Abstract. This article investigates the implementation of disaster risk reduction education for children in Indonesia. In the last decade, education programs related to this subject have been promoted as capable of reducing disaster losses and increasing resilience, based on several studies that have identified positive outcomes. However, most of these studies were undertaken in developed countries. The article uses a case study in Jakarta, a rapidly growing megacity that is highly prone to disasters and natural hazards, especially floods and fires, to explore the scaling-up and sustainability of disaster risk reduction in Indonesian schools. Based on previous studies, a new approach was developed for evaluating the implementation of education programs related to these subjects. This study captured the perspectives of children, school personnel, and non-governmental organisations on the challenges of scaling-up the implementation of disaster risk reduction education in schools. The study revealed seven key issues and suggests several policy recommendations to move forward. These key issues may also be apparent in many other developing and developed countries, and the suggested recommendations may well be applicable beyond Indonesia.

1 Introduction

Children, defined by the United Nations (1989) as anyone below the age of 18 years, make up nearly one-third of the world's population (UNICEF, 2014). This represents a significant increase: just20 years ago, children made up less than a quarter of the world's population (UNICEF, 1996). Children are considered one of the most at-risk groups in a disaster. WHO (2011) estimates that 30-50% of fatalities arising from natural hazard events are children. Children are more likely to be injured, have lessaccess critical humanitarian assistance such as food and health care and are exposed to other dangers, including separation from their families or caregivers (Peek, 2008). In the aftermath of a disaster, children can develop symptoms of Post-Traumatic Stress Disorder (PTSD), depression, anxiety, emotional distress, sleep disorders, somatic complaints and behavioural problems (Masten et al., 2015; Newman et al., 2014; Norris et al., 2002).

Education is a key mechanism through which children can participate in Disaster Risk Reduction (DRR) (Amri, 2015). There is growing anecdotal evidence that when children are supported by adults and are provided with sufficient knowledge and skills, they can protect themselves, save others from danger, and

promote significant changes in their communities to adapt to climate change and reduce the risk of disasters (Back et al., 2009; Haynes and Tanner, 2015; Mitchell et al., 2008; Tanner, 2010; Webb and Ronan, 2014; Wisner, 2006). Recent empirical research has provided further support children's agency in this realm (Haynes and Tanner, 2015; Towers, 2015).

5 Education has always been one of the priorities in the global commitment for DRR, as articulated in the Yokohama Strategy (United Nations, 1994), the Hyogo Framework for Action (HFA) 2005-2015 (UNISDR, 2005) and most recently, the Sendai Framework for Disaster Risk Reduction 2015-2030 (UNISDR, 2015b). Substantial efforts have also been made to integrate DRR in the education sector (Ronan, 2014). In the 2013 Global Assessment Report, 72% of reporting countries specified that DRR

10 had been integrated within their national education curriculum (Ronan, 2014).

Concurrently, there has been an increase in research examining DRR education in schools, including documenting positive outcomes. For example, children who have been exposed to a DRR education program have better knowledge, reduced levels of hazard-related fears, and more accurate risk-perceptions (Ronan et al., 2010; Ronan and Johnston, 2003; Ronan et al., 2001). However, the majority

15 of published studies on DRR education are based in developed countries, tend to rely on quantitative methods and are mainly limited to involving students and teachers (Amri, 2015).

The UNISDR (2009) defines DRR as a comprehensive and systematic approach to analysing and managing the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved

20 preparedness for adverse events. This article captures the first phase of larger programmatic research and is focused on several components of DRR (i.e. preparedness and response capacity). This approach was taken based on previous DRR education studies (e.g. Johnson et al., 2014; Ronan et al., 2010; Webb and Ronan, 2014) that focused on preparedness and response. In addition, the Indonesian Government has been emphasising these components with respect to DRR education (BNPB, 2012).

25 Given the limited research on DRR education in developing countries, this study aimed to identify challenges associated with implementing DRR education in Indonesian schools. Several studies have shown that awareness and knowledge of the Indonesian public about DRR is still low and requires improvement (refs). This includes teachers and students as well as at household level (BNPB, 2009;

Desfandi, 2014; Sopaheluwakan et al., 2006). In these studies, access to DRR education materials, more preparedness planning at the household and community level, and support from relevant agencies were identified as key issues.

The government of Indonesia has made substantial gains in the integration of DRR into the education sector, including integrating DRR within school curricula and providing teachers with training on DRR education and school preparedness (BNPB, 2014b; UNISDR, 2015a). However, there continue to be challenges with sustainability and scaling-up of programs. Alongside outcome effectiveness, sustainability and scaling-up are the main issues related to DRR implementation within the school curricula internationally (Ronan, 2014). Despite this, no published research assessing challenges associated with the implementation of DRR within the school curricula has been conducted within the Indonesian context.

1.1 Starting point of the study

In order to identify the key challenges on the implementation of DRR education in Indonesia, this research builds on an initial study undertaken by Johnson et al. (2014, hereafter referred as the Johnson study). Based on focus group discussions (FGD) with New Zealand teachers, the Johnson study identified eight facilitators and eight deterrents that influence the use of DRR education material in "What's the Plan, Stan?", a national education program developed by the New Zealand Ministry of Civil Defence (Table 1. Classroom and school-wide facilitators and deterrents to use of "What's the Plan, Stan?" (Johnson et al., 2014)

Facilitators	Deterrents
School-wide use of the resource	Voluntary nature
Promotion of the resource by teachers	Lack of awareness of the DRR education resource
Direct engagement with local Civil Defence and Emergency Management staff	Perception that training is needed for its use
	Lack of school-wide use
Teacher's interest in the subject	Lack of relevancy when no disaster occurred
Student's interest in the subject	Incompatibility with teaching methods
Good-quality design	Competing extracurricular topics
Recent disaster	Lack of direct engagement with local CDEM staff
Teachers' training	

In addition to a focus on the views of school personnel, as in the Johnson study, this study captured the perspectives of children and non-governmental organisations (NGOs). Based on a literature review by

Amri (2015), the role and views of other stakeholders are considered important, particularly NGO-based DRR professionals, as they are the main drivers for advocating and facilitating DRR in many developing countries, including Indonesia.

Thus, this study was designed to gather data that can help improve the implementation of DRR education within the Indonesian education sector. The following section provides a description of the case study location.

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1.2 Case study location: Jakarta, Indonesia

Jakarta was selected as the study location (Figure 1) due to a combination of rapid economic growth and urbanisation (Statistics Indonesia or BPS, 2015), a high level of urban poor living in high risk areas

(Baker, 2012) and a high prevalence of both geological and climate-related hazards with high vulnerability (Swiss Re, 2014).

In addition, as in many other developing countries, Jakarta has many active DRR programs implemented by various government agencies and NGOs, including the United Nations (UN), World Bank, Red Cross, Save the Children, Child Fund, World Vision, Plan International, and Mercy Corps (Brown and Dodman, 2014; UNISDR, 2012; World Bank, 2014a).

From 2002 to 2014, four major floods occurred in Jakarta displacing close to one million people (BNPB, 2014a). Major floods occur if heavy rainfall coincides with an extreme high tide (Sagala et al., 2013). As a result, children and schools are often significantly affected. For example, a post-disaster assessment of the 2013 flood reported that more than 70,000 students from 251 primary schools in Jakarta could not access their school for three to four weeks due to flooding (Education Cluster, 2013).

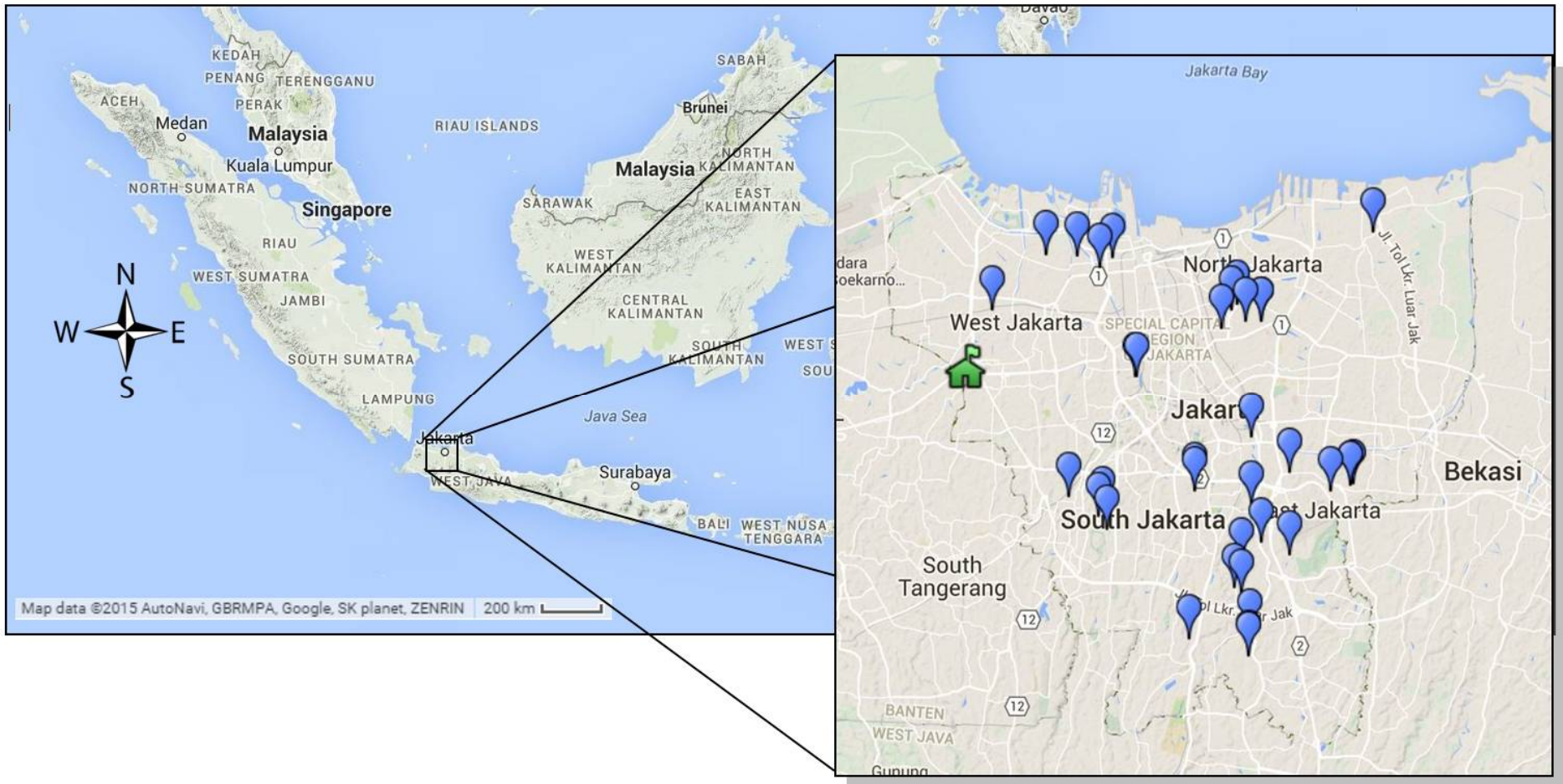
Jakarta is also prone to fire hazards. From 2009 to 2013, fire incidences in Jakarta led to 141 deaths. Fire fatalities were three times more than those caused by floods in the same period, which totalled 43 (BNPB, 2014a; BPS, 2015).

1.3 Basic education in Indonesia

The Indonesian education system is the fourth largest in the world (World Bank, 2014b). There are more than 50 million students and almost 4 million teachers in more than 269,000 schools spread over 17,000 islands (Chang et al., 2013; Ministry of Education and Culture, 2012; World Bank, 2014b). More than 80% of schools are public (OECD/Asian Development Bank, 2015).

Since 2003, Indonesian schools have the authority to manage their operations independently with involvement from the local community as part of the school committee (Vernez et al., 2012). Schools also have the autonomy to develop the syllabus, learning materials, and operationalise the curriculum based on the guidelines provided by the Curriculum Centre, a unit under the Ministry of National Education. In 2005, the Government of Indonesia enacted a new law that aims to improve the quality of teachers by providing mandatory certifications through courses and professional development (Chang et al., 2013).

5   Starting from 2009, the Indonesian Government has piloted a DRR schools project originally named "Disaster Prepared Schools" (or Sekolah Siaga Bencana in Bahasa) but now called "Disaster Safe Schools" (or Sekolah/ Madrasah Aman Bencana in Bahasa). According to government report from 2013, there are more than 25,000 schools that have implemented the Disaster Safe Schools program supported by government agencies and/ or NGOs (Ministry of Education and Culture, 2015). This report also indicates that the main intervention is focused on non-structural measures; that is, DRR education and the development of school disaster management plans. Schools participating in the program are typically selected based on the recommendations of the local education offices and/ or disaster management offices, based on their exposure and vulnerabilities to disaster hazards.

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

2 Methodology

This study used a multi informant, mixed methods approach, focusing on three distinct groups: primary school personnel (i.e. teachers, school administrator, and school principals), DRR professionals within child-focused NGOs working in Jakarta and children. Individual tools were developed for each stage of the research. These are available from the lead author on request. This study was approved by the Human Research Ethics Committee of Macquarie University (Ref Number: 5201400846).

Using a critical realist approach, the overall analysis applied a thematic focus, stressing the pursuit of a better understanding of the underlying problems (Sayer, 1992). The authors were advancing and testing tools thought to be appropriate for Indonesia but also informed by previous international research, e.g. Johnson et al. (2014). The research was completed between late November 2014 and mid-January 2015. Each stage of the research is discussed in the following sections.

2.1 Primary school personnel questionnaire

A questionnaire was developed for school personnel based on Child-Centred Disaster Risk Reduction (CCDRR) theory and research, including findings from previous studies that were adjusted for the Indonesian context (see supplementary material). The questions were framed and based around globally recognized frameworks such as UN Conventions for the Rights of Children (1989), Hyogo Framework for Action (2005), and Comprehensive School Safety Framework (2014). A similar approach was used in designing the children's questionnaire.

Five parameters that dealt specifically with the issue of DRR education were selected for analysis in this study: 1) child participation in DRR, 2) DRR related activities in schools, 3) involvement of external stakeholders, 4) DRR education facilitators and deterrents and 5) teachers' training in DRR.

Two questions related to facilitating and deterring factors of DRR education are central to this study. These factors included the eight deterrents and eight facilitators identified from the Johnson et al. (2014a) study. Three deterrents and four facilitators were added in consideration of the Indonesian context (Table 2), to assess:

- teachers' capacity for infusing DRR into the existing curriculum,

- the role of the community in influencing DRR education in schools,

- issues relating to the availability of resources, e.g. funding and dedicated personnel, and

- whether or not school personnel are aware of current policy.

Table 2. Modified facilitators and deterrent for teachers to implement DRR education

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

The questionnaire was reviewed with several academic colleagues expert in this field.

The self-completed questionnaire was distributed at the end of a training session organised by the Jakarta Provincial Disaster Management Agency (BPBD) and the Consortium for Disaster Education (CDE). The training was a focused session for personnel working in flood prone primary schools in the Jakarta area

10 to learn more about appropriate emergency response measures for their schools. While the training did not cover DRR education per se, the session was considered a good opportunity to target a large group of

tschool personnel who not only worked at high-risk schools but would also have an increased awareness of the risks they faced and disaster-related terminologies and approaches, including DRR education.

All participants at the training session agreed to take part in the survey. An explanation of the nature of the research, including its purpose and ethics approval, was provided. Participants completed the questionnaire in the same setting. However, they did not discuss their responses with each other.

A total of 44 members of staff from 39 flood prone Jakarta primary schools completed the questionnaire (Figure 1). They were from schools ranging in size from from 107 to 500 students with an average of 273 students per school and included seven school principals, 34 teachers, and one administrator. Two people did not state their positions. Participants included 22 females and 22 males, whose age ranged from 22 to 59 years ($M = 43.71, SD = 11.23$).

Descriptive statistics in Microsoft Excel were used to analyse the data.

2.2 Focus group discussion with NGOs

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

Two other organisations (Indonesia Red Cross and Child Fund International) were also invited to participate. However, one agency did not respond to the invitation and the other was unable to attend due to unforeseen circumstances.

Five people (three males and two females), one from each organisation, participated, which is considered an ideal number for FGD on non-commercial topics (Krueger and Casey, 2015). The small size allowed time for in-depth discussions and clarifications. The participants were middle to senior level staff with more than seven years of experience implementing DRR projects in Indonesia.

The aim of the FDG was to strengthen and triangulate data on the barriers and challenges in implementing DRR education as identified through the school personnel questionnaire. A series of discussion topics was developed based on the findings of the Primary school personnel questionnaire and also the lead author's experience of working as an NGO and CCDRR practitioner. However, as is best practice with

in-depth qualitative research, it was also the intention for participants to discuss other topics they felt were important to ensure coverage of a wide range of issues related to CCDRR (Kitzinger, 1995). Topics explored in the FDG included: participants' views of their agencies experiences and understanding of CCDRR; the successes, barriers and challenges to implementation, sustainability and scaling-up; strategies used to overcome barriers and challenges; and, other issues linked to sustainability and scaling-up.

FGD participants were briefed on the nature of the research, including its purpose and ethicmeasures approval. Participants were also asked for their permission to be audio recorded.

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

The FGD was held in a UN meeting room that is a "neutral" and familiar space for the participants. All participants were active in the FGD and shared their own perspectives and experiences. The discussion lasted for 1 hour and 40 minutes.

The audio recording was transcribed verbatim and the transcripts analysed with the use of the qualitative data analysis software, QSR NVivo 10® using a thematic and inductive approach.

2.2 Student questionnaire

The questionnaire for students was designed to assess children's interest and knowledge on DRR. It comprised 40 items drawn from previous research and theory and included questions to ascertain demographic information, DRR-related awareness, risk perceptions, emotions, and attitudes about DRR, participation in school- and home-based preparedness for hazards and a knowledge test (see supplementary material). The knowledge test questions related to fire prevention and safety, flood

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

5   The student questionnaire was administered to 140 students in Grades 4 and 5 in Kembangan Selatan 2 Pagi Public Primary School. The age of students ranged between 9 and 12 years, with the exception of one student who was 14 years of age (*M = 10.48, SD = 0.76, comprised of 73 girls and 67 boys*). Children of these age groups were selected because they have sufficient communication abilities to respond to simple inquiries (Bell, 2007; Borgers et al., 2000).

10   This school was selected because the school principal had taken part in the school personnel questionnaire. Thus, initial rapport was built and permission granted for this research to be conducted with the students. Furthermore, the school for this study is part of the government endorsed Safe School program supported by a local NGO, and is an at-risk school for annual flooding. In early 2014, there were two occasions where the floodwater reached one metre in depth, forcing the school to be closed for a

15   week on both occasions.

At the time of the study, there were 408 students (204 girls and 204 boys), ranging from 6 to 15 years old, enrolled at the school with one school principal (female), 22 teachers (11 female and 11 male) and two personnel as school guards (all male).

Options of "I'm not sure", "I don't know", and "Other, please specify" were provided to reduce pressure

20   and avoid participants answering randomly, as with the primary school personnel questionnaire,

The student questionnaire was reviewed by several academic experts who have experience in developing and validating questionnaires. It was also pilot-tested with 182 children in five schools in North Jakarta as part of a baseline study conducted by Save the Children (2014).

The pilot survey showed that some children were having difficulties writing responses in open-ended

25   questions and also that their concentration was reduced if the process took over an hour. Therefore, the number of open-ended questions was minimised and the total questions restricted to shorten the process. The final questionnaire had 40 items. Considering the changes made to the questionnaire, the results of the pilot survey are not included in the analysis presented here.

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

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

The whole process was supervised by a teacher. During the process, discussion about question clarification was encouraged. However, no discussion or deliberation between students about their answers occurred. Data was entered and analysed using Microsoft Excel.

Scoring criteria was developed to classify participants according to the level of knowledge into the following groups: high, medium and low (Table 3). For example, participants who selected three correct answers (out of 5 questions) in relation to hygiene were rated as having a medium level of knowledge. This classification was used to differentiate children with a high level of knowledge in DRR and others who require more learning.

Table 3. Criteria for classifying children's knowledge and skills

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

3 Results

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

3.1 Questionnaire: School personnel

3.1.1. Children's involvement in DRR

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

However, when it comes to children's participation, the views of teachers are divided, with 45% considering that this might increase the risks faced by children and 39% believing that children should not be *actively* involved.

3.1.2. Factors in implementing DRR education

Eight facilitators and five deterrents (shown in italics in Table 4) were selected by more than one-third of participants. Hence, these are considered as key factors. Moreover, two-thirds of participants (69%) selected more than one option. While inspection of Table 4 underscores this point, a few factors stand out as more important, with the highest response being teachers training availability.

3.1.3. Preferences on type of teachers' training

When asked if they were interested in training if it was offered and didn't impinge unduly on their time, all participants answered yes (100%). A blended or combination approach involving a mixture of classroom (theoretical approach) and experiential training received the highest endorsements (50% of 44 responses), with "experiential or hands-on" training receiving the highest score for a single method (38%).

3.1.4. Partnerships with other stakeholders

More than one-third of the participants (37%) think that the level of coordination between their schools, the local council and the disaster management agency is non-existent to low, 36% believe there is a medium level of coordination, and 25% stated that the coordination level is high. However, 75% of participants indicated that they desired future changes to the level of coordination between these

stakeholders whereas 18% did not. The remaining participants did not answer the question. Of those who answered yes, two-thirds provided reasons of which, 45% were related to improvement in disaster response and 32% in relation to disaster preparedness.

3.2 Questionnaire: Children

5 **3.2.1. Perspectives of children of their knowledge - what they think they know as opposed to what they actually know**

Most children correctly identified the hazards that may impact their homes (79%, n=140) and their school (62%), i.e. earthquake, floods, strong wind, structural fires, high tide, disease outbreak, riot, conflict, or violence (as per Dickson et al., 2012; Tadjoeddin, 1990; WHO, 2005). The remaining proportion of 10 children identified hazards that are not likely to impact their homes or school, i.e. tsunami, landslides, volcanic eruption, drought, or forest fire.

The majority (71%) of children indicated that they think they know how to be safe, 14% do not think they know how to be safe, 14% were not sure and 1% did not answer the question. Nearly all children think that they can or maybe can make themselves (94%) and others (91%) comfortable or calm in an 15 emergency. However, the majority of children (61%) also stated that they are sometimes worried, scared or upset when thinking or talking about disasters.

Table 4. Teachers' responses to facilitators and deterrents in implementing DRR education in their classroom (participants able to select more than one factor)

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

The results of the knowledge test (see methodology for scoring criteria) illustrate that 89% children have a medium level of overall knowledge, scoring best on flood preparedness and safety, where 26% received a high score. However, the children scored poorly on knowledge in other areas, where only 2% and 15% of children received a high score on hygiene behaviour and, fire prevention and safety, respectively.

5   When comparing the knowledge test results of the 71% of children who indicated that they know how to be safe from disasters, nearly all of them (96%) scored in the low-to-medium range of knowledge, with only 4% having knowledge of DRR in the high range.

3.2.2. Participants' interest in DRR education and involvement in preparedness

Nearly all child participants (94%) would like to know more about how to stay safe. The reasons given
10   for wanting more knowledge were grouped into three themes, comprised of to know how to be safe for themselves (e.g. *"Because I want to know how to be safe from disasters"*), to overcome their fears in relation to natural hazard impacts (e.g. *"Because I fear drowning and many diseases"*), and to protect self, other people and the surrounding areas (e.g. *"Because if it* [disaster] *happens, I want to save my family and neighbours"*). Only one participant gave a coherent reason for not answering 'yes' and that
15   was that the child did not want the disaster to happen in the first place.

A large majority of participants (more than 80%) would like to be involved in making their school and home more prepared for disasters. From the participants who answered "No", only a few provided clear reasons, which were: "*I have never experienced disasters*", "*I do not want to be affected by disaster*", "*because mom and dad would not allow me* [to be involved in preparedness activity]", and "*because it*
20   [being involved in preparedness activity] *makes things difficult*".

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

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

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

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

3.3 FGD with child-focussed NGOs

During FGDs, participants shared their CCDRR project experiences, including efforts in promoting DRR education. They also described successes and progress coupled with the challenges they have faced. Based on the discussions, the findings were categorised into four main issues. The following section described each of the main issues.

3.3.1. Program delivery approach

During the discussion on the NGOs' experiences in implementing CCDRR, several main obstacles were identified. The first is that NGOs face a significant challenge to sustain DRR projects when funding ceases. Participants labelled this a "project mentality" problem.

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

The participants mentioned that most international NGOs do not have a long-term office presence at the local (or district) level and, according to participants, lack a strategy or vision to ensure sustainability in the Indonesian context. When the program ends, the office is closed and staff relocated. Participant discussion also confirmed that the current government's monitoring system does not assess implementation or evaluate progress and effectiveness of DRR programs in schools.

3.3.2. Funding limitation for comprehensive package of safe schools program

Participants stated that NGOs usually have limited funding. Hence, efforts are often limited to delivering singular activities versus more comprehensive packages of education and teachers' training. Training and/or emergency drills were highlighted as the common activities facilitated and conducted. These were
5 echoed several times, with the activities being reported to be one-off events, without exception. There were also challenges in implementing a comprehensive approach for school safety:

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

10 When NGOs do succeed in advocating with local government to allocate funding for DRR implementation, the funding is often small, with reports of competing development priorities as one source of this problem:

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

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

However, some participants disagreed in relation to funding issues. One participant mentioned that funding is available, particularly at the national level. As another participant stressed, the issue is not
20 about budget but more a lack of understanding and capacity of government officials associated with engaging and promoting children's participation. Although, one participant pointed out that there are opportunities for funding at the local level by tapping to the village funds.

3.3.3. Political will from the Government

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

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

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

> *"The government does not have a specific focus on children, especially in the disaster sector. Until now, even in emergency response, vulnerable groups have not been the focus."*

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

Nevertheless, moving beyond a project mentality is an issue that all participants want to focus on. Participants emphasised the importance of involving and working alongside government officials. A crucial step for NGOs, to ensure the sustainability of a program and create a sense of ownership, was considered to be establishing relationships with government from early in the development of a project. However, participants noted the challenge in maintaining relationships. This included engaging and building the capacity of selected individuals in an agency as they are commonly transferred (every two to three years) to other agencies in different sectors, thus taking the knowledge and institutional memory of that collaboration with them. To anticipate this, participants recognised the importance of long term implementation planning to secure commitments and anticipate government turnover.

3.3.4. Targeting the right partners

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

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

The participants described that in 2010, the United Nations Development Programme in collaboration with CDE supported advocacy efforts through a project entitled "Safer Community through Disaster Risk

Reduction" (SCDRR). They worked closely with the Curriculum Centre, a unit within the Ministry of Education who hold the authority in designing the national curriculum.

On the other hand, a different set of units, the Primary Education and Secondary Education directorates, oversee the implementation of policies in primary and secondary education. And, these directorates were

5   not involved in the previous stage described, there was thought to be a lack of awareness and low sense of ownership from these directorates to enforce DRR-related policies in the schools, as perceived by FGD participants:

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

10   Participants also acknowledged that there are a lot of actors that should be involved in DRR education, including different units within the Ministry of Education and other agencies (e.g. the National Disaster Management Agency, Ministry of Religious Affairs, and NGOs) who have relevant experiences and interests. Therefore, building inter-agency collaboration and having support from the top level was considered essential. This is a similar approach being undertaken in the water and sanitation sectors in

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

"The Children in a Changing Climate Coalition has already existed for a long time and this is not donor driven, but because we believe that children can be agents of change... Maybe, that is an

20   *interesting idea [establishing coalition at the national level] because there are a lot of players [who have similar interests]."*

4 Discussion

Overall, the results from the survey and FGD have shown the importance of DRR education in schools, based on the perspectives of school personnel, children, and NGOs.

25   The children's survey results suggest that the majority of children: 1) have an awareness of the hazards surrounding them, 2) believe they know how to stay safe from those hazards, and 3) want to be involved. However, nearly all children attained scores within the low-to-medium range on the knowledge test,

scoring poorly on hygiene and fire related topics. And, more importantly, most of these children think that they know enough on how to stay safe from disaster. This is an important finding that suggests children have a lack of knowledge in DRR even though they might have a sense of hazard awareness and believe that they know how to stay safe in a disaster.

5   Having a level of hazard awareness is an important and an initial step to become better prepared (Bird et al., 2009; King, 2000; Paton et al., 2008). However, previous studies have demonstrated that a high level of awareness does not mean that the public have the correct knowledge, are able to practice it when needed, or are necessarily better prepared (e.g. Haynes and Tanner, 2015; Whittaker et al., 2013). This is because there are many other factors at play, not least underlying vulnerabilities. This can be as important

10 as knowledge in influencing behaviour and outcomes in relation to risk reduction (Bird et al., 2011; Haynes et al., 2008; Whittaker et al., 2013).

As evidenced by the results presented here, there are various factors that need to be considered when implementing DRR education in Indonesia. The five deterrents and eight facilitators have been synthesised into six key issues related to the implementation of DRR education in Indonesia (Table 5).

15 Interestingly, children's interest is not considered as a factor of influence. However, the children's survey shows that they have a strong interest to learn about DRR. This is an important issue to keep in mind for schools considering the value of these programs. This has therefore been presented in Table 6 as the seventh factor. Each of these seven key issues is discussed in the following sections.

Table 5. Key issues identified from the facilitators and deterrents, combined with relevant perspectives from teachers, NGOs and recommendations from the Johnson study

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

Table 6. Perspectives on children's participation in DRR

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

4.1 Policy on DRR education in Indonesia

More than half of the school personnel participants think there are no clear mandates and/ or policies on DRR education. This indicates the lack of awareness or clarity on DRR education policies, as Indonesia already has policies supporting for DRR education. The law on disaster management (Act no. 24 of 2007) has provided the legal framework that all citizens have the right to receive DRR education in Indonesia. In 2010, an endorsement letter by the Ministry of Education of Indonesia (2010) (the Circular letter of the Minister of National Education No. 70a/SE/MPN/2010) was sent to all education offices in Indonesia encouraging schools to mainstream DRR education using three options (through existing subjects, local content, and/ or extracurricular activities). In 2012, BNPB also produced guidelines on safe schools. In addition, DRR has been incorporated in the national curriculum from primary to secondary schools, starting from Grade 4 (The Curriculum Centre or Pusat Kurikulum, 2009). The nature of these policies is not imposing but more of encouragement. This is because Indonesia has a decentralised system where the central government has less authority compared to the district government over the education content, financial matters and school practice.

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

appeared to appreciate the development of a national policy but equally lamented that it is not being implemented in a systematic manner. This reflects a more pervasive problem in this area across the HFA with numerous countries developing DRR, or CCDRR, policy that is more "aspirational" than realised (Ronan, 2014).

5   This highlights a failing of the current monitoring system to capture the progress on the implementation of the policies related to DRR education. It is also worth noting that a systematic review of the 35 CCDRR education program evaluations found that none of these were evaluated locally, by DRR professionals, schools, or local community stakeholders (Johnson & Ronan, 2014). All were done by professional evaluators, with over 90% being those in higher academic settings. This is a problem seen in many
10   countries, especially on NGO-led projects, where the HFA has spurred the progress of the implementation of CCDRR education programs and other areas (Ronan, 2014). This state of affairs represents a significant barrier for scaling-up and ensuring sustainability.

4.2 Awareness of and access to DRR education materials

Half the participants from the school personnel survey described that the availability of "ready to go" and
15   "child-friendly" DRR education materials will aid the implementation of DRR education. This suggests that there is a lack of access and awareness to already available DRR materials. For example, the Curriculum Centre (2009) has produced guidelines for teaching on five main hazards (earthquake, floods, landslide, fire, and tsunami) in Indonesia. There are also a variety of guidelines and teaching resources produced by agencies such as the Red Cross (2009) and Save the Children (2007).

20   A further issue is that there are no standards for approved "key DRR messages" in educational resources for the Indonesian context. That is, there is no system in place to control and assure the quality of resources related to child-centred education frameworks, content, and delivery mechanisms in Indonesia, even though it is vital to have standard and/ or consistent key messages (Ronan et al., 2010; Ronan and Johnston, 2003; Ronan et al., 2001; Shimura and Yamagata, 2015; UNESCO, 2014). For examples of key
25   DRR messages see IFRC (2013a).

The current results also demonstrate that school personnel favour the inclusion of innovative methods for delivering DRR education. Practitioners of CCDRR have developed several participatory tools for

children (e.g. risk mapping, transect walks, participatory video, mind mapping) to identify, assess and communicate risks, and generate action to bring about changes in communities (see Haynes and Tanner, 2015; Molina et al., 2009; Plan International, 2010). These tools should be considered for inclusion in the resource materials for DRR education in schools.

5   As a result of current findings, combined with previous research and expert opinion (IFRC, 2013a; UNESCO and UNICEF, 2012; e.g. UNESCO and UNICEF, 2014) it is important that these standard key messages and innovative methods are are included in the new curriculum, when it is rolled-out in 2016.

4.3 Teachers' capacity

A significant percentage of teachers (84%) described a belief that training will help them facilitate the
10   implementation of DRR education in their classroom or school. This percentage is much higher than for other facilitating factors. Some teachers are confident in their abilities to involve children in the disaster preparedness process. However, almost half believe that involving children will put children at greater risk. This is in line with the findings on teacher's perspectives in the aftermath of the 2011 Christchurch earthquake (Johnson and Ronan, 2014).

15   Furthermore, training teachers in DRR poses a significant challenge for Indonesia with more than 17,000 islands and 269,000 schools (Ministry of Education and Culture, 2012) spread in 34 provinces comprised of 413 districts and 98 cities. A cascading method has been used in Indonesia to roll out training for teachers, where Training of Trainers (ToT) is organized and the trainers that have been produced from this ToT continue to train other teachers (UNESCO and UNICEF, 2012). However, this option requires
20   a significant number of master trainers and trainers for teachers. If the target were to train at least one teacher of each Indonesian school, almost 9,000 training sessions would be needed, with a maximum of 30 participants per training. This number excludes training for trainers and associated monitoring components.

A systematic way to improve teacher's capacity is by integrating DRR education in higher education
25   programs for teachers. UNISDR (2008) considers this the most effective, least expensive, long-term and sustainable approach. This way, every teacher will have basic knowledge and skills to teach DRR. Another way is through online or computer-based training, though noting that this was not a preferred

option from the school personnel survey, it has been found effective in reaching a large number of teachers over a short period of time in Turkey (Petal and Sanduvac, 2012).

4.4 Platform for teachers

As it stands currently, the quality of DRR education in schools depends on teacher's willingness and
5   creativity. This is reflected in the survey where personal motivation and promotion of education resources by other teachers are seen to be facilitating factors. Encouragingly, the survey results show that the majority of teachers believe children have an important role in disaster preparedness and that it will bring benefits to children (although noting as well that some teachers think that it may put the children at risk). Johnson and Ronan (2014) revealed that peer-to-peer support among teachers could be an effective
10   mechanism to help teachers implement DRR education. Having teachers that are more knowledgeable and regarded as "champions" on DRR education could inspire other teachers to follow in their footsteps. The Disaster Resilient Australia New Zealand School Education Network (DRANZSEN) is made up of teachers, researchers, emergency service managers and policy makers and is intended to strengthen the relationship and feedback between these spheres and also promote developments in DRR education
15   (Attorney General's Department, 2015). This sort of network serves as an ideal platform with regular face-to-face meetings that could be broadened via an online presence to include Indonesian users. Alternatively, the platform could be replicated to connect teachers involved in DRR education across Indonesia. Creative tools that have been produced such as the ones documented by Back et al. (2009) and Dicky et al. (2015) could also be shared in such a platform.

20   The Indonesian government builds national identity among young people in schools through various approaches. Every Monday morning, all school children have to perform flag raising ceremonies and sing the national anthem and every Friday, all school children undertake morning aerobics with specific choreography that enhances citizenry (Moser, 2015). These approaches, that are repetitive in nature, can also be replicated to instil preparedness and risk reduction knowledge. For example, school principals can
25   disseminate preparedness messages to warn students on the upcoming rainy season during the flag ceremony. Another way to reinforce this linkage is by organising a competition at the national level for the most disaster prepared schools. Studies indicate that friendly competition between schools can

improve the quality of teaching and school performance (Hanushek and Rivkin, 2003; Wößmann, 2007). Similar competitions have been successfully implemented by the health sector, with a government-run "Healthy School" competition held annually at the national level (Direktorat Jendral Pendidikan Dasar, 2015).

4.5 Partnerships between schools and other stakeholders

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

Joint activities can be in the form of developing preparedness planning together, conducting joint simulations, and for school children to raise awareness in the surrounding community. Framed as "being prepared to respond" to appeal to teachers' views could be useful to increase the effectiveness of preparedness measures in schools and the surrounding community (Towers et al., 2014).

Another way to strengthen partnerships is through the local DRR forum, a multi-stakeholders platform serving as a coordination mechanism to enhance collaboration. Schools that have DRR education programs should be part of any local DRR forum to enable dialogue and partnerships with other forum members (e.g. the fire department, Search and Rescue, Red Cross) who have specific skills and expertise related to DRR. These agencies can be invited to share their experiences and also provide trusted and credible information for the students regarding DRR.

4.6 Dedicated personnel and budget

One of the facilitating factors identified is having dedicated personnel and a budget to implement DRR education. However, since DRR is already integrated in the curriculum, there should be no reason for teachers not to implement DRR education, even when there is a lack of dedicated DRR funding.

On the other hand, lack of funding may influence DRR activities beyond simply teaching DRR to students, as suggested by the result from the child-focus NGOs. A comprehensive package of safe schools,

as illustrated by GADRRRES and UNISDR (2014), would require additional funding. This includes other interventions such as retrofitting of school buildings, disaster simulations, teacher training, inviting experts to schools, and developing school disaster management plans.

4.7 Child Participation

5   Students and/ or community interest were factors that had little influence on teachers' views on the facilitators and deterrents in DRR education. This indicates that teachers seem to be indifferent to the interest (or lack of interest) from the students and/ or the community on DRR education. This could be because there is more pressure making sure that students can perform on exams or other reasons. However, this requires further investigation. This perhaps illustrates a style of teaching which may be

10   dominated by a "top down" approach, resulting in reduced interest or understanding of the benefits in hearing the views from the community, including children.

Some teachers (39%) also disagree with children being actively involved in preparedness planning. This result may come from the participants' understanding of the meaning of "active participation" which can be ambiguous and worthy for future investigation (i.e. what does 'active participation of children' mean

15   to different stakeholders?). Nevertheless, this presumption was strengthened by the child-focused NGOs where children are still seen as passive participants, and it is potentially a significant obstacle to children's participation in DRR through schools or classrooms where this perception is prevalent.

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

20   from disasters. The right for children to participate is protected in the Indonesian Child Protection Law (2002) and the UN Convention on the Rights of the Child (1989). There are also many documented case studies and preliminary research findings which demonstrate that children's active involvement brings added value including to the resilience of the community (Amri, 2015).

Many of the children living in Jakarta are prone to natural hazards. This is a risk to their safety and

25   wellbeing as well as access to essential services such as health and education. Therefore, taking into account the views from the children, it is clear that DRR education in schools will enhance their rights to both safety and to participate. Greater awareness is also needed among teachers on the benefits of children

actively participating in efforts to reduce risk in their schools and homes, perhaps through teachers' training.

5 Limitation of study and future research

This study involves a relatively small sample size of school personnel and NGO staff and focuses only on Jakarta. Nevertheless, the school personnel that took part in the survey were from schools classified as at-risk to floods and selected by the Jakarta Province Disaster Management Agency. The NGO staff were senior managers with more than 8 years of experience in implementing CCDRR in many areas in Indonesia and also from reputable child-focused agencies. The responses from NGO staff has strengthened the discussion and the recommendations.

Plans for further research using a longitudinal approach are underway, including expanding the sample size (more schools in Jakarta with diverse characteristics, including type of schools –i.e. public, private, and religious schools-, status of DRR education program –i.e. have ongoing DRR education program versus those with no DRR education program-, support from outside the school (NGO-supported, local-government supported, and no support), and types of exposure –i.e. school is frequently flooded, school is safe but the surrounding area is flooded, access to school disrupted due to floods-), additional stakeholders (parents and government officials), assessing wider topics of DRR (including disaster prevention, mitigation, as well as climate change adaptation), and also replicating the study in other areas in Indonesia.

6 Conclusions and recommendations

This study developed and tested tools to assess children and teachers' perspectives and knowledge on DRR, advances from previous studies implemented in developed country context. The tools developed were applicable to the Indonesian context and the results have generated a number of actionable recommendations (see below). The results highlight the strong desire for children to learn more on how to stay safe from disasters and reduce disaster risks in their communities. It also demonstrates that children are extremely interested in assisting their households and schools to become better prepared for disasters.

However, there is still a gap in children's knowledge on DRR. Seven key issues on implementing DRR education in Indonesian schools were identified based on the perspectives of children, school personnel and child-focused NGOs. These issues relate to: policies on DRR education in Indonesia; teachers' awareness of and access to DRR educational materials; teachers' capacity for implementation of DRR education in schools; partnerships between schools and other stakeholders; the lack of a platform for teachers to share experiences, successes, and challenges; dedicated personnel and budget; and, children's participation in DRR education and measures.

Thus, the following recommendations, which consider aspects of sustainability and scaling-up, are made based on each of the seven key issues.

1. As the authorising body, the Primary and Secondary Education directorates should lead efforts to **raise awareness of policies related to DRR education** to all school personnel and other education bodies across Indonesia. The directorates should also **include DRR aspects in the school monitoring process** so progress of DRR implementation is evaluated and reported.

2. Teachers should have access to **an online knowledge hub as a repository of educational resources**, including various guidelines and teaching manuals produced by various institutions. In addition, the Ministry of Education should take the lead in conducting a critical review of DRR education, including the **development of standardised key messages for DRR** in schools. Infusion of relevant key messages through the weekly flag ceremony and/ or weekly aerobics could be effective.

3. **A live and online discussion platform** should be established to connect teachers across Indonesia who have an interest in DRR education. A **competition at the national level** could also motivate "champions" in DRR education.

4. **DRR education training should be integrated into higher education programs** as part of teachers' professional development. Given Indonesia is a highly disaster prone country, basic knowledge of DRR should be part of teachers' minimum competencies. Although not a popular choice, **the use of e-learning and computer based training** is an option for participants who have access to the technologies.

5. **Joint activities to enhance preparedness should be fostered** particularly between schools and local councils and disaster management agencies. **Schools should also be part of the local DRR forum**.

6. Budgets should not be an issue since DRR is already part of the national curriculum. However, for comprehensive DRR activities (e.g. school retrofitting, training for teachers, school drills), schools could **obtain additional funding from the village funds** where the government is disbursing development funding to be managed at the village level.

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

These findings suggest that a change of strategy and introduction of new measures are essential to improve the implementation, and effectiveness, of DRR education in Indonesia. As previously described, work is

10 underway to expand the research -i.e. more schools, adding more stakeholders (parents and government officials), and expanding to broader topics (disaster prevention, mitigation, and climate change adaptation) and conditions (e.g., flood prone versus non flood prone).

While this study focuses specifically on Indonesia, particularly the urban setting of Jakarta, these key issues may well be apparent in many other developing and developed countries, and the suggested

15 recommendations may be applicable beyond Indonesia.

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