nine teachers have bachelor degrees, and 13 teachers have 2-year diploma degrees in education.

Based on personal communication with the school principal, the school is prone to flooding every year. In early 2014, there were two occasions where the floodwater reached one metre in depth, forcing the school to be closed for a week on both occasions. Students in grades 4 and 5 were selected as previous studies have demonstrated that they have sufficient reading and communication abilities to respond to the type of items included (Clerveaux, V & Spence, 2009; Ronan & Johnston, 2001; Soffer et al., 2010; Towers, 2015).

A total of 140 students ranging from 9 to 14 years of age (*M = 10.48, SD = 0.76, comprised of 73 girls and 67 boys*) responded to the questionnaire. The total number of students enrolled at the school is 408 students (204 girls and 204 boys).

3.4.2. Materials

The questionnaire for students was comprised of 40 questions divided into three sections (Table 5): 1) questions to ascertain demographic information, 2) perspectives of DRR and, 3) questions to measure participant's knowledge on DRR (hereafter referred as the knowledge test). Items of the questionnaire were drawn from previous research and theory and included questions to ascertain DRR-related knowledge, risk perceptions, emotions, attitudes about DRR, participation and school- and home-based readiness for hazards (Table 5).

The student questionnaire was pre-tested with several academic colleagues who have relevant experience in drafting questionnaires. It was also pre-tested with colleagues from Save the Children and then piloted with 182 children in five schools in North Jakarta as part of a baseline study conducted by Save the Children.

Table 5. Parameters of student questionnaire (a copy of the questionnaire is provided in Appendix C)

No.	Parameters	Indicators	Type of responses	Sources
1.	Demographic variables		Short-answer open-ended questions	
2.	Knowledge of risk and DRR	Types of hazards surrounding children's homes and school;	Multiple options	Webb and Ronan (2014); Tanner (2010)
		Perception of DRR knowledge; Interest in DRR and why	Yes, No, I don't know	
		Source of DRR knowledge; People close to participants	Multiple options	
3.	Emotional factors in relation to disasters	Type of emotions in relation to disasters	4-point Likert scale (1=Not at all to 4=always) with "I'm not sure" option	Webb and Ronan (2014); Johnston, David et al. (2011)
		Feeling calm and not upset during emergency	Yes, Maybe, No, I'm not sure	
4.	Participation in DRR activities	Experience in drills, preparedness planning and interests in DRR activities	Yes, No, I'm not sure	GADRRRES and UNISDR (2014)
5.	Perception of school and home readiness	Level of readiness to face disaster risks	4-point Likert scale (1=Very unprepared to 4=very prepared) with "I don't know"	Whittaker and Handmer (2010)
6.	The knowledge test	Questions related to fire prevention and safety (5 questions), flood preparedness and response (10), and hygiene behaviour (5)	4-point Multiple options	Dinas Pemadam Kebakaran & Penanggulangan Bencana (n.d.); IFRC (2013); Polda Metro Jaya (n.d.); Webb and Ronan (2014)

The pilot survey showed that children were having difficulties filling in open-ended questions and also that their concentration was reduced if the process took over an hour. Therefore, the number of open-ended questions was minimised and the total questions restricted to simplify and shorten the process. Considering the changes made to the questionnaire, the results of the pilot survey are not included in the analysis presented here.

As with the school personnel survey, options of "I'm not sure", "I don't know", and "Other, please specify" were provided to reduce pressure and avoid participants answering randomly (Krosnick et al., 2002).

The questionnaire assesses respondents' awareness on the risk surrounding them (at homes and in school) and their perception regarding their DRR knowledge, and then tests their actual knowledge on specific hazards. This is designed to measure respondents' perceived preparedness in relation to their actual knowledge.

Respondents were asked to identify hazards that are likely to occur in their surroundings (at homes and in school). Twelve common hazards in Indonesia (i.e. earthquake, tsunami, landslides, volcano eruption, floods, strong winds/ typhoon, droughts, forest/ bush fire, structural fire, tidal wave, disease outbreaks, riot, conflict or violence) were presented as multiple options and each respondent able to select more than one hazard. An option of "Other, please specify" was also presented.

Dickson et al. (2012) conducted a risk assessment of Jakarta and identified earthquake, floods, strong wind, structural fires, and high tide as the likely hazards that may occur in Jakarta. Meanwhile, a combination of overcrowding and poor living conditions makes it prone to disease outbreaks (WHO, 2005). In addition, historically Jakarta is prone to riot, conflict or violence (Tadjoeddin, 1990). From these publications, it was concluded that the likely hazards in Jakarta are earthquake, floods, strong wind, structural fires, high tide, disease outbreak, riot, conflict, or violence.

The knowledge test is comprised of questions related to fire prevention and safety, flood preparedness and response, and hygiene behaviour. These topics were selected based on the hazards that often occur in the study location (i.e. fire risks and floods). Hygiene behaviour questions were added as the children are often at-risk from secondary hazards (i.e. water-borne diseases) after floods (WHO, 2013).

Scoring criteria (Table 6) was developed to classify participants according to the level of knowledge into the following groups: high, medium and low. For example, participant who

selected three correct answers (out of 5 questions) in relation to hygiene were rated to have a medium level of knowledge. This classification was used to differentiate children with a high level of knowledge in DRR and others who require more learning.

Table 6. Criteria for classifying children's knowledge and skills

No.	Type	Number of correct answers			Total questions
		Low	Medium	High	
1.	Fire prevention and safety	0-2	3-4	5	5
2.	Flood preparedness and response	0-5	6-8	9-10	10
3.	Hygiene behaviour	0-2	3-4	5	5
4.	Overall	0-9	10-18	19-20	20

Based on observations, and the high completion rate, with all children completing all questions, its clear that the children coped well with the length of the survey (maximum 60 minutes).

3.4.3. Procedure

The survey was completed during class time over a two-day period in early January 2015, prior to the peak of the monsoon season (usually expected in early February). The data collection took just under one hour each day.

The survey participants (students) sat in the class room while the facilitator read out loud the questionnaire in front of the class. Beforehand, the facilitator explained the purpose of the questionnaire and the research project, how to mark their answers, the expected duration and most importantly that their involvement was entirely voluntary. The participants were also informed that their response would not affect their academic standing.

The whole process was supervised by a teacher. During the process, discussion about question clarification was encouraged. However, no discussion or deliberation between students about their answers occurred. Approximate time taken across 4 classroom administrations was 60 minutes per session.

3.4.4. Data management

The same procedure documented earlier for stage 1 was applied for the student questionnaire.

Chapter 4

Results

The following section describes the results from the three stages: survey questionnaires with school personnel and children, respectively, and FGD with child-focused NGOs. Results are divided per theme and the FGD results are presented using verbatim quotes of the participants.

4.1. Questionnaire: School personnel

4.1.1. Children's involvement in DRR

The results illustrate that the majority of teachers are confident in their abilities to involve children in the disaster preparedness process (86%), feel positive that children should learn DRR education in schools (68%), and consider children to have an important role in disaster preparedness (89%). The majority of teachers also think that children should be involved in developing preparedness plans for their homes (61%) and school (57%).

However, when it comes to children's participation, the views of teachers are divided, with 45% considering that this might increase the risks faced by children and 39% believing that children should not be *actively* involved. This result may come from the participants' understanding of the meaning of "active participation" which can be ambiguous and worthy for future investigation (i.e. what does 'active participation of children' mean to different stakeholders?). Nevertheless, this presumption is potentially a significant obstacle to children's participation in DRR through schools or classrooms where this perception is prevalent.

4.1.2. Deterrent and facilitating factors in implementing DRR education

A total of eight facilitating factors and five deterrent factors (shown in italics in Table 7) were selected by more than one-third of participants. Hence, these factors are considered key factors that influence the implementation of DRR education in Indonesia. Moreover, two-third of participants (69%) selected more than one option, indicating that school personnel feel that the issues in implementing DRR education in Indonesia have multiple dimensions. While inspection of Table 7 underscores this point, a few factors stand out as more important. The biggest is teachers' training.

Table 7. Teachers' responses to facilitating and deterrent factors in implementing DRR education in their classroom (participants able to select more than one factor)

No.	Facilitating factors	% of respondents (n=44)	Deterrent factors	% of respondents (n=44)
1	*Training available on how to develop and/or deliver such programs for children*	*84%*	*No clear mandate and/ or policies to implement disaster risk reduction education for children*	*52%*
2	*Good partnerships between schools, disaster management agency, and local councils*	*57%*	*Lack of training in developing and/ or delivering programs of this sort*	*52%*
3	*Innovative methods for curriculum inclusion (e.g., combining learning with school drills)*	*52%*	*Lack of "ready to go" and "child-friendly" teaching resources*	*48%*
4	*Availability of useful "ready to go" and "child friendly" teaching resources*	*50%*	*Lack of knowledge in developing curriculum for disaster education*	*41%*
5	*Clear policies for school to deliver disaster risk reduction education for children*	*48%*	*Weak coordination between schools, disaster management agency, and local councils*	*36%*
6	*Personal interest in the topic*	*41%*	Not enough space in the curriculum	30%
7	*Promotion on the teaching resources by other teachers or education personnel*	*39%*	Not enough budget and personnel	30%
8	*Dedicated personnel and budget made available*	*36%*	The topic is not a priority by the school management	25%
9	Topic is timely in relation to upcoming risk for local natural hazards (e.g., bushfire/fire/cyclone/flooding seasons)	23%	Not compatible with my beliefs about what children should learn in school	7%
10	The topic becomes a priority by the school management	14%	Lack of interest from the community	5%
11	High demand from the local community/ students on disaster risk reduction education for children	11%	Other	5%
12	Student interest in the topic	5%	The topic is not relevant for the students	2%
13	Other	5%		

4.1.3. Preferences on type of teachers' training

All participants were interested in training if it was offered and didn't impinge unduly on their time. A blended or combination approach received the highest endorsements, with strong preference for a combination of "classroom or instructor led" and "experiential or hands-on" (Table 8). Another 38% selected only using experiential or hands-on training. Computer-based training, online learning and using only classroom type learning were the least popular methods.

Table 8. Teachers' responses to the preferred type of training for teachers

Type of trainings	% of respondents (n=44)
Classroom or Instructor-Led training	5%
Experiential or Hands-on training	38%
Computer-Based training	2%
Online or E-learning	5%
Blended or combination of the above	50%
Others	0%
Total	100%

4.1.4. Partnerships with other stakeholders

Participants were also asked about the level of coordination between their schools, the local council and the disaster management agency. The survey results suggest that the level of coordination varies. More than one-third of the participants (37%) think that the coordination is non-existent to low, 36% believe there is a medium level of coordination, and 25% stated that the coordination level is high. The participants were also asked whether they desire future changes to the level of coordination between these stakeholders and 75% answered "yes", 18% answered "no" and 7% did not answer the question.

Of those who answered yes, two-third provided reasons of which, 45% were related to improvement in disaster response and 32% in relation to disaster preparedness (see Table 9 for examples).

Table 9. Examples of comments of expectation resulting from partnerships with other stakeholders

Respondents' comments	Examples
... in relation to improve disaster response	"*When disasters occur, all relevant agencies can visit straight to the location*"
	"*Easier to coordinate with the Council office so the response provided is quicker and more responsive*"
... in relation to improved disaster preparedness	"*So that teachers and students have an improved understanding of disaster preparedness*"
	"*Disaster management office should visit schools to explain directly to the students how to be prepared for floods*"

4.2. Questionnaire: Children

4.2.1. Perceptions of knowledge versus actual knowledge

A total of 79% of children correctly identified the hazards surrounding their homes and 62% identified the hazards surrounding their school that are likely to occur, i.e. earthquake, floods, strong wind, structural fires, high tide, disease outbreak, riot, conflict, or violence (as per Dickson et al., 2012; Tadjoeddin, 1990; WHO, 2005). This indicates that the majority of children have a good awareness of the hazards in their surrounding environment. Meanwhile, 21% of children identified hazard(s) in their homes and 38% in schools that are not likely to occur in Jakarta, i.e. tsunami, landslides, volcanic eruption, drought, or forest fire.

The survey also showed that the majority (71%) of children think they know how to be safe. However 14% of children do not think they know how to be safe, and 14% answered I'm not sure and 1% did not answer the question.

Nearly all children think that they can or maybe can make themselves (94%) and others (91%) comfortable or calm in an emergency. However, the majority of children (61%) sometimes feel worried, scared or upset when thinking or talking about disasters.

The results of the knowledge test (see Table 6, p. 37 for methods) illustrates that most children have a medium level of knowledge overall, scoring best on flood preparedness and safety (Table 10). This finding is consistent with their experience as floods are an annually recurring problem for these children. However, the children scored poorly on hygiene behaviour knowledge and fire prevention and safety (only 2% and 15% rated as having a high level of knowledge respectively).

Table 10. Student scoring on the knowledge test (n=140)

Level of knowledge	Overall test	Hygiene behaviour	Flood preparedness and safety	Fire prevention and safety
High	3%	2%	26%	15%
Medium	89%	62%	59%	61%
Low	8%	36%	15%	24%
Total	100%	100%	100%	100%

When comparing the knowledge test results against the 71% of children who indicated that they know how to be safe from disasters, we learn that nearly all of them (96%) scored in

the low-to-medium range of knowledge, with only 4% having knowledge in DRR in the high range. This illustrates that almost all children who perceive that they know how to be safe actually scored poorly on the knowledge test.

4.2.2. Participants' interest on DRR education and involvement in preparedness

Nearly all (94%) participants would like to know more about how to stay safe (Table 11). The reasons given for wanting more knowledge were grouped into three themes (Table 12). Only one participant gave a coherent reason for not answering 'yes' to this question and that was that the child did not want the disaster to happen in the first place, illustrating the preference for disaster prevention.

Table 11. Students' responses related to their perspectives on disaster risk reduction (n=140)

Questions	Yes	No	I'm not sure	No Answer
Would you like to know more about how to stay safe from disasters?	94%	4%	1%	1%
Would you like to be involved in making your school to be more prepared for disasters?	83%	7%	9%	1%
Would you like to be involved in making your home to be more prepared for disasters?	86%	12%	1%	0%

Table 12. Themes and examples of participants' comments on why they would like to know how to be safe from disasters

Themes	Examples of related comments
To know how to be safe for themselves	*"Because I want to know how to be safe from disasters"*
To overcome their fears in relation to natural hazard impacts	*"Because I fear drowning and many diseases"*
	"Because floods make me panic"
	"To be safe and not to worry when it [disaster] comes"
To protect self, other people and the surrounding areas	*"We have to protect the environment in schools and homes"*
	"Because if it [disaster] happens, I want to save my family and neighbours"
	"I can protect myself and others"
	"I can save others and help"

Table 11 also suggests that a high majority of participants would like to be involved in making their school and home more prepared for disasters. From the participants who

answered “No”, only a few provided clear reasons, which were: “I have never experienced disasters”, “I do not want to be affected by disaster”, “because mom and dad would not allow me *[to be involved in preparedness activity]*”, and “because it *[involved in preparedness activity]* makes things difficult”.

4.2.3. Linking household and community preparedness with DRR education in schools

The top five responses on the source of knowledge of DRR for children are father (51%), mother (44%), teachers (36%), TV and radio (26%), and internet (16%). On the other hand, children discuss their daily activities with: their mother (75%), father (55%), friends at school (41%), siblings (19%), and neighbourhood friends (13%).

The majority of children (71%) think their home is prepared for disaster even though the majority (64%) have never undertaken disaster practices and/or simulations at home and less than half (49%) report having a written household preparedness plan. The majority of children (69%) also think that their school is well prepared. However, the school does not have a written preparedness plan (*pers. comm. with school principal* - Manawiyah, 2014).

Of those who do not have written household plans, three-quarters (75%) indicated that they want to and nearly all (91%) children want to have a school disaster preparedness plan. Most children think that they have to be involved in developing preparedness plans for their homes (77%) and their school (86%). Similarly, most children want to be involved in making their school (83%) and their homes (86%) better prepared.

4.3. FGD with child-focus NGOs

During FGD, participants shared their CCDRR project experiences, including successes and progress coupled with the challenges they have faced. Participants described past and current efforts undertaken to promote DRR education in Indonesia based on their experiences. One line of discussion focused on sustainability and scaling-up of DRR and the associated challenges of moving beyond a “project mentality” to more sustained, scaled implementation of these programs. This discussion also included the measures that participants have undertaken to address these challenges. FGD participants’ descriptions of these challenges and attempted solutions are designed to strengthen, and triangulate information on the barriers and challenges in implementing DRR education as identified through the school personnel questionnaire.

4.3.1. Capacity to monitor when the project finishes

During the discussion on the NGOs experiences in implementing CCDRR, several main obstacles were identified. The first is that NGOs face a significant challenge to sustain the project when the funding finishes, linked to what participants described as a "project mentality" problem.

> *"What about* [the sustainability] *of school-based DRR? Usually if the project ends, then it ends."*

> "*Sustainability. Well, it is easy to say it but to realize it is very hard …our weakness is in monitoring after the project is finished, especially project areas where we do not have regular office presence."*

Most international NGOs do not have a long-term office presence at the local (or district) level and, according to participants, lack a strategy or vision to ensure sustainability in the Indonesian context. When the program ends, the office is closed and staff are relocated. Hence, these agencies lack the capacity to monitor or support sustainability of a program after it finishes. Participant discussion also confirmed that the current government's monitoring system do not assess the implementation and evaluate progress and effectiveness of DRR program, including in schools.

4.3.2. Funding limitation for comprehensive package of safe schools program

Secondly, participants stated that NGOs usually have limited funding. Hence their activities are often limited to delivering singular activities versus more comprehensive packages of education and teachers' training. Training and/or emergency drills were highlighted as the common activities facilitated and carried out:

> *"We organized training on Disaster Prepared Schools in 2008… At that time, the training involved not only teachers but also the school community."*

> *"In a safe school package there are a range of activities from A to Z, maybe we can only implement from A to D, not the whole package. …the simplest activity is to conduct a disaster simulation… to expect implementing one full package like we want, we still have not been able to do it."*

These arguments were echoed several times, with associated activities being reported to be one-off events, without exception. When NGOs do succeed in advocating with local government to allocate funding for DRR implementation, the funding is often small, with reports of competing development priorities as one source of this problem:

> *"The reality is that certain districts have limited funding. So, we face tough choices. Which one that needs to be included in their development priorities, and when we talk about DRR, this goes to the back* [not as a priority]*."*

> *"That is the challenge in our bureaucracy… they allocate a budget for a very limited package."*

This then restricts the ability to implement a comprehensive package for a school-based DRR program.

However, some participants had counter arguments in relation to funding issues. One participant mentioned that funding is available, particularly at the national level as one participant stressed that the issue is not about budget but is more of a lack of understanding and capacity of government officials associated with engaging and promoting children's participation. Another participant mentioned that there are opportunities for funding at the local level:

> *"There is an opportunity in the near future for funding since the new Village Law allocates 1 billion Rupiahs* (approx. US$ 78,000) *to every village… this is a good opportunity… If we can obtain just 10% of it every year, it is more than enough… Influencing people* [on DRR programs] *in the village, based on our experiences, is easier compared with people at the district level and above."*

Thus from the views of at least two participants, it was clear that implementation problems are not a sole function of funding limitations.

4.3.3. Political will from the Government

Participants discussed their frustration with the current and past government administrations, including DRR and education agencies, which still view children as passive participants:

"…even in [disaster] *preparedness activities* [such as disaster simulations] *…most of the time they are being treated as objects…"*

The Disaster Management Agency and the Ministry of Education have not put the issue of children and DRR as a focus. This, combined with a lack of policy or political will, was considered a hindrance to the implementation of DRR education in schools:

"The government does not have a specific focus on children, especially in the disaster sector. Until now, vulnerable groups have not even been the focus of emergency response … even in emergency response, the child-focused component is still not there."

"Up to this day, we still have problems with the Ministry of Education and the Curriculum Centre. They still do not have the solid "political will" for our [DRR] *education system. So, we could not expect the schools to sustain it."*

Nevertheless, moving beyond a project mentality is an issue that all participants stated having in their focus. This includes discussion that emphasised the importance of involving and working alongside government officials. A crucial step for NGOs, to ensure the sustainability of a program and create a sense of ownership, was considered to be establishing relationships with government from early in the development of a project:

"We always make sure that from the beginning, the government is involved. As early as we can, we involve the government because later we hope that they will replicate it."

However, participants noted the challenge in maintaining relationships. This includes engaging and building the capacity of selected individuals in an agency as they are commonly transferred (every two to three years) to other agencies in different sectors, thus taking the knowledge and institutional memory of that collaboration with them.

"Personally, I think we should try to build a system. If we are not building the system, then it will depend on individuals. If the individuals are replaced, then it will all be over."

To anticipate this, participants recognise the importance of long term implementation planning to secure commitments and anticipate government turnover:

"Right now BNPB [National Disaster Management Agency of Indonesia] *is developing a policy at the national level called National Framework for Preparedness and Response … hopefully by having this, there will be a work plan, and it will not be treated as a one-off project that only depends on the individual person… so it is not up to the person but* [how to] *implement the work plan."*

"Alternatively the government should have ownership [of the program] *and also be prepared for turnover* [of government employees]."

4.3.4. Targeting the right partners

According to participants, identifying with whom you are working with in the government is also essential. Participants described an example during the time they advocated for DRR to be integrated in the national curriculum:

"Let's take for an example, SCDRR [Safer Community through Disaster Risk Reduction]*. They* [SCDRR Project team] *spend lots of money to develop the modules but that still does not guarantee success. They start through the Curriculum Centre, but other directorates who oversee the schools won't buy it."*

The participants describe that in 2010, the United Nations Development Programme in collaboration with the CDE supported advocacy efforts through a project entitled Safer Community through Disaster Risk Reduction (SCDRR). They worked closely with the Curriculum Centre, a unit within the Ministry of Education who hold the authority in designing the national curriculum. This effort resulted in the addition of a DRR component in the national curriculum and also the issuance of a letter signed by the Ministry of Education and sent to all education offices to encourage DRR implementation in schools.

On the other hand, a different set of units, the Primary Education and Secondary Education directorates, oversee the implementation of policies in primary and secondary education. And, these directorates were not involved in the previous stage described, there was thought to be a lack of awareness and low sense of ownership from these directorates to enforce DRR-related policies in the schools, as perceived by the participants in the FGD:

"… at the national level, there have been plenty of guidelines. Now, it is more on how we can implement it and enforce the policies."

The participants also identified that since there are a lot of actors that should be involved in DRR education, including different units within the Ministry of Education and other agencies (e.g. the National Disaster Management Agency, Ministry of Religious Affairs, and NGOs) who have relevant experiences and interests. Therefore, building inter-agency collaboration and having support from the top level was considered essential.

> *"We need that top down approach… for example with the WASH* [Water, Sanitation, and Hygiene promotion] *sector, the involvement of inter-agencies are far better compared to the DRR* [sector]*. And there is collaboration between agencies... Led by the National Development Planning Agency. Why does that work? Because of the support from the top."*

In addition, some participants mentioned the value of building a coalition at the national level in order to strengthen the efforts to ensure children's views reach the government:

> *"The Children in a Changing Climate Coalition has already existed for a long time and this is not donor driven, but because we believe that children can be agents of change... Maybe, that is an interesting idea* [establishing coalition at the national level] *because there are a lot of players* [who have similar interests]*."*

Chapter 5

Discussion and Recommendations

Overall, the results from the survey and FGD have shown the importance of DRR education in schools, based on the perspectives of school personnel, children, and NGOs. The majority of teachers believe that DRR education is a useful subject for children to learn in schools.

The children's survey results suggest that the majority of children: 1) have an awareness towards the hazards surrounding them, 2) believe they know how to stay safe from those hazards, and 3) want to be involved. However, while most of these children think that they know enough on how to stay safe from disaster nearly all of attained scores within the low-to-medium range on the knowledge test. This is an important finding that illustrates children have a lack of actual knowledge in DRR even though they have a sense of hazard awareness and believe that they know how to stay safe in a disaster. This also illustrates the necessity of DRR education. However, it must be noted that knowledge and taking appropriate actions in response to disaster risk are not directly correlated.

Having a level of hazard awareness is an important and an initial step to become better prepared (Bird et al., 2009; King, 2000; Paton et al., 2008). However, previous studies of other hazards (e.g. bushfire, earthquake, and storms) have demonstrated that a high level of awareness does not mean they have the correct knowledge, are able to practice it when needed, or are necessarily better prepared (Basolo et al., 2008; Kapucu, 2008; Whittaker et al., 2013). This is because there are many other factors at play, not least underlying vulnerabilities. This can be more important than knowledge in influencing behaviour and outcomes in relation to risk reduction (Bird et al., 2011; Haynes et al., 2008; Whittaker et al., 2013; Wisner et al., 2004).

Alarmingly, children scored poorly on hygiene and fire-related topics. Poor hygiene can lead to water-borne illnesses (WHO, 2013) and anecdotally, these illnesses (e.g. flu, skin diseases, and diarrhoea) often cause children to miss school (personal communication with school principal - Manawiyah, 2014). In addition, the number of fatalities from fire in Jakarta are three times higher than those caused by floods (BPS, 2014).

In terms of children's psychology, the results were positive with most children stating that they can make themselves and others comfortable or calm in an emergency. However, the majority of children sometimes feel worried or upset when thinking or talking about disasters. These perspectives should be evaluated against the actual circumstances, as there

is a concern that perceptions of being calm might be inflated, as with the perception of safety. Equally, CCDRR programs have been shown to reduce children's hazard-related fears (Johnson et al., 2014a). Thus, these conclusions support programs that help build knowledge and skills, reduce fears and build realistic confidence.

As noted in Chapter 4 (p. 38), five deterrent and eight facilitating factors are considered as key factors. These are then synthesised into six key issues related to the implementation of DRR education in Indonesia (Table 13). Interestingly, in this list, children's interest is not considered as a factor of influence. However, the children's survey suggests a strong interest from children to learn DRR (Table 14). This is an important issue to keep in mind for schools considering the value of these programs. Each of the key issues and recommendations (seven in total) are discussed in the following sections. The discussion and recommendations are described at a level specific to the Indonesian context, as the purpose is to provide recommendations for policy makers and relevant stakeholders that can be applied at the national level for scaling up country-wide.

Table 13. Key issues identified from the facilitating and deterrent factors, combined with relevant perspectives from teachers, NGOs and recommendations from the Johnson study

Key Issues	School Personnel		Additional views from teachers	NGOs perspectives	The Johnson Study
	Key Deterrent Factors	Key Facilitating Factors			
1. Policy on DRR education in Indonesia	No clear mandate and/ or policies to implement disaster risk reduction education for children	Clear policies for school to deliver disaster risk reduction education for children	68% teachers selected DRR education as a useful subject for children to learn[8]	Enforcing the policies is an issue. No monitoring Involve the right government units from the beginning	Require disaster preparedness education in schools
2. Awareness of and access to DRR education materials	Lack of "ready to go" and "child-friendly" teaching resources	Availability of useful "ready to go" and "child friendly" teaching resources		Lack of support from the Ministry of Education on the use of the guidelines	Establish and maintain ongoing evaluation of the resource
3. Teachers' capacity	Lack of training in developing and/ or delivering programs of this sort Lack of knowledge in developing curriculum for disaster education	Training available on how to develop and/or deliver such programs for children Innovative methods for curriculum inclusion (e.g., combining learning with school drills)	86% teachers are confident to involve children in the disaster preparedness process Experiential approach or combining with classroom learning is preferred (89%)	Trainings for school stakeholders have been done by NGOs in the past but more as one-off events	Provide more teachers' training
4. Partnerships between schools and other stakeholders	Weak coordination between schools, disaster management agency, and local councils	Good partnerships between schools, disaster management agency, and local councils	75% teachers expect to have future changes on the level of coordination		Increase CDEM[9] interaction through web-based technology
5. Platform for teachers		Personal interest in the topic Promotion on the teaching resources by other teachers			No clear recommendations
6. Dedicated personnel and budget		Dedicated personnel and budget made available		Lack of technical capacity Lack of funding for a comprehensive package	Not identified as an issue

[8] In addition, 71% children think that they know how to be safe from disasters but score low-to-medium on the knowledge test
[9] CDEM is New Zealand's Civil Defence and Emergency Management office.

Table 14. Perspectives on children's participation in DRR

Key Issues	Teachers' perspectives	Children's perspectives	NGOs' perspectives	The Johnson study
7. Children's participation in DRR	45% teachers think that involving children will put children at greater risk	94% children would like to learn more on DRR	Children are still seen as passive participants	Not discussed in the study
	39% teachers think children should not be actively involved	>80% children want to be actively involved in preparedness at home and in schools		
	89% teachers believe that children have an important role in disaster preparedness and will benefits children			

5.1. Policy on DRR education in Indonesia

More than half of the school personnel participants think there are no clear mandates and/ or policies on DRR education. This indicates the lack of awareness or clarity on DRR education policies, as Indonesia already has policies in place for DRR education. An endorsement letter by the Minister of Education (2010) has been sent to all education offices in Indonesia encouraging schools to mainstream DRR. BNPB (2012) has also produced guidelines on safe schools.[10] In addition, DRR has been incorporated in the national curriculum from primary to secondary schools, starting from Grade 4 (The Curriculum Centre or Pusat Kurikulum, 2009). The existing policies already provide a base to enable DRR education in schools.

This set of findings is similar to that identified on the national implementation of a CCDRR program in New Zealand, where a program kit was sent to every primary school in the country. However, as the program is entirely voluntary, uptake has been quite low (Johnson et al., 2014c). Similarly, child-focused NGOs appeared to appreciate the development of a

[10] The nature of these policies is not imposing but more of encouragement. This is because Indonesia has a decentralised system where the central government has less authority compared to the district government over the education content, financial matters and school practice (Bjork, 2004)

national policy but equally lamented it being carried out in a systematic manner. This reflects a more pervasive problem in this area across the HFA with numerous countries developing DRR, or CCDRR, policy that was more "aspirational" than realised (Ronan, 2015).

Sudjana (2006) describes the current education monitoring system in Indonesia that assesses academic and managerial aspects in schools. Unfortunately the current monitoring system has not captured the progress on the implementation of the policies related to DRR education. This is a problem seen in many countries, especially on NGO-led projects, where the HFA has spurred the progress of the implementation of CCDRR education programs and other areas (Ronan, 2015). It is also worth noting that a systematic review of the 35 CCDRR education program evaluations done to date by Johnson et al. (2014b) found that none of these were evaluated locally, by DRR professionals, schools, or local community stakeholders (i.e., all were done by professional evaluators, over 90% being those in higher academic settings).

This state of affairs makes it a significant barrier for scaling-up and sustainability. Oversight on the implementation of all policies in primary and secondary education is within the authority of the Primary and Secondary Education directorates within the Ministry of Education (Primary Education Directorate or Direktorat Jendral Pendidikan Dasar, 2014).

Recommendation: The Primary and Secondary Education directorates should lead efforts to raise awareness of these policies (i.e. Ministry of Education letter and BNPB guideline) to all school personnel and other education across Indonesia. The directorates should also include DRR aspects in the school monitoring process so progress of DRR implementation is monitored and reported. Partnerships supporting research of the sort reported in this paper would enable key awareness raising, implementation, and monitoring and evaluation functions.

5.2. Awareness of and access to DRR education materials

Half the participants from the school personnel survey described that the availability of "ready to go" and "child-friendly" DRR education materials will facilitate teachers in implementing DRR education. This suggests that there is a low awareness and lack of access to DRR education materials that are already available.

The Curriculum Centre (2009) has produced guidelines for teaching on five main hazards (earthquake, floods, landslide, fire, and tsunami) in Indonesia. There are also a variety of

guidelines and teaching resources for teachers produced by other agencies such as the Red Cross (2009), UNESCO (2014), and Save the Children (2007b).

One issue is that there are no standards for approved "key DRR messages" in educational resources. That is, more generally, no system is in place to control and assure the quality of resources related to child-centred education frameworks, content, and delivery mechanisms. Previous studies have shown the importance of having standard and/ or consistent key messages (Ronan et al., 2010; Ronan & Johnston, 2001, 2003; UNESCO, 2014).[11] Teachers play an important role in transferring key messages and other empirically and theory-supported components to children, both before and after a disaster (Johnson & Ronan, 2014).

After the 2011 Great East Japan Disaster, there have been a number of collaborative efforts undertaken by the Japanese government, a professional association (geography teachers), and academics to revise the policy and implementation of DRR education. These measures include the formation of an expert committee to revise disaster prevention education policy, presentations at conferences, publications, and development of new lesson plans (Shimura & Yamagata, 2015).

The current results also demonstrate that school personnel favour the inclusion of innovative methods for delivering DRR education. Practitioners of CCDRR have developed several participatory tools for children -e.g. risk mapping, transect walks, participatory video, mind mapping- to identify and assess risks, communicate risks, and generate action to bring about changes in the communities (see Haynes & Tanner, 2015; Molina et al., 2009; Plan International, 2010a). Therefore, these tools should be considered for inclusion in the resource materials on DRR education in schools.

Recommendation: An online knowledge hub where teachers can access educational resources would be useful.[12] This hub could be a repository of various guidelines and teaching resources produced by various institutions[13]. In addition, the Ministry of Education should take the lead in developing and building partnership to provide a critical review of DRR education, including the development of standardised education materials, such as key

[11] See also the review of the 2009 Australian 'Black Saturday' bushfire by Whittaker et al. (2013)

[12] Online resources for DRR education materials have been used in Australia, US, Japan, New Zealand, and Peru.

[13] Using online database is also align with the government program targeting 300,000 schools to be connected with internet access by 2015 (Ministry of Education of Indonesia, 2013)

messages for teaching DRR in schools and other research and theory-supported components and frameworks.

Building partnership would likely yield benefits through inviting relevant institutions and subject matter experts such as the BNPB, the Ministry of Research and Technology, and also academia and practitioners, including principal and teacher "champions" [14].

Since education frameworks and practices like key messages are intended for teachers to use for children, child education experts should also be involved to ensure the materials are appropriate for children. Keeping in mind that innovative methods that engage children to be proactive and promote positive behaviour related to DRR should be included in the DRR education resources.

5.3. Teachers' capacity

A significant percentage of teachers (84%) describe a belief that training will help them facilitate the implementation of DRR education in their classroom or school. This percentage is much higher than for other facilitating factors. It received support from 30-60% of participants. Some teachers are confident in their abilities to involve children in the disaster preparedness process. However, almost half believe that involving children will put children at greater risk. In the aftermath of the 2011 Christchurch earthquake, some teachers also expressed fear that DRR education will scare children and were unsure of how to involve them without detrimental effects (Johnson & Ronan, 2014).

Many evaluation studies related to DRR education suggest the need for training teachers in DRR, including the Johnson study. However, this poses a significant challenge for Indonesia with more than 17,000 islands and 269,000 schools (Ministry of Education and Culture, 2012) spread in 34 provinces comprised of 413 districts and 98 cities.

A cascading method has been used in Indonesia to roll out training for teachers, where Training of Trainers (ToT) is organized and the trainers that have been produced from this ToT continue to train other teachers (UNESCO & UNICEF, 2012). However, this option requires a significant number of master trainers and trainers for teachers. If the target is to train at least one teacher of each Indonesian school, almost 9,000 training sessions would be

[14] At the national level, there is already a national secretariat for safe schools, led by the Ministry of Education and comprise of government and non-government agencies with the purpose to make schools safer from disasters.

needed (by estimating a maximum of 30 participants per training). This number excludes training for the trainers and associated monitoring components.

Survey findings indicate that online learning or computer-based training were not the preferred options. This is unfortunate since in Turkey, e-learning was found to be effective in reaching a large number of participants over a short amount of time (Petal & Sanduvac, 2012). Even though the use of e-learning and computer based trainings are still not a common practice in Indonesia, in the coming years, as Indonesians gain better access and become more familiar with the internet and computers, this option should be explored.

Another way to improve teacher's capacity is by integrating DRR education in higher education programs for teachers. UNISDR (2008) considers this the most effective, least expensive, long-term and sustainable approach. This way, every person who is going to be a teacher knows the basic knowledge and skills to teach DRR to children in schools. However, only a few areas have used this approach (UNESCO & UNICEF, 2012) and there is no research yet on its effectiveness.

Recommendation: DRR education training should be integrated into higher education programs as part of teachers' professional development. The Indonesian government has enacted the Teacher Law that provides a professional allowance for certified teachers. The eligibility conditions for certification are meant for all teachers to have a minimum level of competencies (Chang et al., 2013). Therefore, given Indonesia is a highly disaster prone country, basic knowledge of DRR should be part of teachers' minimum competencies and DRR education should be part of the teachers' training program.

5.4. Platform for teachers

As it stands currently, the quality of DRR education in schools depends on teacher's willingness and their creativity to do it. This is reflected in the survey where personal motivation and promotion of education resources by other teachers are seen to be facilitating factors. Encouragingly, the survey results show that the majority of teachers believe children have an important role in disaster preparedness and that it will bring benefits to children.

Johnson and Ronan (2014) revealed that peer-to-peer support amongst teachers could be an effective mechanism to help teachers implement DRR education. Having teachers that are more knowledgeable and regarded as "champions" on DRR education could inspire other teachers to follow in their footsteps.

One way to address this is by building both a live and online platform for discussion amongst teachers so that they can share information about their experiences, successes, and challenges, and also find solutions for addressing challenges based on the experience of others. In addition, there have been several experiments on the use of creative tools that should be shared within this type of platform. For example, the use of songs, short drama, and theatre performances with children to increase their awareness and to assess their knowledge and skills on disaster risk reduction might be considered (Back et al., 2009; Dicky et al., 2015; Mitchell, T. et al., 2009). Such a platform would have the potential to improve the capacity of teachers, address frequently encountered challenges and provide up-to-date knowledge. The contributing network of school personnel could provide suggestions and advice on policies and directions of DRR education to the Ministry of Education. A similar bottom-up platform exists called Disaster Resilient Australia New Zealand School Education (DRANZSEN) in the Australia-New Zealand territory (AEMI, 2014). This mechanism is intended as a policy-practice-research relationship and problem solving mechanism designed to promote developments in DRR education, including providing feedback and advice to the policy and political actors.

The Indonesian government builds the national identity of young people in schools through various approaches. Every Monday morning, all school children have to perform a flag-raising ceremony and sing the national anthem. Every Friday, all school children have to do morning aerobics together, with specific choreography that aims to build a citizenry ethos (Moser, 2015). These approaches, repetitive in nature, can also be replicated to instil preparedness and risk reduction knowledge. School principals can disseminate preparedness messages to educate students on the upcoming rainy season during the flag ceremony, as was done by SD Kembangan Selatan 01/02 Pagi, where the children's survey took place (pers. comm. with school principal).

Another way to reinforce this linkage is by organising a competition at the national level for the most disaster prepared schools. Several studies indicate that competition among schools improves the quality of teaching and school performance (Dee, 1998; Hanushek & Rivkin, 2003; Hoxby, 2003; Wößmann, 2007). Similar competitions have been implemented by the health sector. The government-run "Healthy School" competition, held annually at the national level, identifies healthy schools based on cleanliness, sanitation and classroom facilities which includes provision of clean water, solid waste and waste water removal, and

also the provision of adequate school yards, gardens and fences (Direktorat Jendral Pendidikan Dasar, 2015).

Recommendation: A live and online discussion platform should be established to connect teachers across Indonesia who have interest in DRR education. Infusion of DRR messages through the weekly flag ceremony and/ or weekly aerobics could be an option. A competition at the national level could also motivate teachers and schools and identify "champions" in DRR education. These initiatives should be led by the Ministry of Education, with the support from the BNPB.

5.5. Partnerships between schools and other stakeholders

According to the teachers' survey, more than half of the participants think that a good partnership between the school and the council and the disaster management agency is a facilitating factor for them to implement DRR education in schools. However, a higher number of teachers still think the roles of the local council and disaster management agency are mainly for improved emergency response, when in fact they also have a role in building preparedness.

Joint preparedness activities can be in the form of developing preparedness planning together, conducting joint simulations, and for school children to raise awareness in the surrounding school community. This could be useful to increase the effectiveness of preparedness measures in schools and the surrounding community. This is also reflected in a recent study by Towers et al. (2014), where the success of children's engagement with DRR programs will likely be enhanced if there is a strong partnership between the schools and other relevant stakeholders.

Another way to strengthen partnerships is through the local DRR forum -a multi-stakeholders platform serving as a coordination mechanism to enhance multi-stakeholder collaboration and coordination. Based on personal communication with the Head of Executive Committee of Indonesia's National Platform for DRR, there are DRR forums in 19 provinces and 45 districts/ municipalities and also one national platform in Indonesia. Members of these forums could be relevant government agencies, disaster management authorities, scientific and academic institutions, NGOs, Red Cross, and private sectors (UNISDR, 2007). Schools that have DRR education programs should be part of any local DRR forum to enable dialogue and partnerships with other forum members.

Through this forum, schools can connect with members from the fire department agency, Search and Rescue, Red Cross, and many others who have specific skills and expertise related to DRR. These agencies can be invited to share their experiences and also train the students (or school personnel) on knowledge and skills on disaster preparedness.

Recommendation: Schools should be part of a local DRR forum in relevant districts or municipalities. Joint activities to enhance preparedness should also be fostered particularly between schools and local councils and disaster management agencies.

5.6. Dedicated personnel and budget

One of the facilitating factors that was identified from the survey is having dedicated personnel and a budget to implement DRR education. However, since DRR is already integrated in the curriculum, there should be no reason for teachers not to implement DRR education in schools, especially if it is a matter of lack of funding.

However, the views from the child-focused NGOs indicated that budget may not be a barrier to implement DRR education. Some agencies considered that funding is actually available in different government agencies. However, from this view, the issue is more related to a lack of understanding and technical capacity of the agency staff in implementing CCDRR (for example, engaging with children to conduct participatory risk mapping).

On the other hand, lack of funding may influence DRR activities beyond simply teaching DRR to students, as suggested by the result from the child-focus NGOs. A comprehensive package of safe schools, as illustrated by GADRRRES and UNISDR (2014), would require additional funding. This includes other interventions such as retrofitting of school buildings, disaster simulations, teachers' training, inviting experts to schools, and developing school disaster management plans.

One solution that was suggested was allocating funding from the village development funds to support DRR programs in schools. Villages in Indonesia will receive significant funding for development activities because of the new Village Law (Tempo, 2015; The Jakarta Post, 2014b). It was discussed by the child-focused NGOs that it was easier to influence people at the grass root level (i.e. village) compared to officials at higher levels, and this funding could support those efforts.

Recommendations: Budget should not be an issue since DRR is already part of the national curriculum. However, to have more comprehensive DRR activity in schools (e.g. school

retrofitting, training for teachers, school drills), schools could obtain funding could from the village funds.

5.7. Child Participation

Students and/ or community interest were factors that had little influence on teachers' views on the facilitating and deterrent factors in DRR education. This indicates that teachers seem to be indifferent to the interest (or lack of interest) from the students and/ or the community on DRR education. This perhaps illustrates a style of teaching which may be dominated by a "top down" approach, with little interest or understanding of the benefits in hearing the views from the community, including children. Some teachers (39%) also disagree with children being actively involved in preparedness planning.

This view was verified by the child-focused NGOs where children are still seen as passive participants, as indicated in many preparedness activities with children such as disaster drills or simulations and also their engagement with the Ministry of Education and the National Disaster Management Agency.

This is contradictory to the result from the children's survey which demonstrated that the vast majority were interested in learning more about DRR and assisting to ensure their schools are safer from disasters.

The UN Convention on the Rights of the Child (1989), an international treaty that recognizes the rights of children, stipulates that all children have the right for their voices to be heard, especially in the areas that will affect their safety and wellbeing. This is also in line with the Indonesian Child Protection Law (2002) where the right for children to participate is protected and also in line with the Indonesian Disaster Management Law (2007) that recognizes the right of safety and protection for every person, especially vulnerable groups, which includes children.

There are also many documented case studies and preliminary research findings which demonstrate that children's active involvement brings added value including to the resilience of the community (for examples see Back et al., 2009; Haynes & Tanner, 2015; Ronan & Johnston, 2003; UNISDR & Plan International, 2012; Webb & Ronan, 2014).

Many of the children living in Jakarta are prone to natural hazards. This is a risk to their safety and wellbeing as well as access to essential services such as health and education. Therefore, taking into account the views from the children, it is clear that DRR education in schools will enhance their rights to safety. Greater awareness is also needed among teachers

of the benefits if children actively participate in the efforts to reduce risk in their schools and homes.

Recommendations: Advantages of children's active participation in DRR should be promoted for school personnel and other education sector staff (including those in the emergency management sector).

Chapter 6

Conclusion

The information gathered from children shows us there is a strong desire for children to learn more on how to stay safe from disasters and also for them to assist their schools in becoming better prepared for disasters. However, there is still a need for children to learn more on DRR.

This study identified seven key issues on the implementation of DRR education in Indonesian schools based on the perspectives of children, school personnel and child-focused NGOs. The key issues were further analysed with the inputs from the literature review and specific recommendations made to assist teachers to improve DRR education in Indonesia.

The recommendations considered aspects of sustainability and scaling-up. Thus, a change of strategy and introduction of new measures are needed to improve the implementation of DRR education in Indonesia. These measures are:

a) Collaboration with the right units within the Ministry of Education,
b) Use of standardised and consistent key messages across all DRR education resources,
c) DRR aspects to be integrated in the school's monitoring system,
d) Change of approach in teachers' training on DRR by incorporating DRR in higher education programs,
e) Establishment of a live and online knowledge hub and discussion platform,
f) Establish a school competition at the national level,
g) Strengthening partnerships between schools with local councils and disaster management agencies by conducting joint activities,
h) The use of village funds to support a more comprehensive school-based DRR program, and
i) Promote children's active participation in DRR across sectors.

While this study focuses specifically on Indonesia, particularly Jakarta, these key issues may well be apparent in many other developing and developed countries, and the suggested recommendations may be applicable beyond Indonesia.

The tools and approaches that were used were derived from previous studies, which were predominantly based in developed countries. These were then modified to ensure that they were culturally appropriate and locally-specific for Indonesia. These tools and approaches might be replicated, extended and tailored for future research in other developing countries in order to produce a more comprehensive understanding on the barriers and challenges in the implementation of DRR education from the perspectives of various stakeholders.

6.1. Limitations of study

The study provides recommendations based on data collected from relevant stakeholders: teachers, NGOs, and children. However, information collected from the teachers was from a specific urban area. Therefore, the results and recommendations should be used with caution if being applied to different locations, taking into account the different contexts between rural, semi-urban and urban areas. Another limitation of survey research is that which is inherent to a self-report methodology, various biases that can include social desirability. Future research might include a combination of other methods within participant groups (e.g., use of both survey and focus groups within a particular stakeholder sample). On the other hand, while self-report is a limitation, a strength of this study was multi-source assessment, across the three stakeholder groups. Due to time limitations, the views and opinions of parents/ caregivers and government stakeholders were not undertaken. These stakeholder groups will be involved in future research, as described in the next section.

6.2. Areas for future research: Improving community and household preparedness through DRR education in school

Results from the survey show that children's source of DRR knowledge are from their teachers. This is in line with the findings from previous studies that illustrate teachers play an important role in DRR education (Buchanan et al., 2009; Johnson & Ronan, 2014; Shiwaku et al., 2006). However, an interesting result from the survey illustrates that the main source of knowledge of DRR is their father. Although, the main figure children discuss their daily activities with is their mother. This finding is in line with previous studies that illustrate the social construct in Indonesia where men often hold the responsibility in household preparedness; while women are often responsible for household chores and caring for and nurturing their children (Haynes et al., 2010). Furthermore, this finding strengthens the theory on the roles of families in DRR education (Ronan & Johnston, 2005; Shaw et al., 2004) and can be used to enhance the application of DRR education in general.

To date there is some preliminary evidence of DRR education resulting in changes in preparedness at the household level (Ronan et al., 2010; Ronan & Johnston, 2001, 2003). However, this research indicates that in order to improve DRR preparedness, communication needs to be stimulated and enabled to *both* parents. Investigating how DRR

education in schools can best improve this link within a family, between both parents, and all children is an extremely exciting and important area of future research.

In addition, this research suggests that there are no written preparedness plans, either at home or in schools. On the other hand, children think that they are well prepared for disasters, at home and in school. Based on the review of a bushfire disaster in 2009 in Victoria, Australia, Whittaker et al. (2013) identified that a *written* preparedness plan is extremely important even if family members have high awareness and knowledge of disaster risks.[15] These findings align with those on children's safety perceptions and the discrepancy between those perceptions and their actual level of knowledge (i.e., perceive they know what to do but only have knowledge on what to do in the low-medium range).

This research also demonstrates that children want to have written preparedness plans and be involved in the process. This perspective is in line with the teachers' perspectives as they consider children should be involved in developing preparedness plans for their homes and school.

Previous studies suggest that children can actively participate in preparedness planning and successfully reduce risks at different levels: household, school, and their local community (Back et al., 2009; Haynes et al., 2010). However, the findings from the research presented here have generated several questions:

- To what extent does DRR education impact on children's perceptions and knowledge about risk and risk reduction behaviours? This also includes their perceived knowledge (what they think they know) as opposed to what they actually know.
- Can DRR education promote children to become the driver in motivating people to have preparedness plans and practices at school, home, and their surrounding community?
- Can these preparedness plans and practices strengthen one another and thus prevent or reduce disasters and save lives?

These questions will be an area for future study in a PhD program to follow on once this Master of Research is completed.

[15] The review found that around two-thirds of households had fire plans; around half of respondents rated their preparedness as high or very high, with around 20-25% having a written plan. However, interviews with the survivor revealed considerable variation in the quality of fire plans and their effectiveness when it happened and also three-quarters wanted to be more prepared, suggesting that self-assessed levels of awareness and preparedness may be somewhat inflated.

References

ADB. (2014). Project Data Sheet: 37049-023: Integrated Citarum Water Resources Management Investment Program - Project 1. Retrieved 1 April, 2015, from http://adb.org/print/projects/37049-023/main

ADPC. (2008). *A Study on Impact of Disasters on the Education Sector in Cambodia*. Bangkok, Thailand.

AEMI. (2014). Workshop Report Disaster Resilient Australia School Education Network: Third Workshop, 24 – 25 March, 2014

Back, E., Cameron, C., & Tanner, T. (2009). Children and Disaster Risk Reduction: Taking stock and moving forward. *Children in a Changing Climate Research, UNICEF*, p20.

Baker, J. L. (2012). *Climate Change, Disaster Risk, and the Urban Poor : Cities Building Resilience for a Changing World*. Washington, DC: World Bank.

Barbour, R. S. (2010). *17. Focus Groups. The SAGE Handbook Qualitative Methods Health Research. SAGE Publications Ltd*. London: SAGE Publications Ltd.

Bartlett, S. (2008). Climate Change and Urban Children: Impacts and implications for adaptation in low-and middle-income countries. *Environment and Urbanization, 20*(2), 501-519.

Basolo, V., Steinberg, L. J., Burby, R. J., Levine, J., Cruz, A. M., & Huang, C. (2008). The Effects of Confidence in Government and Information on Perceived and Actual Preparedness for Disasters. *Environment and Behavior*. doi: 10.1177/0013916508317222

Bell, A. (2007). Designing and testing questionnaires for children. *Journal of Research in Nursing, 12*(5), 461-469. doi: 10.1177/1744987107079616

Bild, E., & Ibrahim, M. (2013). Towards the resilient future children want: a review of progress in achieving the Children's Charter for Disaster Risk Reduction (pp. 59). UK: World Vision.

Bird, D. K. (2009). The use of questionnaires for acquiring information on public perception of natural hazards and risk mitigation–a review of current knowledge and practice. *Natural Hazards and Earth System Science, 9*(4), 1307-1325.

Bird, D. K., Gísladóttir, G., & Dominey-Howes, D. (2009). Resident perception of volcanic hazards and evacuation procedures. *Natural Hazards and Earth System Science, 9*(1), 251-266.

Bird, D. K., Gísladóttir, G., & Dominey-Howes, D. (2011). Different communities, different perspectives: issues affecting residents' response to a volcanic eruption in southern Iceland. *Bulletin of volcanology, 73*(9), 1209-1227.

Bjork, C. (2004). Decentralisation in Education, Institutional Culture and Teacher Autonomy in Indonesia. *International Review of Education / Internationale Zeitschrift für Erziehungswissenschaft / Revue Internationale de l'Education, 50*(3/4), 245-262. doi: 10.2307/4151598

Black, L., & Powell, P. (2012). 4-H Teen Community Emergency Response Team (CERT). *Journal of Extension, 50*(5), 5IAW4.

BNPB. (2012). *Perka BNBP No. 4 Thn 2012 tentang Pedoman Penerapan Sekolah Aman Bencana*.

BNPB. (2013). *Pedoman Penyusunan Rencana Kontingensi Antar Lembaga Menghadapi Ancaman Bencana*

BNPB. (2014a). Data & Informasi Bencana Indonesia. Retrieved 26 December, 2014, from http://dibi.bnpb.go.id/DesInventar/dashboard.jsp?countrycode=id

BNPB. (2014b). National progress report on the implementation of the Hyogo Framework for Action (2013-2015).

Bonnerjea, L. (1994). Disasters, Family Tracing and Children's Rights: Some Questions About the Best Interests of Separated Children. *Disasters, 18*(3), 277-283. doi: 10.1111/j.1467-7717.1994.tb00313.x

BPS. (2014). Statistik Daerah Provinsi DKI Jakarta 2014. http://jakarta.bps.go.id/flip/statda2014/index.html

BPS. (2015). Jakarta In Figures 2014. http://jakarta.bps.go.id/index.php?bWVudT0xOTAwJnBhZ2U9cmFrYnVrdQ==

Brown, D., & Dodman, D. (2014). *Understanding children's risk and agency in urban areas and their implications for child-centred urban disaster risk reduction in Asia: Insights from Dhaka, Kathmandu, Manila and Jakarta*

Bryant, A., & Charmaz, K. (2007a). *The Coding Process and Its Challenges. The SAGE Handbook of Grounded Theory. SAGE Publications Ltd*. London, England: SAGE Publications Ltd.

Bryant, A., & Charmaz, K. (2007b). *Grounded Theory in Historical Perspective: An Epistemological Account. The SAGE Handbook of Grounded Theory. SAGE Publications Ltd*. London, England: SAGE Publications Ltd.

Buchanan, T., Casbergue, R., & Baumgartner, J. (2009). Young Children's Demonstrated Understanding of Hurricanes. In K. E. Cherry (Ed.), *Lifespan Perspectives on Natural Disasters* (pp. 3-26): Springer US.

Burnham, J. J., Hooper, L. M., Edwards, E. E., Tippey, J. M., McRaney, A. C., Morrison, M. A., . . . Woodroof, E. K. (2008). Examining Children's Fears in the Aftermath of Hurricane Katrina. *Journal of Psychological Trauma, 7*(4), 253-275. doi: 10.1080/19322880802492229

Chang, M. C., Shaeffer, S., Al-Samarrai, S., Ragatz, A. B., de Ree, J., & Stevenson, R. (2013). *Teacher reform in Indonesia : the role of politics and evidence in policy making* Vol. 1. *Main report* Retrieved from http://documents.worldbank.org/curated/en/2013/11/18606227/teacher-reform-indonesia-role-politics-evidence-policy-making

Chaussard, E., Amelung, F., & Abidin, H. Z. (2011, 19–23 September 2011). *Sinking Cities in Indonesia: Space-Geodetic Evidence of the Rates and Spatial Distribution of Land Subsidence.* Paper presented at the Fringe 2011 Workshop, Frascati, Italy.

Children in a Changing Climate. (2011). Children's Charter for Disaster Risk Reduction. https://plan-international.org/files/global/publications/emergencies/Childrens_Charter%20new.pdf

Clerveaux, V., & Spence, B. (2009). The communication of disaster information and knowledge to children using game technique: The disaster awareness game (DAG).

Clerveaux, V., Spence, B., & Katada, T. (2010). Promoting disaster awareness in multicultural societies: the DAG approach. *Disaster Prevention and Management: An International Journal, 19*(2), 199-218. doi: doi:10.1108/09653561011038002

Coomer, M. A., Johnston, D. M., Edmonson, L., Monks, D., Pedersen, S., & Rodger, A. (2008). Emergency Management in Schools – Wellington Survey *GNS Science Report* (pp. 32).

Csáky, C. (2008). No one to turn to. The under-reporting of child sexual exploitation and abuse by aid workers and peacekeepers.

Dee, T. S. (1998). Competition and the quality of public schools. *Economics of Education Review, 17*(4), 419-427. doi: http://dx.doi.org/10.1016/S0272-7757(97)00040-X

Demographia. (2015). Demographia World Urban Areas: 11th Annual Edition: 2015: 01.

Dickson, E., Baker, J. L., Hoornweg, D., & Tiwari, A. (2012). Urban risk assessments : understanding disaster and climate risk in cities. *Urban development series*. http://documents.worldbank.org/curated/en/2012/06/16499064/urban-risk-assessments-understanding-disaster-climate-risk-cities

Dicky, M., Haerani, E., Shibayama, M., Ueshima, M., Kagawa, N., & Hirnawan, F. (2015). Disaster Awareness Education for Children in Schools Around Geological Hazard Prone Areas in Indonesia. In G. Lollino, D. Giordan, K. Thuro, C. Carranza-Torres, F. Wu, P. Marinos & C. Delgado (Eds.), *Engineering Geology for Society and Territory - Volume 6* (pp. 107-111): Springer International Publishing.

Dinas Pemadam Kebakaran & Penanggulangan Bencana. (n.d.). Mencegah Kebakaran. Retrieved 27 December, 2014, from http://www.jakartafire.net/pengetahuan/index.php?act=detil&idb=397

Direktorat Jendral Pendidikan Dasar. (2014). Visi dan Misi. Retrieved 15 March 2015, from http://dikdas.kemdikbud.go.id/index.php/visi-dan-misi/

Direktorat Jendral Pendidikan Dasar. (2015). Lomba Sekolah Sehat Kembali Dihelat. Retrieved 15 March 2015, 2015, from http://www.usahakesehatansekolah.com/berita/lomba-sekolah-sehat-kembali-dihelat

Djalante, R., & Thomalla, F. (2012). Disaster risk reduction and climate change adaptation in Indonesia. *International Journal of Disaster Resilience in the Built Environment, 3*(2), 166-180. doi: doi:10.1108/17595901211245260

Education Cluster. (2013). Education Needs Assessment Report on Jakarta Flood, 16-27 January 2013. Jakarta.

Edwards, M., & Hulme, D. (1995). NGO performance and accountability in the post-cold war world. *Journal of International Development, 7*(6), 849-856. doi: 10.1002/jid.3380070604

EMDAT. (2014). Natural Disaster Trends. Retrieved 28 September, 2014, from http://www.emdat.be/natural-disasters-trends

Emmel, N. (2013). *The Basics of Realist Sampling. Sampling and Choosing Cases in Qualitative Research: A Realist Approach. SAGE Publications Ltd.* London: SAGE Publications Ltd.

Enarson, E. (1999). Violence Against Women in Disasters: A Study of Domestic Violence Programs in the United States and Canada. *Violence Against Women, 5*(7), 742-768. doi: 10.1177/10778019922181464

Falkiner, L. (2003). Impact analysis of the Expect the Unexpected program. Toronto: Institute for Catastrophic Loss Reduction.

Fernandez, G., & Shaw, R. (2015). Youth participation in disaster risk reduction through science clubs in the Philippines. *Disasters, 39*(2), 279-294. doi: 10.1111/disa.12100

Finnis, K. K., Johnston, D. M., Ronan, K. R., & White, J. D. (2010). Hazard perceptions and preparedness of Taranaki youth. *Disaster Prevention and Management: An International Journal, 19*(2), 175-184. doi: doi:10.1108/09653561011037986

Frau, E., Midoro, V., & Pedemonte, G. M. (1992). Do Hypermedia Systems Really Enhance Learning? A Case Study on Earthquake Education. *Innovations in Education & Training International, 29*(1), 42-51. doi: 10.1080/0954730920290106

Frederick, W. H., & Worden, R. L. (1992). *Indonesia: A country study* (Vol. 550): Government Printing Office.

GADRRRES, & UNISDR. (2014). Comprehensive School Safety - A global framework in support of The Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector and The Worldwide Initiative for Safe Schools, in preparation for the 3rd U.N. World Conference on Disaster Risk Reduction, 2015.

Gaillard, J. C., & Pangilinan, M. L. C. J. D. (2010). Participatory Mapping for Raising Disaster Risk Awareness Among the Youth. *Journal of Contingencies and Crisis Management, 18*(3), 175-179. doi: 10.1111/j.1468-5973.2010.00614.x

Gallagher, M. (2009). 3 Data Collection and Analysis *Researching with Children and Young People: Research Design, Methods and Analysis* (pp. 65-77). London: SAGE Publications Ltd.

Gautam, D., & Oswald, K. (2008). Child Voices: Children of Nepal speak out on climate change adaptation. *Children in a Changing Climate Research*.

Government of Indonesia. (2002). Child Protection Law, Law no. 23 Year 2002. http://www.depkop.go.id/attachments/article/1465/02.%20UU%20No.%2023%20Tahun%202002%20tentang%20Perlindungan%20Anak.pdf

Government of Indonesia. (2007). Disaster Management Law, Law No. 24 Year 2007. http://www.itjen.depkes.go.id/public/upload/unit/pusat/files/Undang-undang/UU_No__24_Th_2007_ttg_Penanggulangan_Bencana.pdf

Greig, A. D., Taylor, J., & MacKay, T. (2012). *Doing research with children: A practical guide*: Sage.

Gulay, H. (2010). An Earthquake Education Program with Parent Participation for Preschool Children. *Educational Research and Reviews, 5*(10), 624-630.

Hanushek, E. A., & Rivkin, S. G. (2003). Does public school competition affect teacher quality? *The economics of school choice* (pp. 23-48): University of Chicago Press.

Hartmann, A., & Linn, J. F. (2007). Scaling up: A path to effective development. *About IFPRI and the 2020 Vision Initiative*, 549.

Haynes, K., Barclay, J., & Pidgeon, N. (2008). Whose reality counts? Factors affecting the perception of volcanic risk. *Journal of Volcanology and Geothermal Research, 172*(3), 259-272.

Haynes, K., Lassa, J., & Towers, B. (2010). The influence of risk, gender and religion on child-centred disaster risk reduction. *Children in a Changing Climate working paper 2. Institute of Development Studies, Brighton*.

Haynes, K., & Tanner, T. M. (2015). Empowering young people and strengthening resilience: youth-centred participatory video as a tool for climate change adaptation and disaster risk reduction. *Children's Geographies, 13*(3), 357-371. doi: 10.1080/14733285.2013.848599

Hilyard, K. M., Hocke, T. M., & Ryan, E. L. (2011). Disaster on the web? A qualitative analysis of disaster preparedness websites for children. *PRism, 8*(2), 1-18.

Hoxby, C. M. (2003). School choice and school competition: Evidence from the United States. *Swedish Economic Policy Review, 10*(2), 9-66.

IFRC. (2013). Public awareness and public education for disaster risk reduction: key message. http://www.ifrc.org/PageFiles/103320/Key-messages-for-Public-awareness-guide-EN.pdf

IFRC. (2014). *World Disasters Report 2014*. Geneva: IFRC.

Indonesian Red Cross. (2009). *Sekolahku Aman, Bersih, dan Sehat*

INEE. (2010). Talking Points: Education in Emergencies, INEE and the INEE Minimum Standards. http://toolkit.ineesite.org/toolkit/INEEcms/uploads/1114/Talking_Points_Ed_in_Emergencies.pdf

International Recovery Platform. (2014). Past PDNAs & recovery frameworks. Retrieved 28 November, 2014, from http://www.recoveryplatform.org/pdna/key_documents/past_pdnas_and_recovery_frameworks

Izadkhah, Y., & Heshmati, V. (2007). *Applicable methods in teaching earthquakes to preschool children.* Paper presented at the Proceedings of fifth international conference on seismology and earthquake engineering, Iran.

Jang, S., Johnson, B., & Kim, Y. (2011). Eagle scouts: Merit beyond the badge. *Waco, TX: Boy Scouts of America*.

Jia, Z., Tian, W., He, X., Liu, W., Jin, C., & Ding, H. (2010). Mental health and quality of life survey among child survivors of the 2008 Sichuan earthquake. *Quality of Life Research, 19*(9), 1381-1391. doi: 10.1007/s11136-010-9703-8

Johnson, V. A. (2011). *Disaster preparedness education in schools: Recommendations for New Zealand and the United States*: Fulbright New Zealand Wellington.

Johnson, V. A., Johnston, D. M., Ronan, K. R., & Peace, R. (2014a). Evaluating Children's Learning of Adaptive Response Capacities from ShakeOut, an Earthquake and Tsunami Drill in Two Washington State School Districts. *Journal of Homeland Security and Emergency Management, 0*(0). doi: 10.1515/jhsem-2014-0012

Johnson, V. A., & Ronan, K. R. (2014). Classroom responses of New Zealand school teachers following the 2011 Christchurch earthquake. *Natural Hazards, 72*(2), 1075-1092. doi: 10.1007/s11069-014-1053-3

Johnson, V. A., Ronan, K. R., Johnston, D. M., & Peace, R. (2014b). Evaluations of disaster education programs for children: A methodological review. *International Journal of Disaster Risk Reduction, 9*, 107-123. doi: 10.1016/j.ijdrr.2014.04.001

Johnson, V. A., Ronan, K. R., Johnston, D. M., & Peace, R. (2014c). Implementing disaster preparedness education in New Zealand primary schools. *Disaster Prevention and Management, 23*(4), 370-380. doi: 10.1108/dpm-09-2013-0151

Johnston, D., Becker, J., Coomer, M., Ronan, K. R., Davis, M., & Gregg, C. (2006). Children's risk perceptions and preparedness: Mt Rainier 2006 hazard education assessment tabulated results.

Johnston, D., Tarrant, R., Tipler, K., Coomer, M., Pedersen, S., & Garside, R. (2011). Preparing Schools for Future Earthquakes in New Zealand: Lessons from an Evaluation of a Wellington School Exercise. *Australian Journal of Emergency Management, The, 26*(1).

Kapucu, N. (2008). Culture of preparedness: household disaster preparedness. *Disaster Prevention and Management: An International Journal, 17*(4), 526-535. doi: doi:10.1108/09653560810901773

King, D. (2000). You're on Your Own: Community Vulnerability and the Need for Awareness and Education for Predicatable Natural Disasters. *Journal of Contingencies and Crisis Management, 8*(4), 223-228. doi: 10.1111/1468-5973.00143

Kitzinger, J. (1995). *Qualitative Research: Introducing focus groups* (Vol. 311).

Kline, P. (2013). *Handbook of psychological testing*: Routledge.

Krosnick, J. A., Holbrook, A. L., Berent, M. K., Carson, R. T., Michael Hanemann, W., Kopp, R. J., . . . Conaway, M. (2002). The Impact of "No Opinion" Response Options on Data Quality: Non-Attitude Reduction or an Invitation to Satisfice? *Public Opinion Quarterly, 66*(3), 371-403. doi: 10.1086/341394

Krueger, R. A., & Casey, M. A. (2015). Participants in a Focus Group *Focus Groups A Practical Guide for Applied Research* (5 ed., pp. 280).

Kurita, T., Nakamura, A., Kodama, M., & Colombage, S. R. N. (2006). Tsunami public awareness and the disaster management system of Sri Lanka. *Disaster Prevention and Management: An International Journal, 15*(1), 92-110. doi: doi:10.1108/09653560610654266

Kvale, S. (2007). *Introduction to interview research. Doing Interviews. SAGE Publications, Ltd* (S. Kvale Ed.). London, England: SAGE Publications, Ltd.

Lauten, A. W., & Lietz, K. (2008). A look at the standards gap: Comparing child protection responses in the aftermath of Hurricane Katrina and the Indian Ocean tsunami. *Children Youth and Environments, 18*(1), 158-201.

Lopez, Y., Hayden, J., Cologon, K., & Hadley, F. (2012). Child participation and disaster risk reduction. *International Journal of Early Years Education, 20*(3), 300-308.

Manawiyah (2014, 8 December 2014). [Experience of SDN Kembangan Selatan 01 & 02 on floods].

Mardis, M., Hoffman, E., & Rich, P. (2014). Trends and Issues in Qualitative Research Methods. In J. M. Spector, M. D. Merrill, J. Elen & M. J. Bishop (Eds.), *Handbook of Research on Educational Communications and Technology* (pp. 173-193): Springer New York.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*: Sage.

Ministry of Education and Culture. (2012). Indonesia Educational Statistics in Brief 2011/2012.

Ministry of Education of Indonesia. (2010). Pengarusutamaan Pengurangan Risiko Bencana di Sekolah, Surat Edaran Menteri No. 70A/MPN/SE/2010. https://gerashiaga.files.wordpress.com/2012/06/surat-edaran-mendiknas-no-70a_mpn_se_2010.pdf

Ministry of Education of Indonesia. (2013). 10 Ribu Sekolah Terhubung Koneksi Internet Nirkabel. http://www.kemdiknas.go.id/kemdikbud/node/1355

Mitchell, P., & Borchard, C. (2014). Mainstreaming children's vulnerabilities and capacities into community-based adaptation to enhance impact. *Climate and Development*(ahead-of-print), 1-10.

Mitchell, T., Haynes, K., Hall, N., Choong, W., & Oven, K. (2008). The roles of children and youth in communicating disaster risk. *Children Youth and Environments, 18*(1), 254-279.

Mitchell, T., Tanner, T., & Haynes, K. (2009). Children as agents of change for Disaster Risk Reduction: Lessons from El Salvador and the Philippines.

Molina, G., Molina, F., & Tanner, T. (2009). Child-friendly participatory research tools. *Community-based adaptation to climate change*, 160.

Morgan, D. L. (2012). *Focus Groups and Social Interaction. The SAGE Handbook of Interview Research: The Complexity of the Craft. SAGE Publications, Inc*. Thousand Oaks, CA: SAGE Publications, Inc.

Moser, S. (2015). Educating the nation: shaping student-citizens in Indonesian schools. *Children's Geographies*, 1-16. doi: 10.1080/14733285.2015.1033614

Naya, Y. (2007). How Intercultural Disaster Reduction Education Change Students: A Case Study of an Evening Course Senior High School in Hyogo, Japan. In T. Ishida, S. Fussell & P. J. M. Vossen (Eds.), *Intercultural Collaboration* (Vol. 4568, pp. 368-381): Springer Berlin Heidelberg.

Ng, A. H.-M., Ge, L., Li, X., Abidin, H. Z., Andreas, H., & Zhang, K. (2012). Mapping land subsidence in Jakarta, Indonesia using persistent scatterer interferometry (PSI) technique with ALOS PALSAR. *International Journal of Applied Earth Observation and Geoinformation, 18*(0), 232-242. doi: http://dx.doi.org/10.1016/j.jag.2012.01.018

Nishikiori, N., Abe, T., Costa, D. G., Dharmaratne, S. D., Kunii, O., & Moji, K. (2006). Who died as a result of the tsunami?–Risk factors of mortality among internally displaced persons in Sri Lanka: a retrospective cohort analysis. *BMC Public Health, 6*(1), 73.

Norris, F. H., Friedman, M. J., Watson, P. J., Byrne, C. M., Diaz, E., & Kaniasty, K. (2002). 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. *Psychiatry: Interpersonal and biological processes, 65*(3), 207-239.

OECD/Asian Development Bank. (2015). *Education in Indoensia: Rising to the challenge*. Paris: OECD Publishing.

Ollendick, T. H. (1983). Reliability and validity of the revised fear survey schedule for children (FSSC-R). *Behaviour Research and Therapy, 21*(6), 685-692. doi: http://dx.doi.org/10.1016/0005-7967(83)90087-6

Ollendick, T. H., Matson, J. L., & Helsel, W. J. (1985). Fears in children and adolescents: normative data. *Behaviour Research and Therapy, 23*(4), 465-467. doi: http://dx.doi.org/10.1016/0005-7967(85)90174-3

Pane, J. F., McCaffrey, D. F., Kalra, N., & Zhou, A. J. (2008). Effects of Student Displacement in Louisiana During the First Academic Year After the Hurricanes of 2005. *Journal of Education for Students Placed at Risk (JESPAR), 13*(2-3), 168-211. doi: 10.1080/10824660802350169

Parker, A., & Tritter, J. (2006). Focus group method and methodology: current practice and recent debate. *International Journal of Research & Method in Education, 29*(1), 23-37. doi: 10.1080/01406720500537304

Paton, D., Smith, L., Daly, M., & Johnston, D. (2008). Risk perception and volcanic hazard mitigation: Individual and social perspectives. *Journal of Volcanology and Geothermal Research, 172*(3), 179-188.

Peek, L. (2008). Children and disasters: Understanding vulnerability, developing capacities, and promoting resilience-an introduction. *Children Youth and Environments, 18*(1), 1-29.

Peek, L., & Fothergill, A. (2014). Post-Disaster Decline: Understanding Children's Vulnerability Before, During, and After Katrina. *The Dialogue, 10*(3), 2-4. http://wsnet.colostate.edu/CWIS584/Lori_Peek/Data/Sites/1/1-research/publicationpdfs/peekandfothergill-dialogue2014-vol10-issue3.pdf

Petal, M., & Sanduvac, Z. T. (2012). DREAMS for Turkey: A Case Study of Scale and Reach of Distance-Learning Self-Study for Individual and Household Preparedness and School Disaster Management.

Phillips, D. C. (1990). Subjectivity and objectivity: An objective inquiry. *Qualitative inquiry in education: The continuing debate*, 19-37.

Plan International. (2010a). *Child-Centred DRR Toolkit*.

Plan International. (2010b). Child Centred Disaster Risk Reduction: Building Resilience through Participation *Lessons from Plan International*. London, UK.

Plan International. (2011). *Weathering the storm: Adolescent girls and climate change*. Woking.

Plan International. (2012b). *Impact of Climate Change on Children in Nepal*: Plan Nepal.

Plan International. (2013). Enhancing Child-centered Disaster Risk Reduction for Safe Schools: Insights from Cambodia, China and Indonesia (pp. 137pp). Bangkok: Plan International Asia Regional Office.

Plush, T. (2009). Amplifying children's voices on climate change: the role of. *Community-based adaptation to climate change, 60*, 119.

Polda Metro Jaya. (n.d.). Tips Menghadapi Banjir. Retrieved 27 December, 2014, from http://www.metro.polri.go.id/tips-menghadapi-bahaya-banjir

Powell, P., Smith, M., & Black, L. (2011). 4-H Teen CERT An Evaluation of a Two-Day Nevada Training. *Univ Nevada Cooperative Extension*.

PreventionWeb. (2015). Educational Materials. Retrieved 26 February, 2015, from http://www.preventionweb.net/english/professional/trainings-events/edu-materials/

Pusat Kurikulum. (2009). *Modul Pelatihan Pengintegrasian Pengurangan Risiko Bencana ke dalam Sistem Pendidikan: Jenjang Pendidikan Dasar dan Menengah*

Redlener, I. E., DeRosa, C., & Parisi, K. (2010). Legacy of Katrina: The Impact of a Flawed Recovery on Vulnerable Children of the Gulf Coast.

Ronan, K. R. (2014). Advances and Continuing Challenges towards HFA2 and Post-2015: Background Chapter. *Background Paper Prepared for the 2015 Global Assessment Report on Disaster Risk Reduction*. http://www.preventionweb.net/english/hyogo/gar/2015/en/bgdocs/UNICEF%20and%20UNESCO,%202014.pdf

Ronan, K. R. (2015). Child-centred disaster risk reduction program of research: Review and scoping.

Ronan, K. R., Crellin, K., & Johnston, D. (2010). Correlates of hazards education for youth: a replication study. *Natural Hazards, 53*(3), 503-526.

Ronan, K. R., Crellin, K., & Johnston, D. (2012). Community readiness for a new tsunami warning system: quasi-experimental and benchmarking evaluation of a school education component. *Natural Hazards, 61*(3), 1411-1425. doi: 10.1007/s11069-011-0070-8

Ronan, K. R., & Johnston, D. M. (2001). Correlates of hazard education programs for youth. *Risk Analysis, 21*(6), 1055-1064.

Ronan, K. R., & Johnston, D. M. (2003). Hazards Education for Youth: A Quasi-Experimental Investigation. *Risk Analysis, 23*(5), 1009-1020.

Ronan, K. R., & Johnston, D. M. (2005). *Promoting community resilience in disasters*: Springer.

Ronan, K. R., Johnston, D. M., Daly, M., & Fairley, R. (2001). School children's risk perceptions and preparedness: A hazards education survey. *Australasian Journal of Disaster and Trauma Studies, 1*, 2001-2001.

Sagala, S., Lassa, J., Yasaditama, H., & Hudalah, D. (2013). The evolution of risk and vulnerability in Greater Jakarta: contesting government policy: Working Paper, Institute for Resource Governance and Social Change.

Save the Children. (2007a). *Advocacy Matters: Helping children change their world - Participants Manual*. London, UK: The International Save the Children Alliance.

Save the Children. (2007b). Pedoman Pelatihan: Pengurangan Risiko Bencana yang Dimotori oleh Anak-anak di Sekolah dan Komunitas.

Save the Children. (2008). Legacy of disasters: The impact of climate change on children. http://www.savethechildren.org.uk/sites/default/files/docs/legacy-of-disasters_1.pdf

Sayer, R. A. (1992). *Method in social science : a realist approach* (2nd ed. ed.). London: London : Routledge.

Seballos, F., & Tanner, T. (2009). The Importance of Participatory Child-Centred Research for Climate Adaptation.

Seballos, F., & Tanner, T. (2011). Enabling child-centred agency in disaster risk reduction. *Geneva: Global Assessment Report on Disaster Risk Reduction. UNISDR*.

Server, O. B. (1996). Corruption: A major problem for urban management: Some evidence from Indonesia. *Habitat International, 20*(1), 23-41. doi: http://dx.doi.org/10.1016/0197-3975(95)00032-1

Sety, M. (2012). Domestic Violence and Natural Disasters. http://www.adfvc.unsw.edu.au/PDF%20files/Thematic%20Review_3.pdf

Shaw, R., Kobayashi, K. S. H., & Kobayashi, M. (2004). Linking experience, education, perception and earthquake preparedness. *Disaster Prevention and Management, 13*(1), 39-49.

Shimura, T., & Yamagata, K. (2015). The Great East Japan Disaster and Geography Education: School Damage, Associations' Support Project, and Trends in Geography Teaching Practices. In Y. Ida, M. Yuda, T. Shimura, S. Ike, K. Ohnishi & H. Oshima (Eds.), *Geography Education in Japan* (Vol. 3, pp. 221-233): Springer Japan.

Shiwaku, K., & Shaw, R. (2008). Proactive co-learning: A new paradigm in disaster education. *Disaster Prevention and Management, 17*(2), 183-198.

Shiwaku, K., Shaw, R., Chandra Kandel, R., Narayan Shrestha, S., & Mani Dixit, A. (2007). Future perspective of school disaster education in Nepal. *Disaster Prevention and Management: An International Journal, 16*(4), 576-587. doi: doi:10.1108/09653560710817057

Shiwaku, K., Shaw, R., Kandel, R. C., Shrestha, S. N., & Dixit, A. M. (2006). Promotion of disaster education in Nepal: The role of teachers as change agents. *International Journal of Mass Emergencies and Disasters, 24*(3), 403.

Sinclair, M. (2001). Education in emergencies. *Learning for a future: Refugee education in developing countries*, 1-84.
Smith, M. (2011). Training youth to prepare communities for disasters.
Soffer, Y., Goldberg, A., Avisar-Shohat, G., Cohen, R., & Bar-Dayan, Y. (2010). The effect of different educational interventions on schoolchildren's knowledge of earthquake protective behaviour in Israel. *Disasters, 34*(1), 205-213.
Steinberg, F. (2007). Jakarta: Environmental problems and sustainability. *Habitat International, 31*(3–4), 354-365. doi: http://dx.doi.org/10.1016/j.habitatint.2007.06.002
Sudjana, N. (2006). Standar Mutu Pengawas. https://nasuprawoto.files.wordpress.com/2010/10/standard-mutu-pengawas.doc
Sulfasyah. (2013). *Investigating the Implementation of the Indonesian KTSP (School-Based Curriculum) in the Teaching of Writing in Year Two.* (Doctor of Philosophy), Edith Cowan University, Perth.
Swiss Re. (2014). Mind the risk - A global ranking of cities under threat from natural disasters.
Tadjoeddin, M. Z. (1990). Anatomy of Social Violence in the Context of Transition: The Case of Indonesia 1990-2001. *ANATOMY OF SOCIAL VIOLENCE IN THE CONTEXT OF TRANSITION: THE CASE OF INDONESIA, July-December 2002*.
Tanner, T. (2010). Shifting the Narrative: Child-led Responses to Climate Change and Disasters in El Salvador and the Philippines. *Children & Society, 24*(4), 339-351.
Tanner, T., Garcia, M., Lazcano, J., Molina, F., Molina, G., Rodriguez, G., . . . Fran, S. (2009). Children's participation in community-based disaster risk reduction and adaptation to climate change. *Participatory learning and action, 60*, 54.
Telford, J., Cosgrave, J., & Houghton, R. (2006). Joint evaluation of the international response to the Indian Ocean tsunami. *Synthesis Report*.
Tempo. (2015, 14 January 2015). Govt to Disburse Village Funds. *Tempo*. Retrieved from http://en.tempo.co/read/news/2015/01/14/056634773/Govt-to-Disburse-Village-Funds
The Jakarta Post. (2012, 4 January 2012). Jakarta drafts contingency plan to curb disaster risks. *The Jakarta Post,*. Retrieved from http://www.thejakartapost.com/news/2012/01/04/jakarta-drafts-contingency-plan-curb-disaster-risks.html
The Jakarta Post. (2014a, 29 Nov 2014). BNPB wait for governor to act on flooding. *The Jakarta Post,* p. 9. Retrieved from http://www.thejakartapost.com/news/2014/11/29/bnpb-wait-governor-act-flooding.html
The Jakarta Post. (2014b, 21 August 2014). Editorial: Budget allocation to villages. *The Jakarta Post*. Retrieved from http://www.thejakartapost.com/news/2014/08/21/editorial-budget-allocation-villages.html
The Jakarta Post. (2015a, 28 January 2015). Jakarta's budget focuses on education, flood mitigation. Retrieved from http://www.thejakartapost.com/news/2015/01/28/jakarta-s-budget-focuses-education-flood-mitigation.html
The Jakarta Post. (2015b, 18 February 2015). Let's face it, the flooding won't end anytime soon. *The Jakarta Post,*. Retrieved from http://www.thejakartapost.com/news/2015/02/18/let-s-face-it-flooding-won-t-end-anytime-soon.html
Towers, B. (2015). Children's knowledge of bushfire emergency response. *International Journal of Wildland Fire, 24*(2), 179-189. doi: http://dx.doi.org/10.1071/WF13153
Towers, B., Haynes, K., Sewell, F., Bailie, H., & Cross, D. (2014). Child-centred disaster risk reduction in Australia: Progress, gaps and opportunities. *AUSTRALIAN JOURNAL OF EMERGENCY MANAGEMENT, 29*(1), 31.
TR Ministry of Education, Boğaziçi University, Kandilli Observatory, & Earthquake Research Institute. (n.d.). Basic disaster awareness in Turkish schools 2001-2005: Final report. http://ztscompany.com/Assets/reports/TR%20SCHOOLS%20FINAL%20REPORT.pdf
UNESCO. (2014). *Stay safe and be prepared: A teacher's guide to disaster risk reduction* Compendium on Disaster Risk Reduction (DRR), Retrieved from http://www.preventionweb.net/english/professional/trainings-events/edu-materials/v.php?id=41761

UNESCO, & UNICEF. (2012). Disaster risk reduction in school curricula: case studies from thirty countries *Disaster risk reduction in school curricula: case studies from thirty countries*: United Nations Children's Fund (UNICEF); United Nations Educational, Scientific and Cultural Organization (UNESCO).

UNHCR, & Save the Children. (2002). Sexual Violence & Exploitation: The Experience of Refugee Children in Guinea, Liberia and Sierra Leone.

UNICEF. (1996). The State of the World's Children 1996 - Statistical Tables. http://www.unicef.org/sowc96/stats.htm

UNICEF. (2012). UNICEF and Child-Centred Disaster Risk reduction. http://www.unicefinemergencies.com/downloads/eresource/docs/DRR/Child-centred%20DRR.pdf

UNICEF. (2014a). Child-centred Risk Assessment: Regional Synthesis of UNICEF Assessments in Asia. Kathmandu, Nepal: UNICEF ROSA,.

UNICEF. (2014b). *The state of the world's children 2014 in numbers: Every child counts*.

UNISDR. (2004). *Living with risk: a global review of disaster reduction initiatives*. Geneva, Switzerland.

UNISDR. (2005). *Hyogo framework for action 2005-2015: building the resilience of nations and communities to disasters.* Paper presented at the Extract from the final report of the World Conference on Disaster Reduction (A/CONF. 206/6).

UNISDR. (2007). Guidelines National Platforms for Disaster Risk Reduction. http://www.unisdr.org/files/601_engguidelinesnpdrr.pdf

UNISDR. (2008). Disaster Prevention for Schools: Guidance for Education Sector Decision-Makers, Consultation version, November 2008. http://www.unisdr.org/files/7556_7344DPforSchoolssm1.pdf

UNISDR. (2012). *Making Cities Resilient Report 2012, My city is getting ready !: A global snapshot of how local governments reduce disaster risk*.

UNISDR. (2014). Economic losses over $100 bn for 4th year. http://www.unisdr.org/archive/38389

UNISDR. (2015a). Commitments to Safe Schools: Summary Report. Geneva: UNISDR.

UNISDR. (2015b). *Making Development Sustainable: The Future of Disaster Risk Management. Global Assessment Report on Disaster Risk Reduction*. Geneva, Switzerland: United Nations Office for Disaster Risk Reduction (UNISDR).

UNISDR. (2015c). Sendai Framework for Disaster Risk Reduction 2015-2030. http://www.wcdrr.org/uploads/Sendai_Framework_for_Disaster_Risk_Reduction_2015-2030.pdf

UNISDR, & Plan International. (2012). Children's Action for Disaster Risk Reduction: Views from Children in Asia. Bangkok, Thailand.

United Nations. (1989). Convention on the Rights of the Child. www.unicef.org/crc/

United Nations. (2014). *The Millennium Development Goals Report 2014* (T. Too-Kong Ed.).

United Nations, D. o. E. a. S. A., Population Division,. (2013). World Population Prospects: The 2012 Revision, DVD Edition.

US National Commission on Children and Disasters. (2010). *2010 Report to the President and Congress*. Rockville, MD: Agency for Healthcare Research and Quality.

Vernez, G., Karam, R., & Marshall, J. (2012). *Implementation of school-based management in Indonesia* (Vol. 1). Jakarta: World Bank.

Wachtendorf, T., Brown, B., & Nickle, M. C. (2008). Big bird, disaster masters, and high school students taking charge: The social capacities of children in disaster education. *Children Youth and Environments, 18*(1), 456-469.

Watts, M. (2006). Essentials for Research Design: In Search of the Holy Grail: Projects, Proposals, and Research Design, but Mostly About Why Writing a Dissertation Proposal Is So Difficult. A Handbook for Social Science Field Research: Essays & Bibliographic Sources on Research Design and Methods. SAGE Publications, Inc (pp. 175-197). Thousand Oaks, CA: SAGE Publications, Inc.

Webb, M., & Ronan, K. R. (2014). Interactive Hazards Education Program for Youth in a Low SES Community: A Quasi-Experimental Pilot Study. *Risk Analysis, 34*(10), 1882-1893.

Whittaker, J., & Handmer, J. (2010). Community Bushfire Safety: A Review of Post-black Saturday Research *Australian Journal of Emergency Management, The, 25*(4).

Whittaker, J., Haynes, K., Handmer, J., & McLennan, J. (2013). Community safety during the 2009 Australian 'Black Saturday' bushfires: an analysis of household preparedness and response. *International Journal of Wildland Fire, 22*(6), 841-849. doi: http://dx.doi.org/10.1071/WF12010

WHO. (2005). *Communicable disease control in emergencies: A Field Manual*.

WHO. (2011). Disaster Risk Management for Health Fact Sheets: Child Health. http://www.who.int/entity/hac/events/drm_fact_sheet_child_health.pdf?ua=1

WHO. (2013). TECHNICAL NOTES ON DRINKING-WATER, SANITATION AND HYGIENE IN EMERGENCIES: Hygiene promotion in emergencies. http://www.who.int/entity/water_sanitation_health/publications/2011/WHO_TN_10_Hygiene_promotion_in_emergencies.pdf

Wisner, B., Blaikie, P., Cannon, T., & Davis, I. (2004). *At risk: natural hazards, people's vulnerability and disasters* (2nd ed.). USA & Canada: Routledge.

World Bank. (2014a). Jakarta Urgent Flood Mitigation Project/Jakarta Emergency Dredging Initiative Project. Retrieved 1 April, 2015, from http://www.worldbank.org/en/results/2014/09/10/jakarta-emergency-dredging-initiative-project.print

World Bank. (2014b). World Bank and Education in Indonesia. Retrieved 13 July, 2015, from http://www.worldbank.org/en/country/indonesia/brief/world-bank-and-education-in-indonesia

Wößmann, L. (2007). International Evidence on School Competition, Autonomy, and Accountability: A Review. *Peabody Journal of Education, 82*(2-3), 473-497. doi: 10.1080/01619560701313176

Zahran, S., Peek, L., & Brody, S. D. (2008). Youth Mortality by Forces of Nature. *Children, Youth and Environments, 18*(1), 371-388. doi: 10.7721/chilyoutenvi.18.1.0371

Appendix A

Teacher and school principal questionnaire

Participant information

Your answers are anonymous and your name will not be identified with your responses. Your name here is for tracking purposes only.

Full Name:	Age:
Gender: Male / Female	Occupation:
Name of school:	School address:
Number of teachers:	Number of education personnel:
Number of students:	

1. Please read each of the following statement and decide how much you agree with each

I think …	Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly agree
Children have an important role in disaster preparedness	☐	☐	☐	☐	☐	☐	☐
Involving children in disaster preparedness will put them at greater risk	☐	☐	☐	☐	☐	☐	☐
Involving children in disaster preparedness will provide benefits for the children	☐	☐	☐	☐	☐	☐	☐
Involving children in disaster preparedness will strengthen the preparedness plan	☐	☐	☐	☐	☐	☐	☐
I am confident to involve children in the disaster preparedness process	☐	☐	☐	☐	☐	☐	☐
Children should be involved in disaster simulations and response exercises	☐	☐	☐	☐	☐	☐	☐
Children should be involved when developing preparedness planning at **home**	☐	☐	☐	☐	☐	☐	☐
Children should be involved when developing preparedness planning at **school**	☐	☐	☐	☐	☐	☐	☐
Children should be involved when developing preparedness planning at **council level**	☐	☐	☐	☐	☐	☐	☐

2. I think it would be useful for children to learn about (please tick all that apply):

- ☐ Disaster prevention and preparedness
- ☐ Problem-solving/decision-making tools related to life problems
- ☐ How to be involved in the community to help prepare and to response when disasters strikes
- ☐ Climate change
- ☐ The environment and sustainability
- ☐ None of the above
- ☐ Other

If other, please describe here:_____

_____

3. I think the following institutions should be involved for children's education on disaster risk reduction (please tick all that apply):

- ☐ Their local school
- ☐ District disaster management agency
- ☐ District health office
- ☐ Local council
- ☐ Other

If other, please describe here:_____

_____

4. My school has included the following subject(s) in the curriculum: (please tick all that apply):

- ☐ Disaster prevention and preparedness
- ☐ Problem-solving/decision-making tools related to life problems
- ☐ How to be involved in the community to help prepare and to response when disasters strikes
- ☐ Climate change
- ☐ Environment and sustainability
- ☐ Other

If other, please describe here:_____

_____

5. My school has conducted the following activities (please tick all that apply):

- ☐ Table-top exercises
- ☐ Emergency response exercises and training
- ☐ Full disaster simulations

6. If you ticked any of the activities in question 5, do you think they were useful to improve preparedness? ☐ Yes ☐ No

7. If you **DID NOT** tick any of the activities in question 5, do you think any of them would be useful to improve preparedness? ☐ Yes ☐ No

8. How would you rate your school's coordination with the disaster management agency and local council, in relation to emergency management planning and preparedness?

☐	☐	☐	☐	☐	☐	☐
No coordination	Very low	Low	Medium	High	Very High	I don't know

9. Do you expect to have changes to your school's level of contact with other agencies in relation to emergency planning and preparedness?

☐ Yes ☐ No

If yes, please describe the changes that you expect to occur:

_____

_____

10. What would be the barriers or challenges that might deter you from doing disaster risk reduction education for children in your classroom? (please tick all that apply)

- ☐ **Lack of "ready to go" and "child-friendly" teaching resources**
- ☐ **Lack of knowledge about disaster risk reduction**
- ☐ **Lack of training in developing and/ or delivering programs of this sort**
- ☐ **The topic is not relevant for the students**
- ☐ **The topic is not a priority by the school management**
- ☐ Not compatible with my beliefs about what children should learn in school
- ☐ Not enough space in the curriculum
- ☐ Lack of interest from the community
- ☐ Not enough budget, and personnel
- ☐ Weak coordination between schools, disaster management agency, and local councils
- ☐ **No clear mandate and/ or policies to implement disaster risk reduction education for children**
- ☐ Other

If other, please describe here:_____

_____

11. What factors might help you to do disaster risk reduction education for children in your classroom? (please tick all that apply)

- ☐ Availability of useful "ready to go" and "child friendly" teaching resources
- ☐ Promotion on the teaching resources by other teachers or education personnel
- ☐ Training available on how to develop and/or deliver such programs for children
- ☐ Innovative methods for curriculum inclusion (e.g., combining learning with school drills)
- ☐ **The topic becomes a priority by the school management**
- ☐ Topic is timely in relation to upcoming risk for local natural hazards (e.g., bushfire/fire/cyclone/flooding seasons)
- ☐ Personal interest in the topic
- ☐ Student interest in the topic
- ☐ Clear policies for school to deliver disaster risk reduction education for children
- ☐ Dedicated time, personnel, and budget made available
- ☐ Good partnerships between schools, disaster management agency, and local councils
- ☐ High demand from the local community/ students on disaster risk reduction education for children
- ☐ Other

If other, please describe here:_____

12. Would you be interested in training if it was offered and didn't impinge unduly on your time?

☐ Yes ☐ No

13. If yes, what type of training would you be interested in? (Please tick all that apply)

☐ Classroom or Instructor-Led training

☐ Experiential or Hands-on training

☐ Computer-Based training

☐ Online or E-learning

☐ Blended or combination of the above

☐ Others

If you select "blended or combination of the above" or "other", please explain briefly here:

_____

_____

14. Please indicate how prepared your school currently is to respond to a hazard

☐	☐	☐	☐	☐	☐	☐
1 - Not at all	2	3	4 - Moderately	5	6	7 - Very well

15. Below are the steps of contingency planning process. Please tick one option only under each of the 7 steps.

Step 1: Conducting risk assessment and analysis

☐ I think children should be involved in this process

☐ I think children should only be informed on the results of this process

☐ I don't think children should be involved nor informed in this process

☐ I am not sure

☐ I have other views: (please describe)

Step 2: Developing disaster scenarios

- ☐ I think children should be involved in this process
- ☐ I think children should only be informed on the results of this process
- ☐ I don't think children should be involved nor informed in this process
- ☐ I am not sure
- ☐ I have other views: (please describe)

Step 3: Analysis on the severity of disaster impacts

- ☐ I think children should be involved in this process
- ☐ I think children should only be informed on the results of this process
- ☐ I don't think children should be involved nor informed in this process
- ☐ I am not sure
- ☐ I have other views: (please describe)

Step 4: Identify policies and strategies during emergencies

- ☐ I think children should be involved in this process
- ☐ I think children should only be informed on the results of this process
- ☐ I don't think children should be involved nor informed in this process
- ☐ I am not sure
- ☐ I have other views: (please describe)

Step 5: Assessing projections of needs and the available resources (when disaster occurs)

- ☐ I think children should be involved in this process
- ☐ I think children should only be informed on the results of this process
- ☐ I don't think children should be involved nor informed in this process
- ☐ I am not sure
- ☐ I have other views: (please describe)

Step 6: Identifying a plan of action for building preparedness

- ☐ I think children should be involved in this process
- ☐ I think children should only be informed on the results of this process
- ☐ I don't think children should be involved nor informed in this process
- ☐ I am not sure
- ☐ I have other views: (please describe)

Step 7: Testing the contingency plan through disaster simulation

- ☐ I think children should be involved in this process
- ☐ I think children should only be informed on the results of this process
- ☐ I don't think children should be involved nor informed in this process
- ☐ I am not sure
- ☐ I have other views: (please describe)

Appendix B

Guiding questions for FGD with child-focus NGOs

Session 1: Exploring understanding and experiences on CCDRR

1) What do you think the results in using child-centred approach in emergency management planning? Does it work?
2) Can it be sustained when you phased out from the community?
3) What would be required for the program to sustain when you phased out?
4) What preparations have you done to ensure that the program will be sustained?
5) What would be the barriers and challenges?
6) What would your expectation for the future of CCDRR programming?
7) What is your strategy to scale-up?

Session 2: Focusing on emergency management planning.

8) What would be the role of children in the process?
    a. Should they have responsibility to do certain actions? Or
    b. Should they limited to be consulted in certain stages? Or
    c. Should they only be informed of the process and the results?
    d. Or perhaps you have other views?

Remarks:

- Government-standard emergency management planning process will be used
- Participants will be around 6-8 people aiming from at least 5 agencies
- Each agency may have their own interpretation of child-centeredness approach, therefore it would be useful to capture the discussions
- The process will be video recorded
- We are not using the Hart's ladder to measure the level of participation of children as it is assumed that these child-focused NGOs will advocate for the highest level of participation of children. However, it would be useful to know from their perspectives, when (or at what stage) do the children should take Responsibility, or be Consulted, or just being Informed (using the RACI matrix[16]).
- Duration of FGD could be up to half working day (3-4 hours)
- Venue can use the UN meeting room (free of charge), lunch and snacks needs to be provided
- Why only international agencies? Usually (though not all) community based DRR programming implemented by local NGOs are being financed by these international NGOs and the ways of working usually influenced by these international agencies

[16] This is usually used as project management tool. RACI (less than 6 minutes): https://www.youtube.com/watch?v=1U2gngDxFkc

Appendix C

Children questionnaire

Questionnaire on Disaster Preparedness

For 4th and 5th Grade Students

Full Name: Gender (Male/ Female):

Age: School Name:

Question related to your perspectives on hazards and disasters

1. Which of the following hazards could affect you at school? **(please tick all that apply)**

☐ Earthquake ☐ Tsunami ☐ Landslides

☐ Volcano eruption ☐ Floods ☐ Strong winds/ typhoon

☐ Droughts ☐ Forest/ bush fire ☐ Urban fire

☐ Tidal wave ☐ Diseases/ Epidemics ☐ Riot, conflict or violence

☐ Others. If you choose this, please describe below:

2. Which of the following hazards could affect you at home? **(please tick all that apply)**

☐ Earthquake ☐ Tsunami ☐ Landslides

☐ Volcano eruption ☐ Floods ☐ Strong winds/ typhoon

☐ Droughts ☐ Forest/ bush fire ☐ Urban fire

☐ Tidal wave ☐ Diseases/ Epidemics ☐ Riot, conflict or violence

☐ Others. If you choose this, please describe below:

3. Do you know how to be safe from disasters?

☐ Yes ☐ No ☐ I am not sure

4. If yes, where have you learned it from? **(please tick all that apply)**

☐ Father ☐ Mother ☐ Grandparents

☐ Brothers or sisters ☐ Friends ☐ Other relatives

☐ Extra curricula (e.g. scouts) ☐ Teachers ☐ School books

☐ Newspaper, magazines, or others ☐ TV, radio, or others ☐ Internet

☐ Others. If you choose this, please describe below:

5. With whom do you share and discuss your daily activities? **(please tick all that apply)**

☐ Father ☐ Mother ☐ Grandparents

☐ Brothers or sisters ☐ Friends at school ☐ Other relatives

☐ Friends at neighbourhood

☐ Others. If you choose this, please describe below:

6. Would you like to know more about how to stay safe from disasters?

☐ Yes ☐ No ☐ I am not sure

Why? Please briefly explain your answer

7. Do you feel worried, scared, or upset when you think or talk about disasters, such as floods or fire?

☐	☐	☐	☐	☐
Not at all	Yes, sometimes	Yes, often	Yes, always	I am not sure

8. I can make myself comfortable or calm in an emergency

☐	☐	☐	☐
Yes, I can	Maybe	No, I can not	I am not sure

9. I can help other children to feel comfortable or less upset in an emergency

☐	☐	☐	☐
Yes, I can	Maybe	No, I can not	I am not sure

10. Have you ever done drills at home?

☐	☐	☐
Yes	No	I am not sure

11. Have you ever done drills at your school?

☐ ☐ ☐

Yes No I am not sure

12. Does your house have preparedness plans (a document explaining what to do before and during disasters)?

☐ ☐ ☐

Yes No I am not sure

13. If not, do you want to have it in your house?

☐ ☐ ☐

Yes No I am not sure

14. Do you think you should be involved in developing the plan?

☐ ☐ ☐

Yes No I am not sure

15. Do you want your school to have disaster preparedness plans?

☐ ☐ ☐

Yes No I am not sure

16. Do you think you should be involved in developing the plan?

☐ ☐ ☐

Yes No I am not sure

17. What do you think on **your school** readiness to face disaster risks?

☐ ☐ ☐ ☐ ☐

Very not prepared Not prepared Prepared Very prepared I am not sure

18. What do you think on **your home** readiness to face disaster risks?

☐	☐	☐	☐	☐
Very not prepared	Not prepared	Prepared	Very prepared	I am not sure

19. Would you like to be involved in making your school to be more prepared for disasters? ☐ Yes ☐ No ☐ I am not sure

20. Would you like to be involved in making your home to be more prepared for disasters? ☐ Yes ☐ No ☐ I am not sure

Why? Please briefly explain your answer

Questions related to knowledge and skills on fire preparedness

21. List five (5) things that you need to do to prevent fire in our home?

22. If we hear danger signs (wailing siren, bamboo knocking, electric pole knocking, alarm bells, etc) what should you do?
    a. Ignore it and keep playing
    b. Run toward the sounds
    c. Stop, listen and do what you told
    d. I don't know

23. If you are sitting in a class at school when a fire breaks out, which one of these is the correct procedure
    a. Everyone shout "Fire!" and run out
    b. Follow teachers' instructions. Don't talk. Don't run. Don't push. Don't go back
    c. Pick up all my belongings and look for a telephone
    d. I don't know
24. How do you put out fire from a burning stove?
    a. Throw cold water
    b. Throw warm water
    c. Cover it with a damp towel or blanket
    d. I don't know
25. If you are at home and there is a fire approaching, what should you do?
    a. Stay inside
    b. Go outside away from the fire
    c. Go outside to get a better view
    d. I don't know

Questions related to flood and tidal wave preparedness

26. List five (5) things that we should do during floods or tidal wave in our home or surrounding environments:

27. What should you be aware of when flood water has receded?
    a. People, pets, and bugs
    b. Nothing to worry about
    c. Stay away from electric poles, fallen trees, and wild animals such as snakes
    d. I don't know
28. If you are at home and flooding starts, what should you do?
    a. Go outside and play with water
    b. Turn off electronics and put things up high
    c. Watch TV or listen to the radio
    d. I don't know
29. What should you do when you hear or see signs of flooding?
    a. Go to a higher and safer place
    b. Go outside and play with water
    c. Nothing
    d. I don't know

30. If you must enter flood waters, what should you wear on your feet?
    a. Boots or waterproof shoes
    b. Slippers
    c. Bare feet
    d. I don't know
31. If you must enter flood waters, what should you check?
    a. Temperature
    b. Depth
    c. Bugs
    d. I don't know
32. What should you use to check the flood waters?
    a. Stick
    b. Legs
    c. Eyes
    d. I don't know
33. If you must enter flood waters, what should you look out for?
    a. Boats
    b. Bugs
    c. Snakes or other wild animals
    d. I don't know
34. Should you go into water that is more than knee-deep?
    a. Yes, because I can swim
    b. No, because I cannot swim
    c. No, because it is dangerous
    d. I don't know
35. When you return to your house after flood waters recede, what do you do?
    a. Leave it
    b. Clean it as much as we can. Use protective clothing and be very careful
    c. Play inside
    d. I don't know

Questions related to hygiene practices

36. Do you think it is safe to eat food that has been in contact with flood water?
    a. No, if it looks dirty
    b. No, throw it out
    c. Yes, if it looks okay
    d. I don't know
37. How do we make sure that the water we drink is safe after flooding?
    a. Drink boiled water or bottled water only
    b. Drink the water if it looks clean
    c. We should not drink for a while
    d. I don't know

38. To kill germs, we should wash our hands using:
    a. Water
    b. Running water and soap
    c. Water, soap, and tissue
    d. I don't know
39. When do you wash your hands with soap?
    a. Before eating
    b. Before and after eating
    c. Before and after eating and also before and after peeing and defecate (poop)
    d. I don't know
40. If your house is flooded and you want to poop, what should you do?
    a. Poop anywhere since it is an emergency
    b. Poop at your neighbor house, shelter or other latrine that is not flooded
    c. We should wait to poop until the flood water going down
    d. I don't know

** FINISHED ** ☺

Thank you very much for your thoughts and taking the time to complete this survey

Appendix D

Documentation for human ethics requirement

Approval Letter

MACQUARIE UNIVERSITY
FACULTY OF SCIENCE

Dear Dr Haynes

RE: Ethics project entitled: " Connecting communities: Integration of disaster preparedness measures at household, school, and community level, using a child-centered approach"

Ref number: 5201400846

The Faculty of Science Human Research Ethics Sub-Committee has reviewed your application and granted final approval, effective 21st October 2014. You may now commence your research.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Dr Katharine Haynes
Mr Avianto Amri
Professor Kevin Ronan

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 21st October 2015
Progress Report 2 Due: 21st October 2016
Progress Report 3 Due: 21st October 2017
Progress Report 4 Due: 21st October 2018
Final Report Due: 21st October 2019

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:
http://www.mq.edu.au/policy/

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of Final Approval to an external organisation as evidence that you have Final Approval, please do not hesitate to contact the Ethics Secretariat at the address below.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely,
Richie Howitt, Chair
Faculty of Science Human Research Ethics Sub-Committee
Macquarie University
NSW 2109

Information and Consent Form for Parents/ Caregivers

Department of Environment and Geography
Faculty of Science
MACQUARIE UNIVERSITY NSW 2109

Contact: Avianto Amri

Phone: +61 (0)2 9850 9683
Fax: +61 (0)2 9850 9394
Mobile (Australia): +61 (0)416 515 720
Mobile (Indonesia): +62 (0)855 210 6610
Email: Avianto.amri@students.mq.edu.au

Supervisors:

Dr Katharine Haynes

Professor Kevin Ronan

Information and Consent Form

Re: Your child's participation in the project:
Connecting communities: Integration of disaster preparedness measures at household, school, and community level, using a child-centred approach

Your child is invited to participate in a study looking into policies and practices of disaster preparedness measures at the household, school, and community level in Jakarta. The purpose of the study is to improve measures of preparedness in a holistic and integrated way that aim to build resilient communities, with a child-centred approach as one of the centrepieces of those efforts.

Your child has been selected because the school your child attends is located in a flood and/or fire prone area and your child has been participating in school based disaster risk reduction programming.

By sharing their experiences and views, both in general and in relation to the development of contingency plans in the school area, your child will be making an important contribution that may facilitate the enhancement of community resilience. The case study areas for this study are: 1) Palmerah, 2) Tambora, 3) Kembangan, and 4) Taman Sari sub-districts. All sub-districts are in West Jakarta administrative area in Jakarta province, Indonesia.

The study will be conducted by **Mr. Avianto Amri** (email: Avianto.amri@students.mq.edu.au), to fulfil the requirements of a Master of Research degree at Macquarie University, Australia under the supervision of Dr Katharine Haynes (as the Principal Investigator, email: katharine.haynes@mq.edu.au) and Professor Kevin Ronan (as the Associate Supervisor, email: k.ronan@cqu.edu.au). The research is funded by the Department of Environment and Geography, Macquarie University and the Australian Bushfire and Natural Hazards Collective Research Centre (BNHCRC).

If your child would like to volunteer for the study and you consent to his/ her participation, your child will be involved in a focus group discussion with his/ her peers facilitated by Mr. Avianto Amri. The focus groups will be scheduled in consultation with the teachers at your child's school to ensure that it takes place at the most convenient and least disruptive time. The discussion is estimated to take approximately two hours, which can be adjusted to meet your child's needs.

The Education Office from Jakarta Province and your child's school have agreed to participate in this study. However, your child is under no obligation to participate.

The discussion will be video-recorded digitally to maintain the accuracy of the information provided, and this recording will only be available to the researchers listed above. By providing consent to participate in the study you will also be providing permission for your child to be video-recorded during the focus group discussion.

Your child's participation in the study is voluntary. Your child is not obliged to participate and if you and your child do provide consent, your child is free to withdraw at any time without having to give a reason and without consequences.

The results of the research will be used to produce a Masters level research thesis, a publication in a peer-reviewed journal and a report for the BNHCRC. The non-identifiable information will also be used for future related research as required.

Please note that no report or document produced from this study will contain any single person's identifying information. Unless you state otherwise, no individual will be identified in any publication of results and your child's responses will remain anonymous. On request, you will be offered a copy of any resulting publications either electronically or by mail upon completion of this research.

I, *(parent's name)* have read *(or, where appropriate, have had read to me)* and understand the information above and any questions I have asked have been answered to my satisfaction. I agree for my child to participate in this research, knowing that I can withdraw his/her particpation in the research at any time without consequence. I have been given a copy of this form to keep.

Child's Name:_____
(Block letters)

Parent's Name:_____
(Block letters)

Parent's Signature:_____ Date:_____

Investigator's Name:_____
(Block letters)

Investigator's Signature:_____ ___ Date:_____

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone +61 (0) 2 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)

Information and Consent Form for Parents/ Caregivers (Bahasa)

Department of Environment and Geography
Faculty of Science
MACQUARIE UNIVERSITY NSW 2109

Detail Kontak: Avianto Amri
Telepon: +61 (0)2 9850 9683
Fax: +61 (0)2 9850 9394
Handphone (Australia): +61 (0)416 515 720
Handphone (Indonesia): +62 (0)855 210 6610
Email: Avianto.amri@students.mq.edu.au

Pembimbing:
Dr Katharine Haynes
Professor Kevin Ronan

Lembar informasi dan persetujuan

Perihal: Partisipasi anak Anda dalam riset:
Satu komunitas: Integrasi kegiatan kesiapsiagaan bencana di tingkat rumah, sekolah, dan kelurahan menggunakan pendekatan yang berpusat pada anak

Anak Anda diundang untuk berpartisipasi dalam suatu kajian mengenai kebijakan dan pelaksanaan kegiatan kesiapsiagaan bencana di tingkat rumah, sekolah, dan kelurahan di Jakarta. Tujuan dari kajian ini adalah untuk memperkuat tingkat kesiapsiagaan bencana secara holistic dan terintegrasi dengan tujuan untuk menciptakan masyarakat yang tangguh, dengan menggunakan pendekatan yang berpusat pada anak yang menjadi inti dari kegiatan-kegiatan yang dilakukan.

Anak Anda dipilih karena sekolah anak Anda berada di lokasi rawan banjir dan anak Anda telah terlibat di dalam kegiatan pengurangan risiko bencana di sekolahnya.

Dengan menceritakan pengalaman dan pendapat anak Anda, secara umum dan juga mengenai kegiatan kesiapsiagaan bencana yang telah anak Anda lakukan, anak Anda akan berkontribusi pada peningkatan kesiapsiagaan di daerah Anda tinggal/ bekerja.

Adapun wilayah studi ini adalah: 1) Palmerah, 2) Tambora, 3) Kembangan, and 4) Taman Sari sub-districts. Seluruh wilayah terletak di Jakarta Barat, DKI Jakarta, Indonesia.

Studi ini akan dilaksanakan oleh **Avianto Amri** (email: Avianto.amri@students.mq.edu.au), sebagai prasyarat untuk titel Master of Research di Macquarie University, Australia dibawah bimbingan Dr Katharine Haynes (sebagai Pembimbing Utama, email: katharine.haynes@mq.edu.au) dan Professor Kevin Ronan (sebagai Pembimbing Pendamping, email: k.ronan@cqu.edu.au). Studi ini didanai oleh Department of Environment and Geography, Macquarie University dan the Bushfire and Natural Hazards Collective Research Centre (BNHCRC).

JIka anak Anda bersedia untuk ikut serta, anak Anda akan terlibat dalam diskusi kelompok yang difasilitasi oleh Avianto Amri. Diskusi kelompok ini akan dilaksanakan dengan konsultasi dahulu bersama pihak sekolah agar tidak mengganggu proses belajar mengajar.

Riset ini sudah mendapatkan ijin dari Dinas Pendidikan Provinsi Jakarta dan pihak sekolah sudah pula memberikan ijin untuk melakukan riset ini. Namun, partisipasi anak Anda adalah tidak wajib.

Diskusi kelompok ini akan direkam melalui video kamera agar memudahkan pencatatan segala informasi yang muncul disaat diskusi. Adapun rekaman ini hanya dapat diakses oleh orang-orang yang disebut diatas. Dengan memberikan ijin agar anak Anda terlibat dalam studi ini, maka Anda pula memberikan ijin untuk kami merekam proses diskusi menggunakan video kamera.

Karena ini bersifat sukarela, anak Anda tidak diwajibkan untuk ikut serta dan apabila anak Anda ikut serta, anak Anda dapat bebas untuk mengakhiri partisipasi kapan pun tanpa perlu memberikan penjelasan dan tanpa konsekuensi apapun.

Hasil dari survey ini akan digunakan untuk menyusun tesis yang akan dipublikasi di jurnal yang dikaji oleh kolega lainnya dan juga menjadi laporan untuk BNHCRC. Informasi yang didapat juga akan digunakan untuk kepentingan riset dikemudian hari apabila dibutuhkan.

Laporan atau dokumen yang dihasilkan dari studi ini tidak akan mencantumkan nama responden secara spesifik. Kecuali atas keinginan Anda, nama anak Anda tidak akan dikaitkan dalam hasil spesifik daam studi ini dan masukan anak Anda akan tetap tanpa nama. Hasil dari studi ini dapat Anda dapatkan secara elektronik atau dalam bentuk cetak, apabila Anda menginginkannya.

Saya, *(nama peserta)* telah membaca (atau telah dibacakan kepada saya) dan mengerti mengenai informasi diatas dan semua pertanyaan yang saya tanyakan telah dijawab sesuai dengan harapan saya. Saya setuju untuk anak saya ikut serta dalam studi ini, dan memahami bahwa saya bisa mengakhiri keikutsertaan anak saya kapanpun tanpa konsekuensi apapun. Saya mendapatkan salinan formulir ini untuk dokumentasi saya.

Nama Lengkap anak:_____
(Huruf kapital)

Nama Lengkap orang tua:_____
(Huruf kapital)

Tanda tangan orang tua: _____ Tanggal:_____

Nama Pewawancara:_____
(Huruf kapital)

Tanda tangan Pewawancara:_____ ___ Tanggal:_____

Komponen etik dari studi ini sudah disetujui oleh Macquarie University Human Research Ethics Committee. Apabila Anda memiliki keluhan atau keberatan mengenai keikutsertaan Anda dalam studi ini, Anda dapat menghubungi Ethics Committee ditujukan kepada Director, Research Ethics (Telepon +61 (0) 2 9850 7854; email ethics@mq.edu.au). Segala keluhan yang Anda ajukan akan diperlakukan secara rahasia dan ditelusuri, dan Anda akan diinformasikan mengenai hasil penelusuran kami.

(SALINAN UNTUK PEWAWANCARA/ RESPONDEN)

Information and Consent Form for School Personnel

Department of Environment and Geography
Faculty of Science
MACQUARIE UNIVERSITY NSW 2109

Contact: Avianto Amri
Phone: +61 (0)2 9850 9683
Fax: +61 (0)2 9850 9394
Mobile (Australia): +61 (0)416 515 720
Mobile (Indonesia): +62 (0)855 210 6610
Email: Avianto.amri@students.mq.edu.au

Supervisors:
Dr Katharine Haynes
Professor Kevin Ronan

Information and Consent Form

Re: Your participation in the project:
Connecting communities: Integration of disaster preparedness measures at household, school, and community level, using a child-centred approach

You are invited to participate in a study looking into policies and practices of disaster preparedness measures at the household, school, and community level in Jakarta. The purpose of the study is to improve measures of preparedness in a holistic and integrated way that aim to build resilient communities, with a child-centred approach as one of the centrepieces of those efforts. By telling us about your knowledge and experiences, both in general and in relation to the development of contingency plans in your area, you will be making an important contribution that may facilitate the enhancement of community resilience. The case study areas for this study are: 1) Palmerah, 2) Tambora, 3) Kembangan, and 4) Taman Sari sub-districts. All sub-districts are in West Jakarta administrative area in Jakarta province, Indonesia.

The study will be conducted by **Mr. Avianto Amri** (email: Avianto.amri@students.mq.edu.au), to fulfil the requirements of a Master of Research degree at Macquarie University, Australia under the supervision of Dr Katharine Haynes (as the Principal Investigator, email: katharine.haynes@mq.edu.au) and Professor Kevin Ronan (as the Associate Supervisor, email: k.ronan@cqu.edu.au). The research is funded by the Department of Environment and Geography, Macquarie University and the Bushfire and Natural Hazards Collective Research Centre (BNHCRC).

If you decide to participate, you will be asked to complete an interview with Mr. Avianto Amri. The interview will be either semi-structured or in the form of a questionnaire. The interview will be held at a time and place convenient to you and arranged in advance. Your participation is completely voluntary with an estimated duration of approximately one hour, which can be adjusted to meet your convenience. The discussion will be audio-recorded digitally to maintain the accuracy of the provided information, and this recording will only be available to the researchers listed above.

Since this is voluntary, you are not obliged to participate and if you do decide to participate, you are free to withdraw at any time without having to give a reason and without consequences.

The results of the survey will be used to produce a thesis publication in a peer-reviewed journal and reports for the BNHCRC. The non-identifiable information will also be used for future related research as required.

Please note that no report or document produced from this study will contain any single person's identifying information. Unless you state otherwise, no individual will be identified in any publication of results and your responses will remain anonymous. On request, you will be offered a copy of any resulting publications either electronically or by mail upon completion of this research.

I, *(participant's name)* have read *(or, where appropriate, have had read to me)* and understand the information above and any questions I have asked have been answered to my satisfaction. I agree to participate in this research, knowing that I can withdraw from further participation in the research at any time without consequence. I have been given a copy of this form to keep.

Participant's Name:_____
(Block letters)

Participant's Signature:_____ Date:_____

Investigator's Name:_____
(Block letters)

Investigator's Signature:_____ ___ Date:_____

The ethical aspects of this study have been approved by the Macquarie University Human Research Ethics Committee. If you have any complaints or reservations about any ethical aspect of your participation in this research, you may contact the Committee through the Director, Research Ethics (telephone +61 (0) 2 9850 7854; email ethics@mq.edu.au). Any complaint you make will be treated in confidence and investigated, and you will be informed of the outcome.

(INVESTIGATOR'S [OR PARTICIPANT'S] COPY)

Information and Consent Form for School Personnel (Bahasa)

Department of Environment and Geography
Faculty of Science
MACQUARIE UNIVERSITY NSW 2109

Detail Kontak: Avianto Amri
Telepon: +61 (0)2 9850 9683
Fax: +61 (0)2 9850 9394
Handphone (Australia): +61 (0)416 515 720
Handphone (Indonesia): +62 (0)855 210 6610
Email: Avianto.amri@students.mq.edu.au

Pembimbing:
Dr Katharine Haynes
Professor Kevin Ronan

Lembar informasi dan persetujuan

Perihal: Partisipasi anda dalam riset
Satu komunitas: Integrasi kegiatan kesiapsiagaan bencana di tingkat rumah, sekolah, dan kelurahan menggunakan pendekatan yang berpusat pada anak

Anda diundang untuk berpartisipasi dalam suatu kajian mengenai kebijakan dan pelaksanaan kegiatan kesiapsiagaan bencana di tingkat rumah, sekolah, dan kelurahan di Jakarta. Tujuan dari kajian ini adalah untuk memperkuat tingkat kesiapsiagaan bencana secara holistic dan terintegrasi dengan tujuan untuk menciptakan masyarakat yang tangguh, dengan menggunakan pendekatan yang berpusat pada anak yang menjadi inti dari kegiatan-kegiatan yang dilakukan.

Dengan menceritakan pengalaman dan pemahaman Anda, secara umum dan juga mengenai kegiatan kesiapsiagaan bencana yang telah Anda lakukan, Anda akan berkontribusi pada peningkatan kesiapsiagaan di daerah Anda tinggal/ bekerja.

Adapun wilayah studi ini adalah: 1) Palmerah, 2) Tambora, 3) Kembangan, and 4) Taman Sari sub-districts. Seluruh wilayah terletak di Jakarta Barat, DKI Jakarta, Indonesia.

Studi ini akan dilaksanakan oleh **Avianto Amri** (email: Avianto.amri@students.mq.edu.au), sebagai prasyarat untuk titel Master of Research di Macquarie University, Australia dibawah bimbingan Dr Katharine Haynes (sebagai Pembimbing Utama, email: katharine.haynes@mq.edu.au) dan Professor Kevin Ronan (sebagai Pembimbing Pendamping, email: k.ronan@cqu.edu.au). Studi ini didanai oleh Department of Environment and Geography, Macquarie University dan the Bushfire and Natural Hazards Collective Research Centre (BNHCRC).

JIka Anda bersedia untuk ikut serta, Anda akan diwawancara oleh Avianto Amri. Wawancara ini akan dilakukan dengan semi-terstruktur atau menggunakan kuesioner. Wawancara ini akan dilakukan pada saat dan di tempat yang Anda setujui. Partisipasi Anda adalah secara sukarela dengan perkiraan waktu yang dibutuhkan sekitar satu jam, yang dapat diseusaikan dengan waktu Anda. Diskusi Anda akan direkam agar apa yang Anda jelaskan tidak akan terlewat, dan rekaman ini hanya dapat diakses oleh pewawancara dan pembimbing yang dijelaskan sebelumnya.

Karena ini bersifat sukarela, Anda tidak diwajibkan untuk ikut serta dan apabila Anda ikut serta, Anda dapat bebas untuk mengakhiri partisipasi Anda kapan pun tanpa perlu memberikan penjelasan dan tanpa konsekuensi apapun.

Hasil dari survey ini akan digunakan untuk menyusun tesis yang akan dipublikasi di jurnal yang dikaji oleh kolega lainnya dan juga menjadi laporan untuk BNHCRC. Informasi yang didapat juga akan digunakan untuk kepentingan riset dikemudian hari apabila dibutuhkan.

Laporan atau dokumen yang dihasilkan dari studi ini tidak akan mencantumkan nama responden secara spesifik. Kecuali atas keinginan Anda, nama Anda tidak akan dikaitkan dalam hasil spesifik daam studi ini

dan masukan Anda akan tetap tanpa nama. Hasil dari studi ini dapat Anda dapatkan secara elektronik atau dalam bentuk cetak, apabila Anda menginginkannya.

Saya, *(nama peserta)* telah membaca (atau telah dibacakan kepada saya) dan mengerti mengenai informasi diatas dan semua pertanyaan yang saya tanyakan telah dijawab sesuai dengan harapan saya. Saya setuju untuk ikut serta dalam studi ini, dan memahami bahwa saya bisa mengakhiri keikutsertaan saya kapanpun tanpa konsekuensi apapun. Saya mendapatkan salinan formulir ini untuk dokumentasi saya.

Nama Lengkap responden:_____
(Huruf kapital)

Tanda tangan responden: _____ Tanggal:_____

Nama Pewawancara:_____
(Huruf kapital)

Tanda tangan Pewawancara:_____ ___ Tanggal:_____

Komponen etik dari studi ini sudah disetujui oleh Macquarie University Human Research Ethics Committee. Apabila Anda memiliki keluhan atau keberatan mengenai keikutsertaan Anda dalam studi ini, Anda dapat menghubungi Ethics Committee ditujukan kepada Director, Research Ethics (Telepon +61 (0) 2 9850 7854; email ethics@mq.edu.au). Segala keluhan yang Anda ajukan akan diperlakukan secara rahasia dan ditelusuri, dan Anda akan diinformasikan mengenai hasil penelusuran kami.

(SALINAN UNTUK PEWAWANCARA/ RESPONDEN)