

Child centred disaster risk reduction and climate change adaptation: Roles of Gender and Culture in Indonesia

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Summary

The principle aim of this research was to investigate the roles of gender and religion in child-centred disaster risk reduction (DRR). Moreover, and through participatory research, informal conversations and direct advocacy, the project team hoped to build knowledge and awareness of child-centred DRR. The research was also designed to validate findings from previous research by the wider project team and to provide a body of empirical evidence in support of child-centred DRR and the Children in a Changing Climate programme.

Key words

Child-centred disaster risk reduction, climate change adaptation (CCA), disaster risk reduction (DRR), gender and risk communication.

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Contents

Acknowledgments, Summary, Key words

About the authors

1.	Introduction	6
2.	Disaster risk context in Indonesia and field-work locations	7
3	Research design and methods	12
4	Conceptual framework	15
4.1	Child development theories.	15
4.2	Children and social cultural context	18
4.3	Children's geographies	19
4.4	Religion and risk consciousness	20
4.5	Children as risk communicators: policy context	21
5.	Research findings	23
6.	Discussion and conclusions	38
7.	Further research	41

Bibliography	42
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Tables

Table 1.	Estimate of Indonesian national losses in ten selected disasters 2004-08	8
Table 2.	School building damages in selected recent disaster events.	9
Table 3.	Research locations	9
Table 4.	Basic demographic data for Sikka and Rembang	11
Table 5.	Child and adult participants by age and gender	15
Table 6.	Selected methods utilised for different research participants	14
Table 7a	Mesabewa village: children's views of what boys and girls can do to reduce disasters	24
Table 7b	Mesabewa village: adults' views of what boys and girls can do to reduce disasters	25
Table 8	If I were an adult, what would I do to reduce disaster risks	26
Table 9a	Risk ranking for the children of Pakis village	26
Table 9b	Example of risk priorities by different actors (Pakis village)	27
Table 10	Boys group: causes and solutions, Dowan village	28
Table 11	Girls' group: causes and solutions, Dowan village	29
Table 12	Children's views of the comparative roles of boys and girls (Wolodhesa village).	30

Table 13	Risk ranking by adults, Pakis village	31
----------	---------------------------------------	----

Table 14	Age range of participants	32
----------	---------------------------	----

Table 15	Types of risk identified by girls and boys (Pakis village)	33
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Boxes

Box 1.	Section of an interview with a family in their home in Dowan village, Rembang	31
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1.0 Introduction

Disaster Risk Reduction (DRR) is an approach that seeks to address the underlying causes of disasters. It is now widely recognised that vulnerability to environmental hazards and disasters is shaped by a broad spectrum of political, economic and social factors such as poverty, poor governance and a lack of appropriate land use planning (Wisner *et al* 2004; Pelling 2003). A shift from engineering and technical fixes to one embedded within development has enabled community participation in DRR. The involvement of the community not only creates a sense of ownership, but also ensures that programmes and policy can be better focused to individual needs. Unfortunately, what is termed as community based is often found to be focused on adults, especially men. This is despite the fact that in many developing countries, children form the bulk of the population and along with women and the elderly are frequently the most vulnerable to natural disasters (Enarson 2009; Peek 2009; Enarson and Morrow 1998; Lauten and Lietz 2008; Babugura 2008; Neumayer and Plumper 2007; Wisner 2006). This trend is clearly exemplified by the unequal toll of males to females in recent disasters (Cutter 1995; Fordham 1999; Fothergill 1996). This was particularly the case in the 2004 Indian Ocean tsunami where the largest numbers of fatalities were women and children, especially those in early adolescence (Rofi and Doocy 2006; Doocy *et al* 2007; Feltenbierrmann 2006; Nishikiori *et al* 2006; The Synthesis Report of the Tsunami Evaluation Coalition 2006). Between 1991 and 2000, the lives of an estimated 77 million children were affected by disasters and conflict (Plan UK 2002). It is acknowledged that children may not always be the most vulnerable group and, in some contexts, such as the United States, the implementation of various social policy systems will mean that children may be highly protected (Bourque *et al* 2007).

Although much work needs to be done to address the inequalities that often cause women to be more vulnerable, the issue of gender and the unique capacities of women is now a central issue in development and disaster research (Enarson and Morrow 1998, Fothergill 1996; Fordham 1998, 2004). In comparison, while the vulnerabilities of children and youth have been highlighted (see Anderson 2000, 2005; Neumayer and Plumper 2007; Peek, 2008) their capacity to recognise and communicate risk issues and take direct actions to reduce risks has largely been ignored (Ansell 2005; Scraton 1997; Mitchell *et al* 2009).

Consequently, the potential role and opportunities for children and youth in development-oriented approaches to DRR is still largely unknown. Similar gaps in regards to climate change adaptation (CCA) also need to be addressed (Tanner 2010), as children's needs and roles in the CCA process lack visibility within emerging national and international policy frameworks and debates on climate change (Goodman and Iltus 2008).

This research examined the benefits and feasibility of child-centred DRR in Indonesia, with a focus on the potential impact of gender and religion. This paper follows findings of Mitchell *et al* (2009) to which readers are directed for more detailed background as well as to the wider literature on child-centred DRR and child participation. Readers are also directed to Tanner (2010) for further detail on child-centred climate change adaptation. The paper begins with an introduction to the disaster context within Indonesia and a brief background to the fieldwork locations. This is followed by a brief literature review that outlines relevant issues surrounding child development questions absent from Mitchell *et al* (2009). In what follows, we outline the methodology employed in this research followed by the salient results and discussion of these.

2.0 Disaster risk context in Indonesia and field-work locations

Indonesia is the biggest archipelagic state in the world and highly prone to the impacts of earthquakes, volcanoes and tsunamigenic earthquakes. Meteorological hazards are common with flooding and landslides¹ frequent in the western Islands while drought is a persistent problem in many eastern areas which also suffer from strong seasonal winds. The archipelago is made up of 17,000 islands (of which 6,000 are inhabited) and with 230 million inhabitants has the fourth largest population in the world; 32 per cent of the population are under 18².

Since 2004 there have been 175,000 fatalities and US\$14 billion worth of losses in Indonesia (see Table 1). Major disasters include the tsunamis in Aceh (2004) and Nias (2005), an earthquake in Yogyakarta (2006), the Jakarta Floods (2007), the Java Floods and landslides (2008) and the Southern West Java and Padang Earthquake (2009). These caused substantial loss of life, injuries and economic damage. In addition, Indonesians, especially the poorest, are affected by many smaller disasters that do not achieve international recognition and yet cumulatively impact the lives and livelihoods of almost as many people as those affected by major disasters. And children, women and the elderly are disproportionately affected. In early 2008, over a period of two months, more than 80 emergencies occurred in Indonesia killing 73 people and affecting more than 96,000. Of this number, an estimated 19,000 of the displaced people were children³. This is similar to patterns observed in Aceh after the 2004 tsunami (Rofi and Doocy 2006; Doocy *et al* 2007).

The regular occurrence of geological hazards coupled with rising sea levels and the likely increase in severity and frequency of meteorological hazards due to climate change presents a significant challenge. As of 2009, approximately 440 of the 500 cities and regencies within Indonesia were situated on the coast (Subandono 2009). It is estimated that 42 million people live in the high risk coastal zone within 10 metres of mean sea level (Wingqvist and Dahlberg 2008). A growing population with a limited capacity to cope and adapt to multiple hazards means that Indonesia is more prone to disaster risk than ever before.

¹ Landslides are listed here under meteorological hazards although it is recognised that earthquakes also generate landslides in the region.

² According to UNICEF the total population of Indonesia under the age of 18 in 2008 was 74, 481,000 (www.unicef.org/infobycountry/indonesia_statistics.html, accessed April 2010).

³ Disaster News (2008), Indonesia Natural Disasters Database.

Table 1 Estimate of Indonesian national losses in ten selected disasters 2004–2008

(Source: www.em-dat.net ; Bappenas 2005, 2006; World Bank 2007)

Location	Hazard/ disaster	Date	No of deaths	No of affected people	Losses (million US\$)
Alor	Earthquake	12 November 2004	33	83,070	11
Nabire	Earthquake	26 November 2004	22	12,620	46
Aceh	Tsunami/ earthquake	26 December 2004	167,000	>500,000	4,500
Nias	Earthquake	28 March 2004	1,659		400
Jogjakarta	Earthquake	26 May 2006	5,900	820,000	3,134
Sidoarjo	Mudvolcano, Lapindo	Since May 2006	2		*3,616
Pangandaran	Tsunami/ earthquake	17 July 2006	600		400
Kalimantan and Sumatra	Forest fire	Since July 2006	7	Several thousand	**1,000
10 Provinces	Drought	Since June 2006	n/a	100,000	n/a
Aceh***	Flood	December 2006		512,879	121
Total					14,000

* Estimate in US\$ based on Greenomics analysis.

** Based on Greenomics calculations with loss assumption of US\$25 million a day due to forest fires in 2006.

***From Bappenas-World Bank 2007

Loss of school buildings in recent disasters

Lack of documentation concerning disaster losses in educational sectors, particularly school infrastructure, indicates a lack of commitment to the child protection policy as stipulated in the Child Protection Act 22/2003⁴

Post-disaster loss and damage assessments by the World Bank and the National Development Planning Board (Bappenas) following the 2004 tsunami (26 December), the Yogyakarta earthquake (2006) and the Aceh Flood (2006) reported damage to 3,951 school buildings, of which 2,383 were destroyed and 1,568 damaged (Table 2).

⁴ *Child Protection in Emergencies Due to Natural Disaster, Conflict/War and IDPs, Part V, Special Protection, Chapters 59-62*

Table 2 School buildings damaged in selected recent disaster events

Selected disaster events	Unit of school building damaged		
	Destroyed	Heavy and light damaged	Total damaged school buildings
Padang earthquake 2009	2,512*	n/a	2,512
Aceh/Nias (Indian Ocean tsunami 2004)	743	1323	2,066
Jogjakarta earthquake (2006) (total central Java and Jogjakarta provinces)	1621	56	1677
Aceh flood 2006	19	189	208
Total	4,895	1,568	6,463

*Either destroyed or heavy damaged

Source: Joint Report by the BNPB, Bappenas and the Provincial and District/City Governments of West Sumatra and Jambi and international partners, October 2009, *West Sumatra and Jambi Natural Disasters: Damage, Loss and Preliminary Needs Assessment*

Field locations

The research was conducted in two villages in Rembang in Central Java and two villages in Sikka on Flores Island in Nusa Tenggara Timur (NTT) (Table 3 and Figure 1).

Table 3 Research locations

Village	Sub-district	District
Dowan	Sale	Rembang
Pakis	Gunem	
Wolodhesa	Paga	Sikka
Mesabewa		

Figure 1

Map showing the locations of Sikka and Rembang



These locations were chosen by Plan Indonesia in consultation with the researchers and Plan UK. At the time of the research, all the villages where the fieldwork was conducted were taking part in pilot projects for the Child-Centred Disaster Risk Reduction programme supported by Plan UK⁵. Plan was also initiating its Mainstreaming Child Right and Participation project in Sikka district and integrating its DRR programme with an education programme in Rembang. It was felt that the children in these locations would gain the most from their involvement with the research project, compared to those who were not participating in a Plan programme. In addition, the two locations were chosen due to their vulnerability to a number of disaster risks and their contrasting religious contexts (Islamic and Christian).

Disaster context of fieldwork locations

Rembang is a mountainous area located in the northern part of Java Island covering 1,014 km². It is prone to landslides, floods, cyclones, drought and fires – both settlement and forest fires are serious threats. In January 2006, Rembang experienced its worst disaster in a decade with floods and landslides causing significant damage in nine out of 14 sub districts. Floods in 2007 and 2008 inundated and damaged at least 9,000 and 12,000 houses respectively, with the damage affecting 12 sub-districts.

Sikka is a coastal area, located in the Eastern Nusa Tenggara, Flores Island, covering 1,731 km². It is prone to earthquakes, cyclone, flash flood, landslide, droughts and tsunamis. In December 1992, a powerful earthquake (a magnitude 6.8 on the Richter Scale) struck Flores and triggered a tsunami resulting more than 2,500 deaths and 90,000 homeless people. Approximately 31 per cent of the total housing stock was damaged with 11–12 per cent of houses totally destroyed. Anecdotal data shows that about 25 per cent of school buildings collapsed⁶. Sikka was one of the most adversely affected districts as the epicentre of the earthquake was near the coastal town of Maumere, where 2,000 people died. In the aftermath of the disaster the former minister of economic coordination, Frans Seda, claimed: 'we have been put back into the pre-development era', a setback of over 20 years, reversing progress in economic and sustainable development.

Sikka is also exposed to volcanic activity due to its proximity to Mount Egon and Rokatende, both of which have been active in recent times. Mount Egon has erupted several times in the last six years with evacuations needed in 2004 and 2008. In addition to geological hazards, Sikka is particularly prone to climatic variability and regularly experiences long drought periods, recurrent storms and cyclones.

From December 2005 to April 2006, communities in the Sikka district were severely affected. An initial long duration drought was followed by a pest infestation that destroyed cocoa plantations, the main source of income in the community. The monsoon season then caused floods, landslides, a typhoon and coastal erosion. Damage to goods and livelihoods meant that 43,287 households (more than 210,000 people) suffered food shortages.

⁵ Plan began implementing its DRR programme in both locations at the beginning of 2008. Plan UK is spearheading an innovative risk reduction project in which children (via formal school settings and informal groups) are supported in their efforts to claim their right to safety and to campaign for disaster risk reduction. This project also involves integrating DRR within Plan's ongoing development work (including health, education, water and sanitation, child rights), ensuring child-centred disaster risk reduction approaches are a concern for all sectors

⁶ Rough calculations based upon data from the Satlak Office in Sikka.

Characteristics of fieldwork locations

Rembang district has a population of approximately 490,000 people and consists of 14 sub districts, seven of which lie along the coast. Table 4 has basic demographic information for Rembang. The area is predominantly Muslim. Economically it is dominated by the agriculture sector with chilli and mango as the dominant crops. The district is the second largest marine fish producer in the province and there are salt embankments along the northern beach⁷. The region experiences a prolonged dry season and often experiences water insecurity.

Sikka district has approximately 300,000 people, is predominantly Christian (Catholic) and is the knowledge hub for Flores Island. Basic demographic information for Sikka is also displayed in Table 4. Administratively it is divided into 12 districts, 12 sub-districts and 160 villages. Maumere is the region's capital and the largest town on the Island of Flores. There are five major sub-ethnic groups: Lio; Sikka Krowe; Muhan Tana Ai; Bajo-Bugis; and Palue. The district produces cacao, cashew fruit, coconut, rice, corn, cassava, sweet potato, soybean, peanut and mung bean.⁸

Sikka district has a rainfall of 700–1,500 mm a year concentrated into a hot wet season between November and April (Barlow 1991). This is followed by a hot dry season between May and October. Most of the agricultural effort is concentrated in the wet season. Sikka often experiences food and water insecurity. In some interior villages, water for household use is still harvested from banana stems.

Table 4 Basic demographic data for Sikka and Rembang⁹

Demographic indicators	Sikka 2007	Rembang 2005	National 2007
Population	295,134	597,213	231 million
Population density (people per km ²)	170,41	598	124***
Doctors per 100,000 population	11.69	11.56	19.59
Child mortality per 1000 population	62*	10	27**

* The child mortality rate per 1,000 people in Sikka decreased from 119 in 1977 to 87 in 1987

** The national child mortality per 1,000 people decreased from an average of 158 in 1971

*** 2,811 people per km², Java Island

⁷ Central Java Statistical Bureau: : http://jateng.bps.go.id/2006/web06bab105/web06_1050402.htm (accessed on 20 May 2009)

⁸ Central Java Statistical Bureau: : http://jateng.bps.go.id/2006/web06bab105/105agri_eng.html (accessed 20 May 2009)

⁹ www.ntt-academia.org/files/GDS2-NTT-Januari-2008.pdf www.ntt-academia.org/statistik-ntt.html

3.0 Research design and methods

The field research was conducted over a two week period (13–27 October, 2008) with approximately five days each in Sikka (Wolodhesa and Mesabewa villages) and Rembang (Dowan and Pakis villages).

The research team included: Dr Katharine Haynes, Risk Frontiers, lead researcher; Mr Jonatan Lassa, UN Bonn University, local Indonesia research partner; Miss Briony Towers, University of Tasmania, research assistant; and Mr Darmen Kelen, local translator.

Plan Indonesia had significant control over which children and adults were selected for interviews and the workshops. The participants were part of Plan's DRR/CCA project. However, it should be noted that this research was undertaken during the early stages of the implementation of Plan's child-centred DRR work in Indonesia. Due to time limitations, control groups were not involved. However, the research team had complete control over the format of the workshops, the questions asked and methods of enquiry employed. Plan staff were encouraged to be involved in the research process in order to build their capacity, although not as lead facilitators or translators. In addition, the potential bias of the methodology was reduced through the broad range of methods used. The research is considered sufficiently independent and the results robust.

Research questions

The specific aims of this research were twofold: first, to investigate the roles of children as agents of change in support of risk reduction and climate change adaptation and second, the influence of gender and culture in developing child-centred disaster DRR. The research was also intended to help create awareness of child-centred DRR in the locations studied, and this was fostered by the adoption of participatory research methods.

In addition, it was also designed to validate findings from previous missions in the Philippines (Mitchell and Haynes 2007; Mitchell *et al* 2009) and El Salvador (Tanner and Gaborit 2007; Mitchell *et al* 2009) and to contribute to the body of evidence in support of child-centred DRR and the Children in a Changing Climate (CCC) programme¹⁰. In order to provide a valuable collaborative perspective, this work is partnered with ongoing ESRC¹¹ funded research in the Philippines and El Salvador being conducted by the Institute of Development Studies in partnership with Plan International.

The utilisation of participatory action research with children (boys and girls) and adults (men and women) is built on the recognition of children as social actors for disaster risk reduction in their own right (Kellett 2005).

¹⁰ Children in a Changing Climate is a global action-research, advocacy and learning programme, bringing together leading research and development organisations with a commitment to share knowledge, coordinate activities and work with children as protagonists with a voice needing to be heard. Please consult the official website: www.childreninachangingclimate.org

¹¹ Economic and Social Research Council, UK based research funding council.

We asked three interrelated research questions:

- To what extent can the boys and girls reduce their risk and vulnerability?
- What experiences and capacity do boys and girls have for reducing risk in their locality?
- To what extent do gender and culture play enabling and disabling roles for child-centred DRR and CCA?

Methodology

We used participatory action research approaches and community risk assessment methods (Van Aalst, Cannon and Burton 2008) such as: modified participatory rural appraisals; child-friendly ice breaker activities to engage the participants and to glean basic demographic information; mind-mapping; community mapping; risk identification and ranking of priorities; creation of seasonal hazard calendars; mapping of risks, risk reduction measures and key actors. Focus group discussions and semi-structured interviews were also conducted. These sessions were recorded using digital voice recorders, video recorders, photographs, handwritten notes and typed notes.

The workshops were conducted in schools or local community buildings at the heart of the villages. Workshops were facilitated by the local Indonesian researcher in partnership with local Plan staff with whom the children and adults were familiar. Workshops were conducted in Bahasa or the local dialect, where possible. A local translator was hired so that non-Indonesian researchers could be involved. Workshop activities were carried out in small groups divided by gender so that the responses of male and female participants could be compared and to ensure that all participants felt comfortable contributing to the discussions.

Given the nature of the participatory research, time constraints and the different community dynamics in every village, not every participatory method was exercised in every selected village. Table 5 shows the methods used with different participants in the villages. Despite time constraints, the research team was able to extract detailed information from the research participants.

Table 5 Child and adult participants by age and gender

District	Village	Children				Adults			
		Average age	Oldest	No of participants	% girls	Average age	Oldest	No of Participant	% women
Sikka	Wolodhesa	13	15	17	53	49	70	22	45
	Mesabewa	17	19	13	46	39	58	16	38
Rembang	Dowan	11	13	20	50	31	45	17	47
	Pakis	11	12	10	50	38	90	17	47

Table 6 Selected methods utilised for different research participants

Selected methods	Inquiries	Adults	School children	Community leaders	District government	Religious leaders	Plan staff	DRR facilitators
The spider web	Basic demographic data and gendered household decision-making	X						
Mind mapping	<ul style="list-style-type: none"> risk identification and ranking what girls and boys can do to reduce risk decision making in households 		X					
Identification matrix	<ul style="list-style-type: none"> risk identification and ranking vulnerability and capacity of boys and girls 	X	X					
Semi structured interview	• DRR policy, practice and implication on boys and girls	X	X	X	X	X	X	X
Meta-cards exercise and matrix	<ul style="list-style-type: none"> what children can do to reduce risk DRR stakeholder and power mapping village vision over 25 years 	X	X					
Participatory risk mapping	<ul style="list-style-type: none"> village risk mapping local disaster history (matrix) local disaster calendar (matrix) 	X						X

The participatory research fostered learning processes in the four pre-selected villages. Child-centred DRR programming and research requires a participatory approach whereby the children are treated as stakeholders in the process of understanding risks and identifying and undertaking preventative actions. Parents, community leaders and religious leaders should also be included in this process as each of these stakeholder groups will have clear views and beliefs about the priorities for childhood and the types of DRR activities their children should be involved in. Given there are likely to be multiple perspectives on priorities for childhood within a community, the content and process of child-centred DRR programming should be flexible and directed by informed negotiation amongst stakeholders, including the children, their parents and other key decision makers and leaders within the community (Woodhead 1999).

Workshop participants

A two day workshop was conducted in each village. The numbers and demographics of the participants are shown in Table 6. On day 1, a workshop was conducted with the children on their own. On Day 2 the children and adults participated together.

4.0 Conceptual framework

Mitchell et al 2009 contains a literature review framing child-centred disaster risk reduction. This paper will add to this review by documenting the relevant themes in developmental psychology and children's geographies.

Social science, especially child psychology, provides a strong analytical framework for the question of how and why children are viewed by society. We will start by arguing that to be beneficial for children, policy and programming for child-centred DRR/CCA must be based on sound theories of child development (see next section).

4.1 Child development theories

There are different approaches to conceptualising child development and the challenge for child-centred DRR/CCA programming is to adopt one that adequately represents how children learn, think and behave, preserves their needs and rights, and promotes active participation in their communities. Two of the major approaches to child development are broadly represented by 'stage theory' and 'socio-cultural theory'.

The following sections describe the basic tenets of these two approaches and discuss their implications for child-centred DRR/CCA.

Stage theory: a universalist approach

Historically, the principle goal guiding the study of child development has been to identify the general laws of growth (Woodhead 1999). Jahoda (1992) tracing this 'universalist' perspective back to one of the underlying philosophical assumptions of the enlightenment – that humans are considered part of nature and, as such, subject to general laws that can be discovered within a positivistic scientific paradigm. Based firmly within this tradition, the dominant thesis on child development over the last half century has been that of 'stage theory', a perspective which sees a child's age and developmental stage as the most important predictors of children's capacities for skill and knowledge acquisition (Boyden 2003).

The most influential proponent of stage theory was Jean Piaget (1954; 1969). He considered child development to be governed by universal psychological and biological structures and marked by fixed stages, beginning at birth with sensory-motor action and culminating in adolescence with autonomous logical thought. Piaget considered each stage to represent a child's understanding of the world during that period with each but the last stage being an inadequate approximation of reality. Development from one stage to the next would arise from an accumulation of errors in the child's understanding of the environment catalysing a reorganisation of thought structures resulting in a new understanding of the world and a qualitatively distinct set of skills and capacities.

Research in the Piagetian tradition has largely focussed on investigating the ages at which these qualitative shifts in perspective occur and, by extension, identifying the ages at which children should be capable of certain skills or be ready to develop specific forms of knowledge and understanding (Rogoff 2003; Wood 1998). The underlying thesis is that attempts to teach the skills or knowledge of a later stage before previous stages have been transcended will not facilitate development or foster understanding (Wood 1998). The idea that children pass through stages of development and the assertion that they cannot learn or be taught how to function at 'higher' levels before they have passed through the lower ones has been widely adopted and has formed the basis for a theory of learning 'readiness'. This notion has dominated international policy on child care, education and welfare for many years (Boyden 2003; Singer 1992; Wood 1988).

In many instances, the contribution of Piagetian research and theory to policy and decision-making in regard to children's lives has been beneficial (Schaffer 1998). However, for the most part, this research has been conducted with children from middle-class communities in Europe and North America with the cultural context often neglected in terms of research questions, sample selection and methodology (Woodhead 1998). Yet, as Rogoff (2003) points out, much of this research has been generalised beyond the cultural context in which it was conducted with many researchers often claiming that 'children do this' as opposed to 'these children do this in this context'.

As Woodhead (1999) warns, extending theories and normative ideas about child development beyond the cultural and social context in which they were formulated should be done with caution, particularly when the purpose of doing so is to prescribe the 'developmental appropriateness' of particular learning experiences and activities or to make assumptions about children's 'needs'. Boyden (2003) agrees that the practice of taking Western (or any other cultural) expectations about children's capabilities (intellectual, emotional and social) as an inviolable standard to inform policy for other childhoods is highly questionable.

Socio-cultural approaches to child development

In the socio-cultural paradigm, human development is viewed as a cultural process with people developing as participants in the practices and circumstances of their communities (Rogoff 1990). Cultural context is not outside or peripheral to the process of knowledge development, but is an intrinsic part of it (Cole 1996). Knowledge is seen to be embodied in the actions, work, play, technology, literature, art, and talk of members of society and it is only through interaction with the more mature members that a child can acquire, embody and further develop that knowledge (Rogoff 2003).

Socio-cultural approaches to human development have their origins in the work of the Russian psychologist Lev Vygotsky (1978). A contemporary of Piaget, Vygotsky placed language and communication at the core of intellectual and personal development. Vygotsky's primary concern lay in understanding the nature, evolution and transmission of human culture. His perspective on psychology and human development reflected his interests in art, history, literature, cultural activity and sociology. These interests guided his views on the historical and cultural origins of the way in which people in different societies come to act upon, construe and represent their world (Wood 1998). Vygotsky's main contribution to educational theory is a concept termed the 'zone of proximal development'. He used this term to refer to a dynamic region of sensitivity where the child and their more skilled partners engage in joint activity that is just beyond the child's developmental level. When interacting under these conditions, the child is able to acquire knowledge or skills that they would not be able to acquire by working on their own (Vygotsky 1978).

This idea is in stark contrast to the view of learning posed by Piagetian theory, that a child is only ready to learn a particular skill when they have achieved the pre-requisite stage of development. In Vygotskian terms, learning readiness involves not only the state of the child's existing knowledge but also their capacity to learn with instruction. This instruction may be formal or informal and can be performed in many different contexts by more knowledgeable peers or siblings, parents, grandparents, friends, acquaintances and teachers. For as long as this instruction takes place in the child's zone of proximal development, there is, theoretically at least, no restriction on what can be learnt or at what level of detail.

The socio-cultural approach acknowledges that different cultural communities expect children to engage in activities at vastly different times in childhood. Rogoff (2003) cites numerous examples of childhood activities likely to be considered dangerous or developmentally inappropriate by western cultural standards. Among the Kwara'ae of Oceania for instance, three-year olds not only take care of younger siblings but take produce they have grown themselves to sell at market, thereby making a significant and valued contribution to the family income. The Aka tribe in central Africa teach their eight to ten-month old infants how to throw small spears and use small pointed digging sticks and miniature axes with sharp metal blades. Among the Efe communities in the Democratic Republic of Congo, infants are routinely taught to use machetes safely; infants in the Fore communities in New Guinea are able to handle both knives and fire safely by the time they can walk.

These examples highlight the need to consider and understand child development as a product of specific economic, social, ecological and cultural processes. It should be noted that the socio-cultural approach does not discount the significance of universal maturational processes. Rather, it emphasises that child development is shaped by human action and social processes that are mediated by complex belief systems including those pertaining to the 'proper' ways in which children should develop (Woodhead 1999).

Implications for DRR/CCA

Children's capacity for DRR/CCA will, as for any other activity, depend largely on routine circumstances in their community and on cultural practices they are used to. Capacities will also depend on the cultural meaning given to disaster events and the social and institutional support provided by communities for learning and carrying out risk reduction activities. Thus, a child's understanding of disaster risk and his or her capacity for risk reduction is likely to differ across communities. It is important then that programmes are built around the socio-cultural contexts of children's lives and guided by children's perspectives. What disaster risks are of biggest concern to them? What do they perceive as the causes and consequences of these disasters? What do they think can be done to prevent them? And what actions do the children see themselves capable of in terms of this prevention?

The socio-cultural approach to child development may prescribe a policy framework within which to think about child participation in child-centred DRR/CCA. This approach adopts an interdisciplinary orientation drawing on the conceptual and theoretical perspectives of anthropology, cultural studies, sociology, education, history and gender studies. Each of these disciplines has a unique contribution to make to our understanding of the diverse ways in which children understand and interact with disaster risk.

An additional frame from which to view child-centred DRR is provided by human geography, in particular, advanced research on children's geographies (see section 4.3). This approach focuses on issues that impact upon the geographical worlds of children and young people, emphasising the importance of place and space. As with socio-cultural psychology, human geography cuts across interdisciplinary boundaries bringing together research in sociology, anthropology, education, psychology, legal studies, social policy, political science, urban design and architecture. Adopting an interdisciplinary approach enables new insights into the diverse and multiple realities of young people's lives and how child-centred DRR/CCA can be facilitated at an individual, family and community level.

The intention was to focus this research on gender and cultural aspects. Religion is considered here as part of a broader cultural product. The research design implicitly signals the use of socio-cultural approaches.

4.2 Children and social cultural context

Children as an age category

Age is an important factor when considering how community members live with and manage disaster risk (Peek 2009). Whilst avoiding the aforementioned issues associated with the Universalist approach to child development, it is useful for practical reasons set in the political and legal context to categorise children as any person under the age of 18. Many researchers and authors make further distinctions. Peek (2009), for example, distinguishes between 'infants and very young children' (0–5 years), 'young children' (6–11 years) and 'adolescents' (12–18 years).

It is important to recognise that age is not a stand-alone category but interacts with many other factors including gender, knowledge, culture and morality. Yet, 'the length of time that someone has lived can significantly affect that person's ability to prepare for, respond to and recover from disaster' (Peek 2009). From this perspective, adolescents are assumed to have a greater capacity than younger children when it comes to risk reduction. However, adolescents can also be risk producers, engaging in behaviours and activities that contribute to risk in their community. It is important to note that within the Philippines and El Salvador, the child contribution to risk reduction is undervalued in comparison to adults' due to what Bass (2004) calls 'socially constructed age hierarchy'¹³.

Legal context and the moral argument

The age of 18 is often set as a legal boundary while those under 18 constitute a unique position under the law. Once a child turns 18 (or 16 as is the case in Indonesia and some other cultures), they are treated legally as adults. In democratic political systems, the voting age is commonly 17 or 18.

Children are considered immature in terms of moral development and therefore at risk from moral intrusion and exploitation by adults and peers. In her paper detailing the cultivation of young schottas (shooters) in Jamaica's violent 'garrison' communities, Moncrieffe (2008) demonstrates how deep-rooted economic and social inequalities, together with the perception that gun violence is a means to personal liberation, create conditions whereby children are readily inducted and cultivated as street soldiers and combatants.

In the Indonesian legal context, the distinct legal category of the child is endorsed by the Children's Court Act (No. 3/1997) and the Child Protection Act (No. 23/2003). The Child Protection Act states that children are those who are under 18 years old, including those in the womb. Those in the womb can be either a foetus or an embryo. The inclusion of embryo in this definition is because, in general, society is still pro-life. According to the Act 23/2003, child protection is defined as 'all activities to ensure and protect children and their rights to live, grow, develop, and participate, in accordance with the optimal dignity and the dignity of humanity, and to protection from violence and discrimination'. In addition, the Indonesian Disaster Management Act positions children as a vulnerable group that need protection.

¹² UNCRC definition of a child: a person under the age of 18.

¹³ See discussion about age hierarchy in livelihood context in Bass (2004) and Abebe and Aasea (2007)

The Child Protection Act guarantees child protection during disaster emergencies and displacement. The Act is in line with international treaties on child rights, including the United Nations Declaration of the Rights of the Child (DRC) and the more recent United Nations Convention on the Rights of the Child (CRC).¹⁴ The DRC represents a major shift in recognition of children's rights. It reflects a change from the perception of children as mere 'objects' or 'little adults' to a view that they are people who deserve not only as equal protection as adults have, but special protection due to their vulnerability. The CRC took this further and represents children as entitled to fundamental rights that must be protected. Children have agency with a voice that must be listened to (Mitchell *et al* 2008).

The gender argument

Children are not gender neutral and as such boys and girls differ greatly in terms of their vulnerability and resilience to disaster risk. As has already been mentioned, gender differences are often seen in post-disaster impacts where women are disproportionately represented in terms of deaths and injuries. The answer to the question, 'What does gender have to do with disasters?' is 'everything' (Enarson 2009). There is a substantial body of evidence on gender differences and inequality across the disaster cycle – pre-, during and post-disaster (Fothergill 1996; Enarson, Fothergill and Peek 2007).

Interplays of gendered poverty and child poverty with powerlessness, class, race and ethics may result in greater vulnerability of both boys and girls. However, girls are often denied the basic privileges and opportunities that would foster their resilience to disaster risk. In some cultures, discrimination starts at birth, with boys more valued than girls, this affects girls' rights to survival, development and protection. Research has shown that mortality rates are higher for girls than boys (Bartlett 2008; Zahran, Peek and Brody 2008). Issues of race, class and ethnicity also come into play. For more discussion on these issues, the reader is referred to Bolin (2007).

Care should be taken when converting the analogy of men and women in gender studies to the study of childhood girlhood and boyhood. Kong (2000: 231) concluded that children 'deserve to be understood first as a separate group and then as a group which in itself is differentiated according to varied characteristics, such as gender, race and context'.

4.3 Children's geographies

Children's Geographies is the study of children in their relation to space or place. Generic phrases such as 'school children' or 'street children' reflect the children's mobility in space, a space where disasters may take place.

Whatever theory of human development one subscribes to, it can be assumed that one's stock of knowledge and information accumulates with age and thus children's knowledge of disaster risk will be less than adults, especially concerning local geography and the historical profile of recurrent local hazards. However, caution should be exercised in making this assumption as within developing and under-developed country settings, it is likely that, in the past, children – now adults – did not have the same levels of formal education as children do today. In Indonesian secondary schools today, adolescents

¹⁴ The United Nations Convention on the Rights of the Child (UNCRC) is a comprehensive, internationally binding agreement on the rights of children, adopted by the UN General Assembly in 1989. It incorporates children's civil and political rights (such as treatment under the law); social, economic and cultural rights (such as adequate standard of living); and protection rights (from abuse and exploitation). It has been ratified by 189 countries, including Indonesia in 1990 (presidential decision 36/1990).

are exposed to significant hazard and climate change knowledge through geography and science subjects. In addition, the Consortium for Disasters and Education is working on integrating DRR into early childhood care and development (ECCD) and primary education.

Studies comparing levels of child and adult knowledge have not yet been conducted in Indonesia in the context of DRR. However, given the shift in levels of, and access to, formal and informal education over the last few decades (including greater access to media and new ICTs, development of DRR curricula in limited projects and so on), it is not implausible that within defined settings, children's knowledge may surpass that of adults when it comes to disaster risk assessments and hazard mapping. But the issue is not about who has most knowledge about risk, or who has most access to risk information, but how children and adults share their knowledge and experience of the risk. This is particularly relevant with regard to the challenge of indigenous knowledge being lost due to weak intergenerational dialogue and increasing migration.

Children's participation in community mapping including risk mapping, communication and planning is vital to DRR/CCA. Travloua and colleagues (2008) demonstrated the strengths of mapping exercises with young people. Their research in Edinburgh, (Scotland) and Sacramento (California) found that mapping exercises combined with focus groups produced a rich collection of data on the ways in which young people perceive and represent their local environment. Participants demonstrated a high degree of ecological and spatial literacy – addressing political, cultural, social vulnerabilities and challenging the fatalism and 'complacency' of adults (Travlou et al 2008; Mitchell et al 2009).

4.4 Religion and risk consciousness

According to Chester (2005:319), 'religion is an essential element of culture and must be carefully considered in the planning process and not simply dismissed as a symptom of ignorance, superstition and backwardness'. Campbell-Nelson (2008: 4) argued that:

'Categorising disaster by cause is further complicated when we take the interpretive role of religion into account. From a secular point of view we could construct a continuum from purely natural causes on one end to human-induced (political, social, economic) causes on the other. However, religious perspectives introduce other possible agents that may seem highly realistic to local populations.'

Religion can play an important role in shaping children's understanding of the earth's dynamics (Chester 2005) A useful framework within which to consider the role of religion in risk consciousness can be borrowed from Paulo Freire's conscientizacao that stratifies consciousness at three levels: magical, naïve and critical.

- A magical consciousness may assume that 'volcanoes and disasters are acts of God'.
- A naïve consciousness may assume 'children are too small to deal with disaster risks'. Religion may shape peoples' understanding in a way that leads to a magical and/or naïve consciousness to risk.

- Critical consciousness, by contrast, is the notion, for example, that the Jogjakarta earthquake disaster could have been prevented if houses had been built to resist seismic shocks.

Garcia-Acosta (2002) noted the variety of views of disasters in Mexico, where the religious response to earthquakes as acts of God – especially the case in the 19th Century – led to enormous processions after disasters and mass praying to patrons against earthquakes. This has changed due to the growing secularisation of Mexican society. In the Oakland Firestorm in California 1991, where property damage reached US\$1.5 billion, Hoffman (2002:132) shows that the at risk community reiterated the long-rooted Western and Judeo Christian belief ‘that disasters take place because of moral malfeasance.’ The belief that disasters demonstrate divine power and divine intervention still prevails on many occasions. Such beliefs were evident after the 2004 Indian Ocean tsunami and the Jogjakarta earthquakes. In Indonesia, where religion has a significant role in society as stated by its constitution, evidence of magical consciousness of disasters is shared by adults and children.

With these arguments, we have returned to the debate between Voltaire and Rousseau of 250 years ago following the tsunamigenic earthquake in November 1775 in Lisbon, one of the foremost cities in Europe at that time. Voltaire described the event as a ‘problem of evil’, of divine intervention to deal with the pride of sinful men. Rousseau responded by arguing ‘that nature did not construct twenty thousand houses of six to seven stories there and that if the inhabitants of this great city had been more equally spread out and more lightly lodged, the damage would have been much less and perhaps of no account’ (Masters and Kelly 1990 cited in Dynes 1999:13).

The influence of religion on the perception of risk is exercised through its narratives. Dynes (2003) noted the narrative of the ‘big flood and Noah’s Ark’ in which he claimed that Noah’s Ark provided a ‘central cultural image of disaster for those in the Western World’. However, we argue that religion is an adult institution. Looking at today’s adults (children of the past) and their magical construct of disaster risk including fatalism, one should be aware of the role of religion in the fabrication of children’s risk perception, but religion is not the only source of disaster narrative.

4.5 Children as risk communicators: policy context

Within the research context of social work, Goode (1994) argues that research concerning children is often adult-centric because researchers ‘typically do not seriously address the lived reality of children as children.’ In addition, Goode argues that ‘all social constructions of children are often developed from specific situations in which adults interacted with children’ (Goode 1994:700). This kind of ‘adultism’ is certainly apparent in DRR where the rules of the game are still shaped by adult institutions.

Recognition of child participation within post disaster management communities is often channelled through ‘Education’ clusters where international child focused NGOs are key players, such as UNICEF, Save the Children and Plan International (Stoddard et al 2007).¹⁵ In pre-disaster risk reduction activities, the conventional community-based approach lacks a vision of children as important contributors to building community resilience. Children are not part of the structure of decision making processes in pre and post disaster risk management. The absence of children within the decision making process of disaster risk management signals the presumption that adult-dominated organisations still treat children as incapable agents who lack the capacity to reduce risk.

¹⁵ The cluster approach is part of humanitarian reform agenda. See www.odi.org.uk/hpg/papers/hpgcommissioned-OCHA-clusterapproach.pdf (accessed 7 March 2009).

Socio-cultural context rather than age is being increasingly accepted as the most powerful source of differentiation between children in terms of behaviour, thought and adaptation (Valsiner and Rosa 2007). This approach would inevitably result in opportunities for child-centred DRR/CCA being overlooked or deemed as developmentally inappropriate. It could also result in the undermining of local conceptions of childhood that would be counterproductive. child-centred DRR/CCA will only be successful if it is compatible with local (families and communities) culture, values and priorities, particularly as they are realised through their own local structure and local routines (Guralnick (2006). By contextualising childhood and attending to the practices and activities that children engage in within their communities, child-centred DRR/CCA programmes can capitalise on existing capacities and abilities and accommodate or overcome constraints.

The attitude to children within the disaster risk reduction and climate change adaptation movement is slowly shifting from protectionism to protagonism (Mitchell et al 2009; Tanner 2010). The shift marks the understanding that children and youth are not passive victims and have an important role to play in communicating risks or in reducing risks and responding to disasters (Anderson 2005: 168). Research is gradually showing that children may surpass adults in terms of the skills and capacities (Kruger and Chawla 2005; Kellett 2005) needed to reduce disaster risk at the community level. However, as Mitchell and colleagues (2008) point out, it is important that participating in child-centred DRR does not unduly burden children with responsibilities ordinarily afforded to adults alone and deprive them of their need just to be children. It is noted, however, that in many cultures, children often take on responsibilities including household chores, supporting income generation and caring for younger siblings and other relatives.

Current research on child-centred DRR and climate change provides more questions than answers as to the suitability and feasibility of children as DRR protagonists. However, current research does show the beneficial role of informed children as risk communicators (Anderson 2005: 169; Mitchell et al 2008, for example). Children can also be dynamic agents for change: their unadulterated views and often 'politically free' position can serve as a powerful tool for message delivery and challenging the status quo. Moreover, children, who are ignorant of hazards and risk reduction measures, are likely to be at a greater risk when disaster strikes (Peek 2008; Wisner 2006). See Mitchell et al (2009) for a full literature review and discussion on these issues.

5.0 Research findings

This section presents the findings from two weeks of independent research work carried out in Indonesia in 2008 (Sikka and Rembang) in partnership with Plan, in response to the research questions:

To what extent can boys and girls reduce their risk and vulnerability?

What experiences and capacity do boys and girls have for reducing risk in their locality?

To what extent do gender and culture play enabling and disabling roles for child centred DRR and CCA?

Despite knowledge gained by the children through risk education and risk reduction programs initiated by several Civil Society Organisations (CSOs) and agencies, children face many cultural and institutional barriers to communicating disaster risks to their parents and the wider village community. In Sikka and Rembang parents tend to favour more traditional risk communication pathways through adults, often overlooking children's knowledge and ability to reduce disaster risk as 'they are still small' (as explained by parents in Mesabewa and Wolodhesa in the village workshops). They credited older children with a greater capacity for reducing risk and attributed this capacity to increased levels of knowledge. At a community level, government agencies still focused on adults, leaving children as passive agents with lack of capacity to deal with disaster risk.

Children as risk producers and risk reducers

The research aimed to validate the findings concerning children's roles as risk reducers using participatory and child-friendly processes, asking children what they could do to reduce risks. When first asked, many of the children felt that their capacity to reduce risks was limited: 'We are too small to reduce disaster risks', girls in Wolodhesa, Sikka said.

However, through further probing we identified that children of all ages played significant roles within the home such as being primarily responsible for caring for livestock, obtaining drinking water from the river, collecting firewood from the forest, taking care of their younger brothers and sisters and undertaking typical chores such as cleaning the home. This reaffirms the notion that children already play an important role within their households and community and that risk reduction activities would be a simple extension of this responsibility. 'Children can save cows situated near the riverbank if they are in danger from the flood waters', said an adult male in Sikka, when asked what children can do to reduce disaster risks.

In Mesabawa, the children's group (aged 15–18) stated that they have some responsibility for the rate of deforestation in the landslide prone areas, as they are expected to gather the firewood and therefore decide which trees to cut and where. 'We can also choose which trees to cut when we go to collect the firewood either afterschool or during holidays. But we can also plant trees and not burn the forest', said a 17-year old boy in Mesabewa

Children often help their parents clear the land. However, children in Sikka explained that they had been trying to communicate with people in the community about the dangers of deforestation and particularly about fires, which are often allowed to burn out of control.

When asked to brainstorm activities that they could carry out to reduce risks, children came up with a number of actions. Although are related to preparing and responding to disasters, many are also related to reducing risk in advance of a crisis (Table 7a). No discernable gender differences between girls and boys were noted in these activities identifying equal roles in preparedness, prevention and risk reduction and response.

Table 7a Mesabewa village: children’s views of what boys and girls can do to reduce disasters

What boys can do to reduce disasters		What girls can do to reduce disasters	
According to girls	According to boys	According to girls	According to boys
<ul style="list-style-type: none"> • clean rubbish around the river • replant trees that have been cut down • help victims by donating food and clothes • participate in solving problems, for instance, do something to reduce risk • plant trees • report to the community about risks 	<ul style="list-style-type: none"> • report to local government about risks • help in preparation • work closely with other community members to fix things that are broken or destroyed • flood: plants tree along the riverbank • landslide: reforestation • throw rubbish in the proper place • conserve nature • keep away from standing water • don't eat rotten food • donate food for victims 	<ul style="list-style-type: none"> • report to the local government • fix things, plant trees in water sources • clean standing water • work with other community members • help victims • tell the owner whose animals or fields are destroyed by flood and landslide • plant trees along the street • plant trees along bank river • conserve nature • try hard to cope with disaster • not to cut down trees • conserve nature 	<ul style="list-style-type: none"> • help damp down house fire • earthquake hazard: help vulnerable people • work together with other community members to cope with every problem • not cut all the trees • conserve nature • help those who are carried away by the flood • keep surroundings clean • clean the water channel • report to Plan so they can help victims • work together with other community member to help victims

Table 7b presents remarks showing how adult men and women view the roles of girls and boys in relation to disaster risk reduction. Some male adults said: ‘girls can’t escape from disaster’; ‘girls just scream, frightened, asking for help’; girls can only ‘help to remove light things and materials’. While their views were that boys can do the heavier stuff, including carrying heavy things, evacuating children and the elderly, removing livestock from the affected areas, only one male adult claimed that girls and boys can’t escape from disasters. Female adults viewed girls and boys differently than did adult males and were more positive about the roles of children in DRR, including girls (Table 7b).

Table 7b Mesabewa village: adults' views of what boys and girls can do to reduce disasters

Things girl can do to reduce disasters		Things boys can do to reduce disasters	
According to men	According to women	According to men	According to women
<ul style="list-style-type: none"> • Can't escape from disaster • Girls just scream, are frightened and ask for help • help to remove light things and material • help cooking in the public kitchen • help the victims • save themselves when disaster occurs • report to village leader and local government • give suggestions on DRR programme during village meeting 	<ul style="list-style-type: none"> • don't throw away rubbish anywhere • are involved in conserving nature • carry things to a safer place • carry light things to a safer place • help evacuate small kids, girls should save themselves • help by washing dishes • help to evacuate elderly people 	<ul style="list-style-type: none"> • can't escape from disaster • help adults carry heavy things • help evacuate children and elderly people • remove livestock from disaster area • help their parents removing things that could be saved • give suggestions on DRR programme during village meeting • report to village leader and local government to get response • help damp down fire • run to their wet rice field to save animals, but due to big floods can't do anything 	<ul style="list-style-type: none"> • remove things to a safer place • clean away any broken things • give suggestions to village leader to reduce disaster • report to government • help fix broken houses • carry heavy things to a safer place • give suggestions to government so they can donate things to victims such as food and clothes

We then reframed the question to every child, asking: 'If you were an adult today, what would you do to reduce risks?' This question was asked after our experience with one group of children in Dowan where they stated that children are physically too small to reduce risks. However, as seen in Table 8, children's responses to the reframed question closely resemble their responses to the original one. In Dowan, when asked the question: 'If you were an adult, what would you do to reduce disaster risk in your village?' girls tended to have more ideas than boys.

Table 8 If I were an adult, what would I do to reduce disaster risks (Dowan)

If I were an adult...	
Boys	Girls
<ul style="list-style-type: none"> • I would plant many trees so there would be no landslide. • I would be aware and pray so there would be no disaster. • I would conduct a community meeting on how to be more prepared for disasters. • I would keep a safer environment by doing reforestation. 	<ul style="list-style-type: none"> • I would conserve nature. • I will not carry out illegal logging so disaster would not occur. • I would plant more trees and would not cut down all trees. • I would plant trees so there would be no landslide in this village. • I would clean rubbish from the drains. • I would ask all people in this village to build an embankment so there would be no flood. • I would not throw litter everywhere. • I would tell my kids not to throw rubbish everywhere.

Children’s risk priorities

Children were able to identify disaster risk priorities easily. As shown in Table 9a, there are discernible differences in risk priorities between boys and girls. When questioned about the rationale underlying their prioritising of risks, interesting gender differences between the girls and boys and mothers and fathers became apparent. Tables 9a and b illustrate examples from Pakis, Rembang.

Table 9a Risk ranking for the children of Pakis village

Ranking	Most frequent		Most dangerous		Priority to deal with	
	Boys	Girls	Boys	Girls	Boys	Girls
1	Typhoon	Landslide	Drought	Landslide	Flood	Landslide
2	Landslide	Typhoon	Earthquake	Typhoon	Landslide	Typhoon
3	Earthquake	Drought	Landslide	Flood	Forest Fire	Drought
4	Drought	Earthquake	Typhoon	Drought	Typhoon	Earthquake
5	Flood	Flood	Forest Fire	Earthquake	Drought	Flood

The girls were consistent in their prioritisation and stated that landslide was the most frequent and dangerous hazard, as the risk of the bald (deforested) hill, situated above their village was very clear to them. They felt that landslide risk should be ranked as number one. In comparison, the boys identified landslide as the second most frequent and third most dangerous hazard. In terms of prioritisation, they felt that it should take second place after flooding. When questioned as to why they had prioritised flooding, despite rating it as the fifth most frequent and least dangerous hazard, boys from Pakis answered:

‘Because it is easier to deal with... if you don’t throw rubbish in the drains and channels then the water will be able to get away and it would not flood. Landslides are more difficult than floods to deal with’.

To prioritise risks, the girls concentrated on the consequential impact of the level of danger posed by the hazard whereas the boys focused on the relative ease of dealing with the problem.

An interesting debate was initiated during the adult's presentations concerning their risk priorities in Pakis, Rembang. The female groups strongly questioned why the male groups had not put dengue fever at the top of their lists and argued that this was not logical or based on actual experience. Women felt that dengue was a more extreme risk than flooding because floods are localised to certain areas of the village whereas dengue can spread quickly throughout the whole village. In comparison, the men agreed (together with the boys and the district government) that flooding was the top priority. The women felt that another possible explanation for this difference of opinion was that the women are the predominant carers when someone gets ill and therefore they have much more direct experience of the risk; dengue is less visible to the men. See Table 9b for the differences in risk priorities between men and males and females.

The district government also listed political conflict as their fifth risk priority whereas this was not identified by the children or adults as a risk. The political risk arises from the precipitation of conflict related to local elections, which is not unique to Rembang alone as other districts in Indonesia have experienced this.

Table 9b Example of risk priorities by different actors (Pakis village)

	Boys	Girls	Adult males	Adult females	District government	Consensus (rating processes)*
1	Flood	landslide	Flood	Dengue Fever	Flood	Flood
2	landslide	Typhoon	Drought	landslide	Typhoon	landslide and drought
3	Forest fire	Drought	Dengue fever	Drought	Drought	Typhoon
4	Typhoon	Earthquake	Plant disease	Plant disease	Fire	Forest fire
5	Drought	Flood	landslide	Typhoon	Political conflict	Dengue fever

* Rating based on the calculation in which the highest scores five points and the lowest scores one

In Pakis, the children did not mention 'everyday risks', whereas in Dowan the children discussed rat attacks and stealing as frequent dangers. However, when listing their priorities for action the children in Pakis and Dowan had similar views but with some small gender-related differences.

A similar pattern was seen in Sikka, where children in Masabawa, especially the girls, were more concerned with every day threats and prioritised road accidents, malaria and diarrhoea as the most important. In Wolodhesa, all children, including the girls, were more concerned with seasonal risks such as fire, drought, flood and landslide.

In Pakis and to a lesser degree in Wolodhesa, children tended to focus on lower probability but high consequence hazards such as landslides as opposed to prioritising more everyday risks, such as road accidents, as they did in the other villages.

Causes and solutions: what children can do

In Dowan and Pakis, the children demonstrated their capacity for understanding some of the more complex issues associated with disaster risk reduction.

‘Sometimes my father goes rock mining and this can cause a landslide but it also means he gets money and this is good for our family and our village. When the crops die in the drought we need to get money from rock mining’.

In Dowan, children were asked to discuss the causes and consequences, possible prevention strategies, the people responsible for reducing the risks and the channels of communication used between them in relation to each hazard.

As shown in Tables 10 and 11, the boys stated that reforestation will reduce the risk of landslides, strong winds, drought and floods; controlled and reduced slash and burn practices were suggested for fire management. Girls suggested a more specific set of actions to reduce the risks mainly considered to be caused by human mismanagement (Table 10). For the girls, drought is caused by wasting water rather than a lack of rain, as was suggested by the boys. This gendered differentiation could be explained by the different roles expected of boys and girls: boys are more exposed to activities outside the home, particularly deforestation when collecting firewood.

When asked how to best communicate with the responsible stakeholders, girls suggested more practical efforts for direct two-way communication (including identifying their role as risk communicators) compared to the boys who only discussed indirect one-way communication through the mass media such as radio, television and newspapers.

Table 10 Boys group: causes and solutions, Dowan village

Hazard and risk	Cause	Consequences	Prevention and mitigation	Responsible actors	How to communicate
1. Landslide	Deforestation	Death	Reforestation	All community members	Announcement on a public information board
2. Fire	Uncontrolled fire	Everything burned out	Controlled burn		Announcement on the radio
3. Strong wind	No trees to protect us and reduce wind	Houses destroyed	Reforestation		Announcement on the TV
4. Drought	No rain	People can't plant anything or farmer can't farm	Reforestation		Announcement in a newspaper
5. Flood	Deforestation	Flooding out	Reforestation		Announcement in a newspaper

Table 11 Girls' group: causes and solutions, Dowan village

Hazard and risk	Cause	Consequences	Prevention and mitigation	Responsible actors	How to communicate
Landslide	Deforestation	No trees in the forest	Don't do illegal logging Don't mine stones	Head of village, head of sub-village and all community members	Encourage people to conserve the environment
Forest fire	Fire used to clear the land	Trees and houses are burned out and people would have no place to stay	Don't burn everything		Ask the community to discuss in a meeting how we can stop forest fires
Flood	Throw rubbish everywhere and deforestation	All village flooded out	Throw rubbish in the right place; don't cut down all the trees in the forest		Tell all community members not to throw rubbish everywhere
Disease	Don't keep a healthy lifestyle	Community gets diseases	Keep a healthy lifestyle		Discuss with community members about a healthy lifestyle
Drought	Waste water	Community experience water scarcity	Frugally use water		Tell community members to frugally use water

Intra family and intra-community risk communication

In Rembang, some parents and children were interviewed together with the aim of investigating intra-family communications. Although the findings from these discussions should be interpreted with caution, anecdotal evidence suggests that although some children have had more access to disaster risk education than their parents, they are not automatically actively sharing this information within their families. However, it must be noted that the research in Indonesia was conducted very early on in the roll out of the risk reduction programme and communication between children and parents may now be better. We also identified a similar pattern to that in the Philippines and El Salvador, where children tend to discuss issues with their mothers rather than their fathers. Box 1 below shows an example of a discussion with a family in Dowan. Interestingly, although the father was present, the mother answered most of the questions.

Present for the interview: mother, father, one other villager (could be family), three researchers and two Plan staff.

Gender

In each village visited, girls, boys, men and women were asked to do an actor mapping exercise for stakeholder analysis. The horizontal axis of Figure 2 is divided into two columns (actors who are beneficial to risk reduction efforts in their village and actors who impede or obstruct risk reduction efforts). The vertical axis shows the three levels of power (high, medium and low scale) that influence decision-making. In Rembang, most agreed that village heads, forestry companies and village forest councils are stakeholders with the highest level of power and influence whereas young people only have a modest influence on heads of school and health workers.

Figure 2

Girls’ actor mapping in Pakis, Rembang. The x axis denotes ability to reduce disaster risks – girls are placed well below boys.



The workshops were proportionately attended by girls and boys, females and males. However, almost all the participants, including the girls themselves, think that girls and women are less able to deal with disaster risks than boys and men. An example of this is shown in Table 12 and Figure 2.

It was recognised that girls are able to identify, communicate and discuss risk-related issues as well as boys. However, with the exception of Pakis, participants felt that women possess a reduced ability compared to men. In Pakis, the women attending the workshop were an elite group of females, who held important roles within their village. In the other villages, the barriers to women’s engagement included poor literacy levels and a general lack of confidence in airing their views.

Table 12 Children’s views of the comparative roles of boys and girls (Wolodhesa village).

Selected roles	Girls’ group –views on girls’ capacity in comparison to boys	Boys’ group – views on boys’ capacity in comparison to girls
Participation in today’s activity	More patience	Stronger views
Communication skill	More skilful in communicating	Less skilful in communicating
Cleverness	Study a lot	Play more
Ability to face disaster	Weaker	Stronger
Physical endurance	Weaker	Stronger
Role in the family	Unable to make decisions	Able to make decisions
Ability to control emotion	Emotional	Able to control emotions
To become president	Girls can’t become president because they are weaker	Reasonable to think boys can become president as they are stronger

Based on the findings above, children seem to develop gendered norms, regardless of their capacity building or exposure to knowledge and information. Consequently, CSOs will face significant challenges in reducing gendered vulnerabilities to disaster risks in the future. In Pakis, where the village head is a female, claims of gender

Box 1**Section of an interview with a family in their home in Dowan village, Rembang**

Q: What activities has your child been doing with Plan?

A: Mother He has joined the Scouts and has training in the village, but I don't know what they have been doing. He didn't tell me and I didn't ask. Yesterday Sofii said he discussed natural disasters but didn't tell us any more about what he had discussed.

Q: Did he tell you or his dad about yesterday?

A: Mother He told me, he never tells anything to the father (all laugh) ... Sofii tells me stories because his father is a farmer and is often away from home.

Q: Did you then tell your husband about what you had been doing?

A: Mother No when there is training for Sofii I never tell my husband.

Q: What do you think about what Plan has been doing in the village?

A: Mother I don't know what Plan is doing in the village.

Q: So how do you know Plan doesn't do bad things with the children?

A: Mother I know Plan is good because they do things about cleanliness and hygiene.

Q: Have you learnt anything else from Sofii?

A: Mother No, usually when I ask he just says it's a Plan activity and that's it.

equality are undermined by the reality that women's views and abilities are considered subordinate to men's.

There was an interesting debate between adult females and adult males regarding risk priorities in the village. Based on our judgement, the ranking exercise shows that the gender division of roles affects the prioritisation of risk. For instance, men were more sensitive to agricultural risks (such as plant diseases and pest attacks) while women were more sensitive to health risks and wellbeing (epidemics such as dengue fever, for example). See Table 13, below.

Table 13 Risk ranking by adults, Pakis village

Ranking	Frequency		Danger	
	Men	Women	Men	Women
1	Flood	Landslide	Landslide	Dengue fever
2	Landslide	Flood	Drought	Landslide
3	Wereng pest	Typhoon	Dengue fever	Drought
4	Fever	Dengue fever	Plant disease	Disease
5	Drought	Drought	Typhoon	Earthquake

Inter-generational risk knowledge transfer

The transfer of inter-generational knowledge concerning disaster risk is complex and difficult to achieve.

The desired hypothetical model is simplified as follows: at a household level, parents tell their children of past disaster experiences, while children (depending on their age and how much knowledge they have gained in school and in informal learning settings) share information with their parents on how to be better prepared and mitigate against disaster and climate risks. Within the community, elders share past disaster experiences with

younger adults and children that recent generations may not be aware of. Therefore a 'balanced' level of participation – including children, adults and older people – should guarantee inter-generational learning from past disaster experiences.

In reality however, cross and inter-generational transfer of disaster risk knowledge does not take place as such. Socio-cultural and demographical factors such as gender and the local economy play important roles in modifying the dynamics of inter-generational learning. For instance, in Sikka, especially in Mesabewa village, where 50 adults (mainly women) are now working outside the village – as far away as Hong Kong and Malaysia in some cases – migration is a growing challenge.

Our interviews provided insight into the communication barriers between children and their parents in Indonesia, illustrating that children do not often share the details of what they do in school; nor do they tell their mothers what they do at Plan's disaster risk reduction education activities. A mother in Dowan stated, 'I believe Plan's agenda for the children is good, so I did not ask detailed questions.' However, within child-parent exchanges that do take place, it was found that most girls and boys preferred to share what they do in schools with their mothers rather than their fathers. It should be acknowledged that direct communication between parents and their children is a global challenge.

The loss of inter-generational indigenous knowledge was confirmed in Sikka district where most children and young adults didn't know about water harvesting from banana trees, whereas this would have been common knowledge amongst this age group 20 years earlier. A group of women in Blatatin village explained that in the 1970s and 1980s, almost 60–75 per cent of household water was harvested from banana trees, while the rest was procured from rainwater harvesting for which women provided the main labour.¹⁶

During the joint workshops held with children and adults, apart from Wolodhesa village, the adults were asked to do a village disaster history exercise, using their personal memory of past disasters. Guided questions were: When did the disaster take place? What types of hazards affected your area? What were the consequences and early indications? What was done and who did what?

Table 14 Age range of participants

Village name	Average age		Oldest participant	
	Adults	Children	Adults	Children
Wolodhesa	49	13	70	15
Mesabewa	39	17	58	19
Dowan	31	11	45	13
Pakis	38	11	90	12

In Mesabewa, adults could remember back to 1956 when floods hit their village and the neighbouring village causing five casualties, ten lost cattle and lots of trees swept away. Other past events mentioned were a typhoon in 1971 and a drought between 1971 and 1973. In Dowan, participants remembered a landslide in 1977 following a week of continuous rainfall. In Pakis, men and women remembered a landslide in 1977 caused by heavy rainfall leading to three casualties. A 90 year old woman recalled that during the Dutch colonial period, many people experienced serious skin

¹⁶ Today, about 50-60 per cent of the average household water budget is met by rainwater harvesting while about 20-30 per cent is met by water trucking, with a price of US\$2 per cubic meter of water. However, the poorest are able to buy water at the rate of ten cents per 20 litres. People in rural areas still harvest water from banana trees for washing dishes thus contributing to 10–20 per cent of household water budget, depending on economic vulnerability. The villages of Mesabewa and Wolodhesa, where our fieldwork was undertaken, used to harvest water from banana trees. Fortunately, with the joint support of local government and NGOs approximately ten years ago, these villages were able to establish other water supplies resulting in greater water security today.

disease, while during the Japanese occupation, many children died of starvation. While the adults seemed to have a limited view of the risks their community faces (or they failed to identify these risks due to other priorities), children seemed more likely to share a broader range of the risks facing their communities. In Dowan, children (girls and boys) developed a more extensive list of disaster risk according to their own understanding as presented in Table 15.¹⁷

The children were more proactive than their parents in remembering events that had taken place during their lifetime. Boys and girls mentioned *lindu*, a small earthquake, that often took place in their village, but which wasn't mentioned by the adults. Children also said that electrical short circuits have caused fires in individual houses. Indeed, the district's disaster management authority had recently developed Standard Operational Procedures for fire management in response to the high incidents of settlement fires in the district.

This finding supports the need for capacity building for child-centred DRR by NGOs such as Plan. It also highlights the need for revised strategies to ensure inter-generational sharing and learning contributes to building community resilience.

Table 15 Types of risk identified by girls and boys (Pakis village)

No	Identified risks in the village	
	Boys	Girls
1	Earthquake	Drought
2	Typhoon	Earthquake
3	Flood	Flood
4	Landslide	Landslide
5	Forest fire	Stone mining
6	Drought	Deforestations
7	Spiritual Possession	Heavy rain for two hours
8	Madness (see Section 5.8)	Electrical short circuit
9	Electrical short circuit	Harvest failure
10	Human diseases (TB, influenza, typhoid, diabetes mellitus, worms)	

The influence of religion

In Sikka, local communities are used to two different administration systems – the formal government structure and that of the Catholic Church. So too, Rembang has a formal government structure and Islamic organisations. In Rembang and Sikka early childhood education is conducted by the family and is strongly influenced by religious teaching. This means that religion and local culture have a strong influence on teaching relating to disaster events. We are aware of the long-held debates within Islam and Christianity concerning the 'problem of evil' in the face of disasters. The existence, or not, of intrinsic evil is a core philosophical question for religion and while this lies outside the parameters of this research, we acknowledge the influence of the religious paradigm that children follow and use in coping with risk.

¹⁷ Table 15 is a short version based on the top 10 rankings; the original list contained more than 15 types of threats.

Many of the children involved in Plan's DRR programmes had begun to develop a more critical view of disasters. For example, a group of boys in Dowan discussed how earthquakes are the result of the moving of tectonic plates and a group of girls in Dowan noted that water shortages can also be due to human misuse and not simply low rainfall.

The easiest way to link the influence of religion to perceptions of risk is to look at the answers to the causality of hazards and disasters. We were surprised that in all four villages, very few adults associated climatic and geological hazards with divine intervention. Adults in Sikka argued very strongly that their vulnerability to typhoon was due to the elimination of natural wind breaks (trees).

A minority of school children held the view that geological hazards, such as earthquakes, either came from God or were due to sinful activities. In Wolodhesa, only one girl related earthquakes to wrong-doing. In Dowan (Rembang) a few boys related typhoons to destiny as the work of nature, while a few girls related it to climate change. 'Earthquakes are due to 'wrong deeds' and we should repent', said a girl from Wolodhesa village.

In Sikka and Rembang, it appears that communities had made a shift from seeing disasters as 'acts of God' towards seeing the government and the community as responsible for producing and reducing risk. This could be a partial indication of the success of CSO interventions, such as Plan, in transforming perception. However, since we didn't have a control, we cannot unequivocally conclude this to be the case.

In Sikka, girls and boys felt the head of the local church had the most influence in their villages, followed by the village head. In contrast to Rembang, the village head is the most powerful agent followed by external agency interventions such as Plan's child centred DRR project and a World Bank supported project¹⁸. Religious leaders (such as Quran teachers) were perceived to have moderate power.

Adults in Sikka did not share this view with their children. They agreed that the church priest was influential but not the most powerful; nor did he have the most positive influence on their lives. A women's group in Dowan even argued that the Healthcare Centre had the second most positive influence on their villages after the head of the village. This was also the case in Wolodhesa.

Women participants in Sikka (for both Mesabewa and Wolodhesa) argued that the church has a greater influence on their community than the head of the village. The elementary schools in the selected villages are partly owned by religious institutions. Stakeholder mapping exercises in Wolodhesa and Masabewa (Sikka) revealed that although women, boys and girls think that religious organisations are powerful they don't always believe their influence to be beneficial; in some cases they think they contribute to the household burden.

Climate change adaptation

In assessing children's knowledge on climate change, we found that the children over 15 (senior high school students) are well aware of climate change issues as they had studied them as a minor subject in Geography. This was clearly the case in Mesabewa village. In addition, many of the adults reported that the climate had changed in their villages (it was now wetter, drier and windier). Although the decision-makers interviewed could discuss climate change, they had a limited understanding of what the impacts might be in their region and did not have an adaptation strategy in place. Nor were there plans to develop one (this is also true in many developed countries).

¹⁸ The PNPM project (National Programme of Community Empowerment) is a nation-wide village-based World Bank-funded project.

We also noted that the children seemed to have gained additional knowledge through the CSO child-centred DRR programmes that promote climate change adaptation. Many children were also highly aware of their role in forest conservation and in the mitigation of climate change impacts through everyday activities.

Despite the fact that local communities (children and adults) were aware of changes in local climate, local government framing of the problem was less evident. Our interview at the Development Planning Agency (Bappeda) office in Sikka revealed that the district official is aware of issues such as greater uncertainty in climate prediction, yet an adaptation agenda was absent. One of the reasons given for this is 'because people here haven't yet seen a great impact of climate change on their livelihoods. Every time we go to a community we just ask them to prepare their seeds but we never discuss comprehensively with them the impact of climate change on their lives.'¹⁹

Rembang is prone to climate-related hazards such as flood, drought, forest fire and storm surge. Four out of five of the district government's top high profile hazards in Rembang are climate related. However, formal responses, as indicated through interviews and copies of documents, show that the local government focuses more on disaster preparedness and response interventions – such as drafting and endorsement of the Standard Operational Procedures (SOP) for emergency management through their emergency budget.

Increase in communities' exposure to risks

During interviews with village heads, as in Wolodhesa²⁰, we were informed of rapid demographic changes and development in the villages. The opening of a new road to the villages along with the availability of chainsaws and the demand for timber had caused a dramatic increase in tree clearance. The construction of concrete homes had also increased in recent years: 'In the 1970s there were no concrete houses and in the 1980s there were only four concrete houses. But now there are more and the houses are better', said Mr. Markus Mello from Wolodhesa village.

A local mason mentioned the Flores earthquake in 1992 (magnitude of 7.8) that caused 100 deaths and heavy damage within the village, especially to the newer concrete houses that lacked adequately reinforcing. Today, according to the mason, when people reconstruct their houses only the wealthy can afford reinforced concrete material. However, earthquakes are not considered a major risk.

The village head in Wolodhesa stated that agriculture has diversified and more commodities are grown today than in 1970s, when people only grew candlenut. Today they grow candlenut, cocoa, cashew and coffee. However, due to the growing population, farms are getting smaller and soils nutrients are depleted and heavier use of chemical fertilisers are needed. The interplay of land degradation and population pressure seems to drive massive migration outside the village.

'The population density in this village was high before. But since the 1980s and 1990s many people have migrated to other areas such as to Kalimantan, Malaysia and Batam. Recently many young girls go as workers in Singapore, Hong Kong and Malaysia. Only about ten percent of young people stay in the village. The number of people in this village decreases yearly not because of death but migration', says Mr. Markus Mello from Wolodhesa village.

¹⁹ Interview with Bappeda Sikka Office with the head and staff of the Social Cultural Unit, 17 October 2008.

²⁰ Interview with Mr. Markus Melo, 16 October 2008.

We were not able to confirm the claim that only about ten per cent of young people stay in the village. This outmigration is not unique to this village, however. While one reason is education, the vast majority of outmigration is due to job-seeking beyond Flores in several domestic and international destinations such as Hong Kong and Malaysia. At the larger scale, several districts in Flores Island have become heavily reliant on remittances over the last 20 years. One implication for children is that parenting roles have shifted towards grandparents thus creating a greater gap in intergenerational dialogue. This was partly reflected by workshop participants who attended on behalf of their grandchildren's parents. Unfortunately, no quantitative data on the numbers or gendered composition of outmigration were available. The scale of outmigration is not fully understood by the local elites. One local leader stated accusingly: 'the locals are too lazy to utilise their land'.

Policy Spaces for CC DRR/CCA

The Indonesian disaster risk management system is presently in a period of transition. National legislative reforms have led to the creation of a new disaster management act (DM Act), which provides for the establishment of a National Agency for Disaster Management (BNBP) to replace the National Coordination Body for Disaster Management and Internally Displaced Persons (IDPs the so-called Bakornas). According to Pujiono (2005), the legislative reform aimed to engender a more proactive approach to disaster risk reduction, marking a shift from a previous focus on emergency response and recovery.

The national DRR policy reform in the form of National Disaster Management Law in 2007 is seen as a first step. Several first steps at the local level are still needed. As of May 2009, legislative reform for disaster management took place in no more than two out of 33 provinces and no more than three out of 500 districts. Due to high demands and public calls to have local level disaster policies and regulations, there are risks of undermining governance principles such as deliberativeness, participation, legitimacy, accountability and lack of inclusive governance in the process of local level reform. Included in this concern is the need for children to participate within the local disaster risk bills.

Due to decentralisation in Indonesia, national governance has changed dramatically. More than 220 new regencies or cities (municipalities) had been created by June 2009. So that disaster reduction can be effectively implemented, disaster policy reform process should also be taking place in cities and regencies and at a provincial level. The expected domain of reform process, in theory, should be at local legislative and executive level.

Results from field interviews in both Sikka and Rembang showed that most disaster risk management leaders at the district level were unaware of DM legislative reforms at the national or provincial levels. Information gaps, especially concerning upper level policy, exist both in Sikka and Rembang. In both districts, the disaster management focal points were not fully aware of the upper level reform such as requirements to integrate disaster risk reduction into their development programmes, and to allocate an adequate disaster management budget within their annual development budget. Despite the fact that Rembang had already produced at least nine standard operational procedures (SOPs) for 14 different hazards such as flood and tsunami, the disaster management policies maintain a strong focus on disaster preparedness and lack a vision in terms of disaster risk reduction initiatives.

It is clear that the concept of disaster risk reduction continues to be confused with preparedness, response and recovery activities. This was also apparent in the views held by some Plan staff. On a more positive note, one government official interviewed stated that it was Plan who had introduced the concept of DRR to them, highlighting the importance of the role of CSOs in capacity building and advocacy at the local level.

'We don't have planning for pre-disaster. Honestly, it's a new idea for us. We just concentrate on emergency response. Plan is the one that brought the idea of DRR to us when we attended a workshop they organised in Wailiti', said a Development Planning Board Officer in Sikka.

Within the new DM Act, children are explicitly recognised as a vulnerable group. Article 55 states that 'vulnerable groups will be prioritised in terms of rescue, evacuation, security, health services and psychosocial (services)'. It further notes, 'Vulnerable groups comprise: infants, under five children and children'. It is clear from the DM Act and from the views expressed by those interviewed that children are considered to be especially vulnerable to disaster risks²¹. However, they are not seen to have any capacity to actively reduce disaster risks and instead are viewed as passive victims. Our field work shows that children themselves are aware of their roles as risk producers and also risk reducers in their everyday lives.

The required process at a national level concerning the inclusion of boys and girls in DRR/CCA should aim to provide opportunities for them to voice their concerns. Even though the highest product of DRR policy reform at national level did not recognise the potential roles of children, national level advocacy should routinely ensure that the drafting of DRR bills in 500 districts and municipalities and 33 provinces includes the rights of child participation in local disaster planning.

²¹ The term 'children' appears only twice i.e. in the Article 55, verse 2 regarding children under five and children as vulnerable groups.

6.0 Discussion and conclusion

In order to make the world a safer place for children and youth it is imperative that their concerns and expectations are included in all levels of decision making for disaster risk reduction. It is also important to recognise the barriers and constraints to Child-centred DRR of socio-cultural, economic, political and physical factors.

The protagonist view argues that children are not passive victims of disasters who merely need to be protected through formal and informal risk reduction policy. In villages, where there are interventions through school-based or informal disaster risk education programmes, we found that children adopt more active roles as agents for risk reduction in their homes and villages. Workshops in the four selected villages provided evidence that the selected children were able to express their views on their capacity and limitations. In addition, based on the contextual experience in Sikka and Rembang, we found that children are potential risk communicators whose risk perception, priorities and risk experiences may be different to those of adults.

Interestingly, the selected children are also aware of their roles as risk producers, for example they are aware of their role in clearing land and removing trees for firewood which contributes to landslides or littering leading to blocked drains and more flooding. During the workshops, the children were able to identify the importance of protecting trees to mitigate against flood and landslides.

A key constraint to child-centred DRR/CCA in Indonesia is the argument that 'children are too small to deal with disaster risks'. This view was repeatedly shared by adults and even by some of the children. Within Indonesia children are generally considered to be vulnerable and incapable of reducing risks or playing an important role in community life.

The answer 'to what extent can boys and girls reduce their risk and vulnerability using their experience, knowledge and capacity?' depends on the willingness of adults to share their decision-making power with children. A 'minimum standard' of child participation at the local and national context would not only promote children's dignity, but ensure that children's concerns are included in the decision-making. The participation of girls and boys in the community risk assessments carried out in our workshops demonstrated that the inclusion of their concerns, knowledge and aspirations greatly increased the quality of the process. During our workshops in Pakis village in Rembang, children were asked to peer review the risks identified by their parents and village leaders. They identified that the adults had overlooked many existing risks within the village. This supports the benefits of child participation for effective and comprehensive risk reduction.

Differences in risk perceptions (causes, consequences, solutions to reduce risks) were also noted between men, women and the decision makers. However, most striking was the widely held belief that the views and abilities of girls and women are subordinate to men's. When asked the question 'are girls or boys more capable of reducing risks in their community', the boys and girls (with an exception of a few girls), adult males and females positioned girls as having a lower influence and capacity to reduce risks than boys. Within Indonesia, public decision-making is generally the domain of men. Even in the best known matrilineal culture in West Sumatra, where property inheritance follows the female line and husbands are 'guests' in their wives homes, decisions are still made by male representatives of the family (Blackburn 2004:8). Blackburn states

that the influence of world religions, most notably Islam, has overridden earlier, and often less restrictive, notions of gender. It is important to note however, that males were perceived as more capable actors in reducing risks in both the Islamic and Christian communities visited. Rembang has a national reputation as the centre of women's emancipation, represented by the first movement in 1912 where Kartini, 'the crusader for personal liberty, for the rights of women and children' (Taylor 1989: 297), symbolised the struggle fighting for women and children's rights to education (Kartini and Taylor 1974). Today, the gendered division of roles in the patriarchal paradigm poses a significant barrier to Plan's Child-centred DRR programme.

In a recent newspaper article Madung²² argues that Indonesia's public space is flooded by religious activities. The first of the five principles, which forms the philosophical basis of the Indonesian State (Pancasila), affirms 'belief in the one and only God'. There is a Ministry of Religious Affairs within the national cabinet and religious institutions are highly regarded at all levels. As noted by Winchester (2003), it is likely that the misery and devastation caused by the eruption of Krakatoa in 1883 and the associated tsunami aided the rise of the Banten Peasant's revolt. This uprising was backed by Islamic teachers (and hajjis) who stated that the volcanic disaster was a divine punishment for the colonial government and the local people who served the non-believer government (Winchester 2003: 334–445). Even in recent times numerous references from both Christians and Muslims can be found which align any number of natural disasters to acts of divine punishment. Following the 30 September 2009 earthquake in West Sumatra and Jambi Province, which killed over one thousand people and resulted in 114,797 collapsed and 67,198 severely damaged buildings, Indonesia's Communication and Information Minister declared that the spate of recent disasters was caused by people's immorality. Statements such as these absolve authorities from responsibility and shift blame to the victims.

However, despite the significant influence of religion in Indonesia only a minority of the children and adults involved in this study (from all four villages) associated any climatic and geological hazards with divine intervention. In Sikka and Rembang, participants did not see disasters as 'acts of God' but instead stated that the government and the community are responsible for reducing risk. It is likely that this is the result of education and capacity building interventions for risk reduction from Plan and other CSOs. However, further research is needed with control groups who have not been involved in a DRR programme and a wider research sample before strong conclusions can be drawn.

We support the protagonist view of children in disaster risk reduction. Children and young people are not passive victims and have an important role to play in communicating risks and in preventing and responding to disasters (Mitchell et al 2008; Anderson 2005: 168). In addition they have time and capacities which adults may not (Kruger and Chawla 2005). Our research validates other findings from the Philippines and El Salvador which has identified that children are well placed to carry out DRR activities and play an advocacy role within their communities.

The everyday mainstreaming of child participation in disaster risk reduction is not a simple task. An enabling environment for child participation in DRR/CCA means that committed agencies need to address not only the root causes of child vulnerability but also overturn long held cultural norms concerning gender and the social construction of children as powerless agents. This requires strong advocacy for the formal inclusion of children in DRR policy making in local district bills (already missing from the National Disaster Management Act) including making child participation imperative within village decision-making processes.

²² Media towards the future – Religion and Public Space by Otto Gusti Madung, published in Pos Kupang Monday 30 November 2009. <http://doingkoe.blogspot.com/2009/12/agama-dan-ruang-publik.html>.

To make matters more difficult, we identified a significant lack of information and knowledge about the new disaster management legislative reforms amongst decision-makers in both Rembang and Sikka. Unfortunately, it is likely that the institutionalisation of risk reduction into formal local government structures will take longer than expected. In addition, most institutions and formal organisations see children as vulnerable and incapable of dealing with disaster risks thereby creating significant barriers to Plan's Child-centred DRR programme. Messages from the field in countries such as Indonesia indicate that even under the auspices of the Hyogo Framework for Action (HFA) which makes specific references to children²³, this vulnerable group continue to be marginalised by the adult institutions dealing with disaster risk. If NGOs are serious about Child-centred DRR then they must take on an advocacy role to create policy spaces which will both facilitate and enable Child-centred DRR.

²³ Plan International's five-year multi-country programme of action research on child-centred DRR, based on the five priorities of the Hyogo Framework of Action (HFA) is aimed at (with subject to context and capacity): (1) promoting and supporting children's rights as a fundamental part of making DRR a national and a local priority with a strong institutional basis for implementation (2) Involving children and young people in identifying, assessing and monitoring disaster risks and enhancing early warning. (3) Using knowledge, innovation and education to build a culture of safety and resilience at all levels including children (4) Involving children and young people in reducing the underlying risk factors. (5) Strengthening disaster preparedness for effective response at all levels, particularly at the community level, concentrating on children and young people.

7.0 Further research

It is widely believed that children will take risk messages home to their parents and siblings and also spread these messages amongst peers within their community. However, very little research has been conducted to determine the effectiveness of these informal communication networks. Anecdotal evidence gathered during our research suggests that these household communication pathways are limited. As such, we recommend that child centred agencies like Plan ensure parents, siblings and interested community members are sensitised in the child-centred DRR programme, so that they are also in a position to benefit from DRR capacity building and contribute to building community resilience. In addition, children participating in DRR programmes should be encouraged to carry out activities which involve their family and the wider community – carry out a risk assessment of their home, interview their parents or community leaders on historical disasters and so on. This can support greater intergenerational learning and ensure the transfer of indigenous knowledge. It is also hoped that further funding will be secured in order to investigate in more detail informal communication networks within the family and wider community.

The research links formed and the momentum gained with children, adults and staff in the field sites during this short two week research study proved extremely valuable and constructive in developing a better understanding of the role of culture and gender in child-centred DRR. In order to build on this, further action research was conducted in these communities to explore the use of participatory videos (PV) as an innovative tool for child centred DRR/CCA work. The project trialled the use of participatory video as a means of facilitating communication between children and decision-makers in order to establish greater local accountability and action on DRR and CCA. Fieldwork took place in Indonesia and also in the Philippines. The project began in January 2009 and ran for 12 months. It was implemented by researchers and practitioners from Risk Frontiers Macquarie University, Australia; Plan UK, Plan Indonesia and Plan Philippines.

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Notes

