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The influence of background factors on children's level of learning about disaster: the case of Bandung metropolitan area

Dini Kusumawardhani



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MASTER THESIS

The influence of background factors on children's level of learning about disaster: the case of Bandung metropolitan area

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Abstract

After one decade of internalizing disaster management in a national plan, including in disaster education at schools, the disaster awareness level in Indonesia is still low. One of the possible factors that influence the outcome of disaster education is the limited efforts to understand the students' backgrounds. The main goal of the study was to analyze the potential influence of these background factors, which are the economic conditions, education level, living environment, ethnicity and culture, and religion, on the children's level of learning about disaster. The study was conducted through a disaster risk reduction program organized by a community-based organization Pahlawan Bencana for thirteen students in Bimasena School in Bandung regency. The methodologies used in this research were: 1) in-depth interview with the parents, 2) assessments through drawings and storytelling, and 3) connection of productive variables of factors with the level of learning. The results of the research suggest that the children's background factors, especially parental skill possession, dialogue intensity, the neighborhood safety, social cohesion in the community, and religion-based mental preparation, potentially influence the level of learning. These results provide further support for the hypothesis that the effectiveness of the disaster risk reduction program depends on the children's backgrounds.

Keywords: background factors, children's level of learning about disaster, disaster education, disaster risk reduction.

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Abbreviations

BNPB	—	Badan Nasional Penanggulangan Bencana / National Disaster Management Agency
DRR	—	Disaster Risk Reduction
Gol	—	The Government of Indonesia
PB	—	Pahlawan Bencana / the community-based organization who cooperated with the author in this research.
RT	—	Rukun Tetangga / smallest administrative unit in Indonesia
RW	—	Rukun Warga / second smallest administrative unit in Indonesia
TPA	—	Taman Pendidikan Al-Qur'an / the Islamic educational facilities

1 | Introduction

The Indian Ocean Tsunami in 2004, which left Indonesia as a devastated country with a death toll of around 130,000 (The BRR and International Partners, 2005) has been raising disaster awareness throughout the country. In addition to the adoption of the Hyogo Framework for Action in 2005, the Government of Indonesia (GoI) also formalized national law number 24 in disaster management in 2007. The effort was also followed by the establishment of the National Disaster Management Agency (BNPB) in 2008 and 462 local disaster management agencies by 2015 (BNPB, 2015).

In the National Plan of Disaster Management 2015-2019, the GoI has stated that there is a paradigm shift of disaster management from responsive to preventive action (BNPB, 2015). Capacity building in disaster management is one of the focuses in the Plan which enhances not only the capacity of hardware (technology and facilities) and software (guidelines and system) but also brainware (education and training) (BNPB, 2015). Investment in social capital is also mentioned in the Plan to encourage the involvement of the community and non-governmental organizations (NGOs) in disaster risk reduction (DRR) efforts, both separately or cooperatively (BNPB, 2015).

Out of several preventive actions that have been formulated, there are programs which are directly linked to education. These are Sekolah Aman, Sekolah Siaga Bencana, and the formulation of Materi Ajar Pendidikan Bencana (BNPB, 2015).¹ These disaster educational programs have been manifested in the national policy and integrated with the Ministry of Education. Training programs, such as drill and evacuation simulation for disasters, have been implemented in primary schools in cooperation with BPBD or Local Fire Departments and NGOs.

Despite the existence of primary teaching material prepared by BNPB, there is an increasing concern that the alternate implementation of the program is disadvantaging disaster education. Triyono et al. (2012) explained that even though the effort to mainstream DRR in schools has been ongoing since 2008, there is no affirmation through a legally binding policy in the implementation. The consequence is that educational institutions are lacking the commitment to implement the programs. Most of the disaster drill and training in schools is usually only applied if there is intervention from

¹ In Bahasa—Indonesian language, Sekolah Aman means “Safe Schools”, Sekolah Siaga Bencana means “Disaster Prepared Schools”, and Materi Ajar Pendidikan Bencana means “Teaching Material of Disaster Education”.

external actors, such as NGOs or international agencies. Besides, BNPB (2018) stated that the agency received only a small budget for disaster education and training.

The President of the Republic of Indonesia has recently addressed the issue of the lack of funds for disaster mitigation after the Sunda Strait tsunami in December 2018. The event ended the series of several significant disasters in 2018, with a total number of 4.814 deaths and declared missing people and more than 10 million people internally displaced, which are the highest numbers in the last decade (BNPB, 2018). To enhance citizens' preparedness, the GoI will allocate around 15 trillion Indonesian rupiahs for disaster mitigation in 2019, double the funds allocated in the 2018 (Deutsche Welle, 2019). One of the future implementations of mitigation efforts will include knowledge about disasters in existing school subjects in the earliest possible stage of education.

However, why, after one decade of internalizing disaster management in multilevel governance bodies with the seemingly rigid national plan, is the level of public disaster awareness still low and the number of deaths, including among children, still high?

One of the possible factors that influence the outcome of disaster education is children's backgrounds. In this research, the study of children's backgrounds will be explored through the DRR program conducted by community-based organization Pahlawan Bencana (PB) in Bimasena School in the Bandung Regency, West Java. The research aims to contribute to the social studies on how children's backgrounds can affect their vulnerability, their perception, their ability to receive information, and finally their level of learning about the disaster.

The overall structure of this research takes the form of five chapters — first, this introductory chapter. Second, a conceptual framework which focuses on the background factors that link to children's level of learning on the disaster. Third, the presentation of a case study followed by an explanation about methodologies. Fourth, a summary of results and findings. Fifth, the discussions. The final part is the conclusion.

1 | A | Research Question

What is the potential influence of background factors on children's level of learning about disaster?

1 | B | Hypothesis

The effectiveness of the DRR program depends on the backgrounds of the children, which include economic condition, education level, living environment, ethnicity and culture, and religion.

1 | C | Objective

Analyze the potential influence of background factors on the children's level of learning about disaster through the DRR program conducted by PB.

- To analyze in-depth the background factors of the families of the children involved in the DRR program of PB, specifically their economic condition, education level, living environment, ethnicity and culture, and religion.
- To analyze the potential increased learning or understanding of disaster after children were involved in the DRR program.
- To analyze the potential influence of the background factors on the children's level of learning on disaster

2 | Conceptual Framework

There has been an increasing amount of literature on education as an essential part of disaster risk management since the Indian Ocean Tsunami in 2004. Wisner (2006, p. 7) explained that "disaster education is a formal and informal transmission of knowledge, and engagement of groups of people (children, youth, lay people and professionals) in identifying hazards and possible actions to mitigate them and to prepare for the risk that cannot be reduced." The implementation of disaster education for children will have a significant impact in shaping a culture of prevention in society. Cameron and Tanner (2009) argue that "investing in child-centered DRR yield long-term benefits and future savings because learning and practicing DRR at an early age embeds changed behavior that can be integrated into adult life" (Lopez, Hayden, & Cologon, 2012, p. 6).

In several countries, disaster education has been mainstreamed in the school curriculum. Maiko High School in Hyogo Prefecture, Japan, for example, offers a course entitled "Environment and Disaster" where students experience not only in-class information sessions but also a site visit to Nojima fault and the memorial center for the Great Hanshin Awaji Earthquake (Wisner, 2006). In other contexts, there is also the implementation of informal education under the concept of community-based disaster

management. As reported by Izumi & Shaw (2014), SEEDS India has been advocating for the role of schools and students as important actors in creating disaster awareness in Andaman community since 2005.

As schools become a melting point of children from different backgrounds, Jabry (2003) and Peek (2008) found that children's vulnerabilities have been described as a function of various factors. The interacting factors include, but are not limited to, "age, gender, geographical location, ethnicity, socio-economic status, disability, health status, social networks, whether that child is a wage earner, and perhaps most importantly, the traditional role ascribed to children in a particular society." (Lopez et al., 2012, p. 5). Also, Pfefferbaum, Jacobs, Houston, & Griffin (2015) and Pfefferbaum et al., (2016) associated better coping with individual factors such as education, previous level of trauma exposure, life stressors, and familial supports (Midtbust et al., 2018). Those backgrounds also have contributed to the power relations between children and their families, such as whether children have a voice in the family decision or are solely passive members in the family and community.

Previous studies show the importance of paying attention to factors in the disaster study field related to children and their families. In order to check the research objective, this research will only focus on five factors, which are economic conditions, education level, living environment, ethnicity and culture, and religion. Those factors were chosen by considering the consistency of the factors mentioned in previous studies as contributing factors to the vulnerability of children and their family.

The first factor is the children's economic conditions. In each household, the financial situation varies regardless of location and living environment. Families with low incomes may find it hard to prioritize disaster preparedness because they need to first fulfill the family's basic needs of shelter, food, and clothes. Poverty, as mentioned by Few (2003), Brouwer et al. (2007), and Zang (2009) is "generally considered an essential influencing factor underlying socio-economic vulnerability because it leads to fewer opportunities to take adaptive measures," (Brouwer, Admiraal, Dusseldorp, Bui, & Tran, 2010, p. 6). In the previous study in Bangladesh by Brouwer et al. (2007), there is a finding that "lower income groups living closer to the river are more vulnerable to catastrophic floods than higher income groups living further away from the river." (Brouwer et al., 2010, p. 31). The example showed that inability to afford to live in a safer area exposed lower income families to both daily stressors, like overflowed rivers, and shocks, like catastrophic floods.

In the case of a natural hazard, there is no guarantee that only low-income families are affected. “Not all poor people are vulnerable to disasters, nor are the poor all vulnerable in the same way, and some people who are not poor are also vulnerable.” (Hillhorst & Bankoff, 2004, p. 2). However, the level of impact might be different. For example, Cannon (2000) states that the disruption and the impact are disproportionately harmful to those who are already poor. Cannon calls this “double loss” while Pizzigati (2018) calls this “economic disaster” because households with decent incomes often do not have many assets. Natural disaster as a significant disruption will then definitely affect these asset-poor households.

Another essential thing to be concerned about regarding lower income families is the post-disaster condition. In his research in Bangladesh, Cannon (2000) notes that more impoverished people in lower classes might have less job security after a flood and lower levels of savings to buffer them against the shock. He also mentions an example of economic disruption related to the employment, explaining that “loss of a significant employer through building damage will cause not only a loss to the business (and the insurer) but also widespread disruption of livelihoods and earning capacity for employees, whose vulnerability may be high.”

As a basic need for life improvement, Muttarak and Pothisiri (2013, p. 2) argue that “education, in particular, is a key tool to promote disaster preparedness because highly educated individuals have better economic resources to undertake preparedness actions and because education may influence cognitive elements and shape how individuals perceive and assess risks, and how they process risk-minimizing information (Menard et al. 2011).” Codreanu et al. (2014) found that “behavioral change in disaster preparedness has been observed to result mostly from community and family education” (Midtbust et al., 2018, p. 6).

Midtbust et al. (2018) think that parents’ way of thinking and response to the disaster will influence children and adolescents. “Children may follow their parents’ advice to survive, and also model the behavior of their parents. Knowledgeable parents may, therefore, secure increased survival for both themselves and their offspring.” (Midtbust, 2018, p. 5). Also, Codreanu et al. (2014) mentioned that “previous research has shown that survival likelihood is higher among parents with prior knowledge of earthquakes and that this directly affects their children’s understanding and knowledge” (Midtbust, 2018, p. 5).

Additionally, Wisner (2006) notes that adult literacy is fundamental in communicating risk. His research shows that “there are very specific correlations between literacy,

especially female literacy, and child survival and productivity.” (p. 53) He emphasizes that literacy is critical, for example, when engaging a population in considered dialogue with experts, such as planners and climate and weather forecasters (Wisner, 2006). Furthermore, illiteracy will potentially increase the whole family’s vulnerability in the emergency stage due to their low ability in recognizing useful signs for evacuation or in understanding the warning system. Conversely, the low rate of parents’ literacy potentially limits their access to numerous sources and discourses about the disaster, and thus also limit their ability to discuss with their children.

Discussing hazard and its effects are essential to increase children’s resilience. For instance, Midtbust et al. (2018, p. 5) argue that by doing so, parents provide a ‘coping model’ for children and adolescents. However, Midtbust et al. (2018) suggest that children’s resilience depends on whether parents have an inclusive communication style to engage the children in discussions or not, because discussing with children may be difficult for parents. Child Welfare Information Gateway (2014) still recommends that parents not avoid difficult topics or uncomfortable conversations, but rather listen to their children, reassure them and correct any misunderstandings they might have. (Midtbust et al., 2018). Also, Codreanu et al. (2014) and Johnson et al. (2014) state that “children’s engagement with parents both facilitates knowledge transfer from children to parent and improves the quality of children’s learning” (Midtbust et al., 2018, p. 6).

In the case of Bandung metropolitan area, Yulianto (2011) has predicted that the region experienced its last high magnitude earthquake approximately hundreds to a thousand years ago (Ameridyani & Sagala, 2015). When an area has suffered no significant disasters for generations, the history of past accidents might be interrupted due to the aging factors or even the death of the previous survivors. The discontinuity of history might generate current residents who are uninformed about previous disasters and the lessons learned from these. According to Midtbust et al. (2018), some studies, such as those conducted by Halpern-Felsher et al. (2001) and Johnson et al. (2014), suggest that “there is a link between prior disaster experience and risk perceptions” (p. 5). They further mentions an example that “in areas where landslides have taken place previously, the events may continue to live on in people’s collective memory and become a part of children’s upbringing, influencing their perception of risks.” (p. 6) In other words, Bandung residents who (and whose close family members) never experienced a disaster before may have a different perception to those who have been through such calamities.

Moreover, Ameridyani & Sagala (2015) assert that the long span of the inexistence of shocks in Bandung has created denial within the community with regards to the potential

for disaster in their environment. Refusal of scientific explanations about the hazards is dangerous for society because it will create an assumption that they are disaster-free. Disaster Reduction Learning Center (2008) states that “thinking only that one is safe and secure or only that one’s community is safe exacerbates the damage that is incurred should a disaster occur.” (p. 6) Thus, the danger that lies in the generally unaware communities is on their overestimation on their ability to cope with crises.

Furthermore, the factor of living environment might be one of the most discussed discourses in disaster studies. Faas (2016) shows that “people living on or near active volcanos, fault lines, flood plains, tornado alleys, and coastlines (to name but a few hazards) are at risk principally because of their proximity to these hazards.” (p. 16) Previous studies reported that the proximity to hazards also influenced risk perceptions. Barberi, Davis, Isaia, Nave, & Ricci (2008) found that people who live closer to the Vesuvius volcano in Italy reported higher risk perceptions compared to those who live further from the volcano. Arias, Bronfman, Cisternas, & Repetto (2017) also showed supporting findings that proximity recognition, including visibility of hazard, contributed to higher risk perceptions.

Not only natural features, but also human-made features and land use in the area contributed to the type of stressors the residents were exposed to. Davis et al. (2015, p. 92) pointed out that “population density remains a critical vulnerability factor”. They referred to United Nations’ 2011 report and Provost’s 2013 research, which found that “the high concentration of people results in the dense occupation of unsafe lands prone to most hazards,” as seen in Bangladesh. Lock et al., (2012) suggest that, besides primary stressors such as major disasters, “secondary stressors such as continued lack of infrastructure can manifest its effect shortly after a disaster and persist for extended periods.” (p. 1) In the context of urban areas in Indonesia, the secondary stressors related to the living environment include, but are not limited to, pollution—air, water, and noise, inadequate waste management, and heavy traffic.

Looking into cultural perspective of disaster vulnerability, social scientist Boholm (2003) states that “people’s perception or understanding of natural disasters is socially constructed,” (Adomah Bempah & Olav Øyhus, 2017, p. 104). Boholm argues that culture is crucial to social perceptions of risks or natural hazards. The World Disaster Report, Culture, and Disasters (2014) also reported on the relationship between culture and the perception of hazards, explaining that “culture is explained as the beliefs, attitudes, feelings, experiences, values and narratives, and their associated behaviors,

actions, and day-to-day routines that are shared by most people in respects to threats and hazards.” (Adomah Bempah & Olav Øyhus, 2017, p. 105).

Roncoli et al. (2009) found that “culture—shared patterns of meanings and relationships—frames perception, which in turn affects the way people respond to environmental dynamics” (Faas, 2016, p. 20). Thus, for a large country like Indonesia, (Shaw, 2014) states that the customization of risk reduction based on local context is essential. With hundreds of ethnicities and languages spoken in the country, each area in Indonesia has its cultural values applied in daily life. Along with social networks, those values are collectively created Social Capital that include trust and norms among people which can be formed in society (p. 15).

Putnam (1993) defined social capital as “features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit.” (Hishida & Shaw, 2014, p. 53). Hishida & Shaw (2014) refer to Social Capital Initiative, World Bank’s definition of social capital as “the glue that holds societies together and without which there can be no economic growth or human well-being.” (p. 52) They also quote Norris (2002) which states that there are two phenomena of social capital based on Putnam’s theory: the structural phenomenon (social networks) and the cultural phenomenon (social norms) (Hishida & Shaw, 2014).

The creation of social networks and norms are also part of the adaptation process of internal migrants. The interisland migration in Indonesia has been creating acculturation in different places that forces migrants to adapt to the culture of their host communities. In their research, Shaw, Uy, & Baumwoll (2008) found that “migrant communities have less knowledge than a community that has been settled in a specific area for generations.” (p. 37) Network building is essential for migrants in order for them to gain insight from locals and thus prepare themselves for natural events that are not familiar for them.

Beside cultural norms and values, belief is considered one of the most critical things in Indonesians’ daily life. Religious values in society have been the most effective fuel in believing that disasters are God’s will and a natural force which needs to be received sincerely. This receiving attitude has made Indonesians well-known as a resilient society. However, Adomah Bempah & Olav Øyhus (2017) speculate that “beliefs and perceptions that attribute the causes of a social problem to divinity and other factors outside personal actions may impact negatively on individual or household mitigation strategies.” (p. 107)

The receiving attitude can sometimes neglect the possibility that natural forces can be controlled to minimize the impact through different layers of DRR efforts.

In his research about the view of Islam on earthquakes, Ghafory-Ashtiany (2015) takes the reader back to a time where people have limited knowledge about natural phenomena. People believe that “powerful but arbitrary forces were responsible for their miseries.” (Ghafory-Ashtiany, 2015, p. 218). They think that natural hazards are either God’s will or God’s expression of anger as the results of people’s sins. He describes that ancient Maya people even have a god for every natural phenomenon; Hurakan as the god of thunderstorms, Pillan as the god of earthquakes and volcano eruptions, and a god of thunder (Ghafory-Ashtiany, 2015).

Ghafory-Ashtiany (2015) interpreted the central teachings that can be adapted to the principle of DRR as a form of encouragement to do “good deeds”, “do not harm (both human and environment)” and “take advantage of wisdom and knowledge” to avoid destruction (because of natural events). He elaborates “belief” as “believing that Our Creator’s guidance is the best of human performance and better living.” Also, “believing in wisdom, facts, and expertise; as well as accepting respecting and following spiritual, individual, social and technical laws, rules and regulations.” Thus, he concludes that “disaster is not God’s wrath or his anger about humanity; it is simply the result of people’s bad deeds and failure to follow God’s guidance in all aspects of our lives.” (Ghafory-Ashtiany, 2015, p. 230). Complementing to Ghafory’s research, Adiyoso and Kanegae (2013) who studied the Islamic teaching in the DRR, mention the importance for Muslims of asking (*Doa*) Allah for protection.

In the context of Indonesia, religion plays an essential role in all walks of life. Edward (2005) observed that “religious leaders are even perceived as educated people who have better knowledge about Islamic teaching, thus making people dependent on them in all aspect of their life,” (Adiyoso & Kanegae, 2013, p. 927). Children in Indonesia are exposed to religious teaching from a very young age because their families usually send them to religion-based educational institutions or attend routine religious activities. Such religious values were explained by Pargament et al. (2005) to increase religious coping, by which he means “the degree to which religion is a part of the process of understanding and dealing with critical life events,” (Krok, 2015, p. 2294).

Figure 1. Conceptual model of the potential influence of background factors on children’s level of learning about disaster. The model was developed by the author.

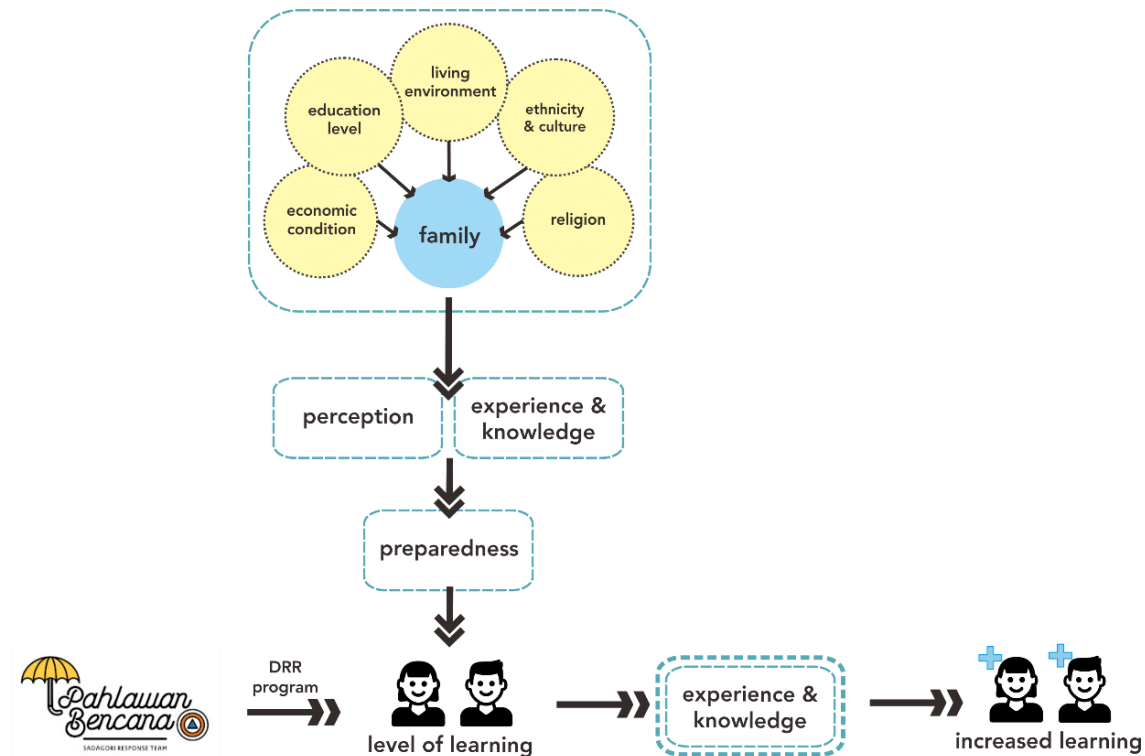


Figure 1 presents an overview of how the five background factors of the family might have an impact on the children’s level of learning about disaster. These factors play an essential role in constructing families’ experiences and knowledge and shaping risk perceptions, which later on determine the level of preparedness of the family, as well as the children’s level of learning. The involvement of PB through their DRR program is a tool to analyze the potential influence of children’s background factors on their level of learning. That is, it lets us evaluate—whether or not knowledge is improved after exposure to the program, thus checking the effectiveness of the DRR program itself.

Overall, these studies outline the influence of each background factor on family vulnerability. However, the background factors discussed in several kinds of literature were in the general context, which is difficult to transfer to the Indonesian context considering the complexity of each factor. Also, the previous research examined the factors separately and without showing an interrelation among those factors. Therefore, the study on children’s background in Bandung metropolitan area seeks to obtain data on those factors as an interrelated entity in order to understand the potential influence on the children’s level of learning about disaster. Considering the limited discussion of background factors in DRR studies in Indonesia, the study aims to address these

research gaps and contribute as a reference for customizing DRR programs for the effectiveness of the DRR efforts in Indonesia.

3 | Case Study and Research Methodology

3 | A | Case Study

In accordance with the National Disaster Management Plan, BNPB has specified the national priority locations for DRR focus based on 12 types of natural and human-made disasters, including earthquakes, to which the highest number of residents are exposed to risk—around 200 million people (BNPB, 2015). The province of West Java is a priority location for earthquake risk reduction due to both its geological condition and its high population.

Bandung metropolitan area, which comprises of Bandung, the capital city of West Java, and surrounding areas of Bandung Regency, West Bandung Regency, and the City of Cimahi, is located in the high-risk zone. Due to the active tectonic plate called Lembang Fault that lies below the metropolitan area, The Indonesian Agency for Meteorology, Climatology, and Geophysics has predicted that the tectonic plate could generate an earthquake of 6.8 magnitude scale in the future (Hanifan, 2017). The plate stretches for 29 kilometers from the west to the eastern part of the Bandung basin and is located less than 15 kilometers from the city center.

Besides the earthquake potential, the surrounding hills also make the area prone to the landslides, especially during the rainy season, when they can be triggered by great earthquakes or caused by massive deforestation. The soft type of soil from the ancient lake, where the metropolitan area currently sits, also increases the area's vulnerability to landslides and moderate liquefaction when the earthquake occurs (Anisuzzaman, 2013). This condition makes it possible for the quake to have a multilayered effect, as experienced during the 2018 Central Sulawesi earthquake and tsunami.

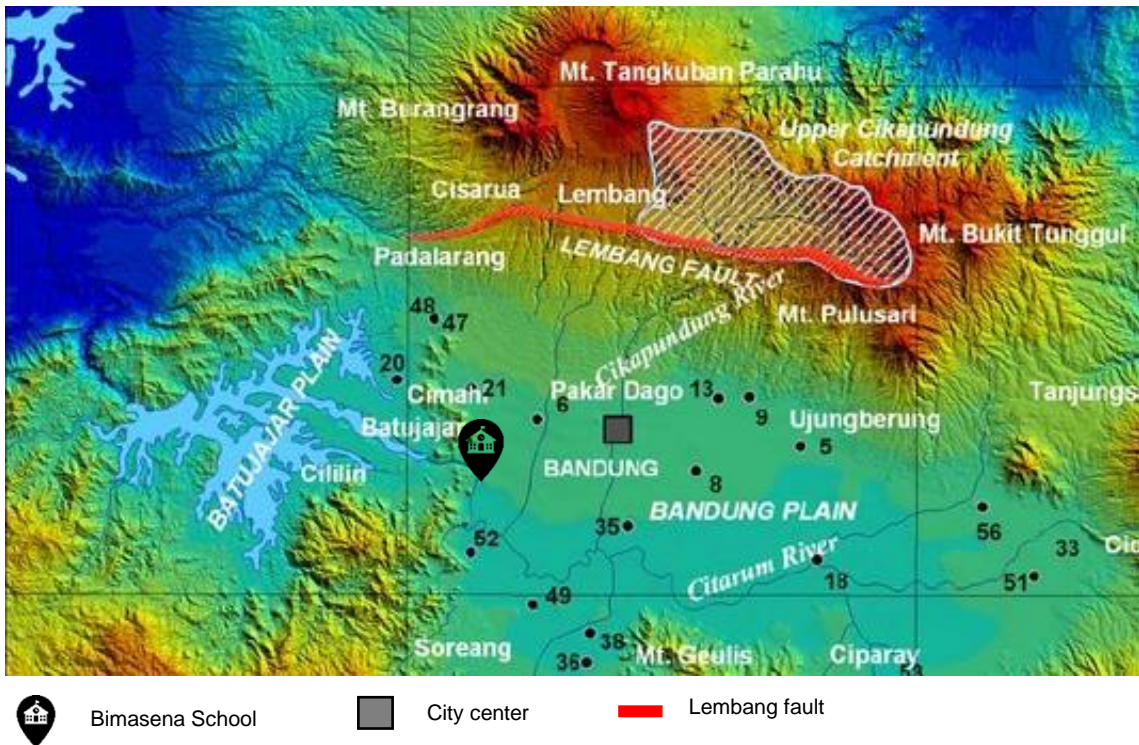
As the second largest metropolitan area in Indonesia, Bandung metropolitan area has contributed to the country's economy through tourism, hospitality business, and creative industries. This economic factor also contributes to the rapid development of the city, especially due to the construction of new hotels, villas, meeting centers, and other hospitality facilities over the years. The metropolitan area is home to approximately 8.5 million people – of whom around 2.3 million are children under 15 years old – who live

in the area (BPS Provinsi Jawa Barat, 2018). One of the essential characteristics of the metropolitan area is its proactive citizens and the culture of *ngariung*—meaning “to gather,” which has contributed to the growing numbers of creative community groups which build collaboration through dynamic networks (Prayudi, Probosari, & Ardhanariswari, 2017). Even though the systems are initially comprised of arts and culture enthusiasts, for the last decade the phenomenon is shifting to more interdisciplinary collaboration with the objective of tackling global issues, such as climate and disaster.

Several CBOs in Bandung dedicate their time to develop programs for DRR, including spreading awareness about the disaster in schools. One of these CBOs is PB. PB is an organization comprised of volunteers from interdisciplinary backgrounds—from geology to business management, and from early childhood education to the economy. In their programs, PB introduces participants to different types of disaster that could potentially happen in Indonesia. In order to transmit knowledge about the disaster, PB uses different tools adjusted to different age groups, such as video, folklore, storytelling, song, posters, and group activities, as creative tools to engage with children in DRR programming.

To achieve the research objectives, Bimasena School is the leading case study in this research. Bimasena School is a primary school located in Marga Asih subdistrict in Bandung Regency. The subdistrict is a peri-urban area—approximately 14 kilometers from the heart of the city and 29 kilometers from the active fault. The school is located close to the industrial sector and its dense settlement, and surrounded by hills and passed by the Citarum river stream.

Figure 2 The position of Bimasena School, the city center and Lembang fault in Bandung metropolitan area. Source: Delinom, R. (2009)



3 | B | Research Methodology

The methodological approach that was taken in this study is qualitative to achieve these specific research objectives:

- **Objective 1**

To analyze in-depth the background factors of the families of the children involved in the DRR program of PB, specifically their economic condition, education level, living environment, ethnicity and culture, and religion.

Methodology 1

Conduct an in-depth semi-structured interview (around 20-70 minutes) with the parents. The keywords from the interview were extracted to determine the productive variable of each factor by observing a frequently discussed topic closely related to the level of vulnerability. The family profile is then identified, based on the data of each productive variable.

- **Objective 2**

To analyze the potential increased learning or understanding of disaster after children were involved in the DRR program.

Methodology 2

Conduct pre and post-assessment through drawings and storytelling which were executed before and after the DRR program. With the prior consultation with clinical psychology master students and a certified art therapist, children were instructed to draw their actions should they feel that there is an earthquake at school. The children then clarified the drawings through storytelling with the guidance of three facilitators, which are the author, one author's team member, and a representative of PB.

In order to assess the increased learning of the children based on the drawings and oral stories, the author set two indicators, which are:

1. The specific actions, knowledge, and messages from the DRR program which were repeated by the children and distinctly appeared in the drawing and oral stories, such as:
 - a. Different types of disasters
 - b. Disaster prevention, risk reduction, and preparedness (to name a few: do not litter, do not cut down trees carelessly and illegally, and prepare an emergency bag)
 - c. Disaster responses (to name a few: find shelter under the table during an earthquake, wear boots in case of flooding, and run to higher ground in case of tsunami).
2. The existence of specific actions that go beyond 'running to save their lives during a disaster,' since running is the most common and natural immediate response.

Increased learning is recorded if the children's post-assessment drawing fulfilled **at least one** of the indicators.

- **Objective 3**

To analyze the potential influence of the background factors on the children's level of learning about disaster.

Methodology 3

Connect the productive variables of the background factors with the level of learning.

In addition to the primary data collection, secondary sources were collected through:

1. Previous research on DRR
2. Library studies on background factors of families and children that related to their vulnerability.

3 | C | Participants

The author recruited thirteen students in the second grade in Bimasena School for the assessments. The participants are purposive samples which were selected to be balanced, with the help of the teachers, according to the five background factors. These samples included ten boys and three girls between 7-8 years old who were mostly Muslims, Sundanese, raised by multiple income families who have high school educations, and live surrounded by hills and industrial areas in Bandung regency.²

4 | Results

4 | A | The Family Profile Based on the Background Factors

Table 1 The family profile based on the background factors

Family	Background factors	Keywords	Productive variables	Data
1	Economic condition	Mother's skill in cooking and entrepreneurship skills	Skills	Skilled mother
	Education level	Willingness to have a dialogue with the children	Dialogue intensity	Average
	Living environment	<ul style="list-style-type: none"> • Proximity to the excavated hills • Dense settlements 	Safety	Unsafe
	Ethnicity and culture	<ul style="list-style-type: none"> • Teach the children to be polite • A community leader is active in gathering people 	Social cohesion	Strong
	Religion	Teach the children to pray to ask for protection from God	Value for preparation	Mental
2	Economic condition	Mother's skill in entrepreneurship	Skills	Skilled mother
	Education level	Never discuss disaster on purpose	Dialogue intensity	Low
	Living environment	<ul style="list-style-type: none"> • Waste problem • Muddy access to the house • Dense settlement 	Safety	Unsafe
	Ethnicity and culture	Less involvement in the community due to the short term residency	Social cohesion	Weak
	Religion	<ul style="list-style-type: none"> • Hold on to the verses in the Holy Koran about disaster management • Teach the children to keep the environment clean 	Value for preparation	Physical
3	Economic condition	Mother's skill in midwifery and father's skill in construction	Skills	Skilled parents

² Sundanese refers to both a dominant ethnic group and the local language spoken in West Java.

Family	Background factors	Keywords	Productive variables	Data
	Education level	Willingness to have a dialogue with the children	Dialogue intensity	Average
	Living environment	Proximity to the river	Safety	Unsafe
	Ethnicity and culture	A good relationship with neighbors and active community leader	Social cohesion	Strong
	Religion	Teach the children to be patient and not blame others for disaster	Value for preparation	Mental
4	Economic condition	Mother's skills in teaching skills	Skills	Skilled mother
	Education level	Parents are occasionally teaching their children about disaster from things that are seen every day	Dialogue intensity	Average
	Living environment	<ul style="list-style-type: none"> Proximity to the excavated hills Dense population Inundated access to the house 	Safety	Unsafe
	Ethnicity and culture	Have a good relationship with neighbors despite inactive neighborhood leaders	Social cohesion	Strong
	Religion	No data	No data	No data
5	Economic condition	No skill	Skills	Unskilled
	Education level	<ul style="list-style-type: none"> Mother works out of town and is not at home daily Father works and has little time with children 	Dialogue intensity	Low
	Living environment	<ul style="list-style-type: none"> Proximity to the excavated hills Dense population 	Safety	Unsafe
	Ethnicity and culture	<ul style="list-style-type: none"> Teach the children to respect older people, be friendly and polite Kinship in the neighborhood 	Social cohesion	Strong
	Religion	Surrendering life to disaster as God's fate, and be resilient	Value for preparation	Mental
6	Economic condition	Mother's skills in cooking and entrepreneurship	Skills	Skilled mother
	Education level	Parents are active in building children's knowledge, i.e., dialogue and field trip	Dialogue intensity	High
	Living environment	Proximity to the excavated hills	Safety	Unsafe
	Ethnicity and culture	Less involvement in the community due to the short term residency	Social cohesion	Weak
	Religion	Teach the children to give charity to the needy	Value for preparation	Mental
7	Economic condition	Mother's skills in knitting and teaching, and father's skills on electricity and welding	Skill	Skilled parents
	Education level	Have some knowledge about disaster preparedness, but never transmit them to the children	Dialogue intensity	Low
	Living environment	<ul style="list-style-type: none"> Proximity to the excavated hills Exposure to run-off overflows 	Safety	Unsafe
	Ethnicity and culture	Have a good relationship with neighbors despite inactive community leaders	Social cohesion	Strong
	Religion	Teach the children not to feel sad should disasters occur, accept the reality, do not give up, pray, and surrender	Value for preparation	Mental

Family	Background factors	Keywords	Productive variables	Data
8	Economic condition	The mother manages a TPA ³	Skill	Skilled mother
	Education level	Parents are casually teaching their children about disaster	Dialogue intensity	High
	Living environment	Proximity to the excavated hills	Safety	Unsafe
	Ethnicity and culture	<ul style="list-style-type: none"> Casual information exchange with neighbors Children love to play outside with peers 	Social cohesion	Strong
	Religion	Surrendering life to disaster as God's fate	Value for preparation	Mental
9	Economic condition	Mother's skill in haircutting	Skills	Skilled mother
	Education level	Underestimate the children's understanding of disaster and thus avoid dialogue about the issue	Dialogue intensity	Low
	Living environment	<ul style="list-style-type: none"> Proximity to the excavated hills The potential of liquefaction due to the house location, which is over the paddy field 	Safety	Unsafe
	Ethnicity and culture	The feeling of insecurity of being unaccepted in society due to belief differences	Social cohesion	Low
	Religion	Surrendering life to disaster as God's fate	Value for preparation	Mental
10	Economic condition	Mother's skills in cooking and entrepreneurship	Skills	Skilled mother
	Education level	Responsive to the children's questions about disasters, but the parents face a challenge spending time with family due to their work shifts	Dialogue intensity	Average
	Living environment	<ul style="list-style-type: none"> Proximity to the excavated hills Strong wind Dense settlement 	Safety	Unsafe
	Ethnicity and culture	A strong relationship with neighbors in a majority Javanese neighborhood	Social cohesion	Strong
	Religion	Oblige the children to recite The Holy Koran and fast	Value for preparation	Mental
11	Economic condition	No skill	Skills	Unskilled mother
	Education level	Parents' are open to children, but never introduce disaster preparedness	Dialogue intensity	Average
	Living environment	<ul style="list-style-type: none"> Proximity to the excavated hills Dense settlement 	Safety	Unsafe
	Ethnicity and culture	A strong relationship with neighbors and active community leaders	Social cohesion	Strong
	Religion	Emphasis on the value of giving charity for those in need	Value for preparation	Mental
12	Economic condition	Mother's skill in sewing	Skills	Skilled mother
	Education level	Responsive to children's questions about disaster	Dialogue intensity	High

³ TPA stands for Taman Pendidikan Al-Qur'an. TPA is an educational facility which based its teaching on The Holy Koran and Islamic values. Usually, children in Indonesia go to the TPAs after their regular school hours.

Family	Background factors	Keywords	Productive variables	Data
	Living environment	No significant physical characteristics with high vulnerability	Safety	Safe
	Ethnicity and culture	<ul style="list-style-type: none"> • Teach the children to respect the elderly and be tolerant of people with different beliefs • A healthy relationship with neighbors 	Social cohesion	Strong
	Religion	<ul style="list-style-type: none"> • Surrendering life to disaster as God's fate • Emphasis on the value of giving charity for those in need 	Value for preparation	Mental
13	Economic condition	Mother's skill in teaching (mathematics)	Skills	Skilled mother
	Education level	Parents are open to talking about disasters	Dialogue intensity	High
	Living environment	Proximity to the excavated hills	Safety	Unsafe
	Ethnicity and culture	A strong relationship with neighbors and community leaders	Social cohesion	Strong
	Religion	Teach the children to keep the environment clean	Value for preparation	Physical

4 | B | The Assessment of the Children's Increased Learning

Table 2 The assessment of the children's level of learning

Student	Assessment remarks	Increased learning		
		Yes		No
		Repetition from the DRR program	Actions beyond running	
1	The post-assessment drawing indicates that the student learned different types of hazard from the DRR program. The drawing is accompanied by disaster responses which go beyond running, e.g., find shelter under the table in case of an earthquake.	√	√	
2	Both drawings show different situations. In the pre-assessment, he drew a tsunami event. In the post-assessment, the student delivered a story of an unusual response in the case of volcanic eruption: people approaching the crater to seal it, but dying instead. The explanation may seem naive or imaginative, but it also shows ignorance of the right action in such a situation.			√
3	In the post-assessment, the student drew a different type of hazards and erased "meteor" and "volcano eruption" which were in his pre-assessment drawing; possibly because those hazards were not the main topic in the DRR program. The drawing is accompanied by disaster responses which go beyond running, e.g., climbing to higher ground in case of a tsunami	√	√	
4	In the post-assessment, the student drew two different types of hazards which were each accompanied by a response. For the earthquake, she drew what was repeatedly delivered and practiced during the DRR program, which was "find shelter under the table."	√	√	
5	The student developed a more complex situation in his post-assessment drawing; three interrelated hazards where an earthquake and a volcano eruption triggered landslides. There is no specific action beyond running in his drawing.	√		
6	In the post-assessment, the student drew different situations with additional information on the driving	√	√	

Student	Assessment remarks	Increased learning		
		Yes		No
		Repetition from the DRR program	Actions beyond running	
	cause of flooding: irresponsible littering. He also drew people floating with buoys which were not mentioned during the DRR program.			
7	Compared to the pre-assessment drawing in which the student drew the flat surface of the ground, in the post-assessment, the student specifically drew people climbing to higher ground to prevent contact with mudflows in case of a volcano eruption.		√	
8	The student drew the same situation in both assessments: volcano eruption. Unlike in the pre-assessment, in the post-assessment he drew houses at the foot of the mountain and people running away from their houses to the street to avoid contact with mudflows.		√	
9	In the post-assessment, the student drew an earthquake situation with people trapped in the car in the middle of the cracked street. He stated that people should leave the car in such a situation.		√	
10	Both drawings are about volcano eruption. In the post-assessment, the student drew people running to the unerupted mountain—indicating a safe place—which stands side by side with the erupted volcano.		√	
11	Unlike in the pre-assessment drawing, the student drew different types of hazards in panels along with the title and brief remark for each hazard. The drawing is accompanied by disaster responses which go beyond running, e.g., going directly to the evacuation place in case of a volcano eruption.	√	√	
12	In both assessments, the student explained a volcano eruption systematically and scientifically. He even developed more explanation in the post-assessment about, for example, animals who behave strangely before the disaster because they can feel the temperature difference.	√	√	
13	In the pre-assessment, the student did mention about running as a way to save lives in case of a volcano eruption. However, in the post-assessment about flooding, she showed other responses, such as wearing boots. She also explained the driving factor of flooding: irresponsible littering.	√	√	

Students who demonstrated the greatest increase in learning—who both repeated the information from the DRR program and showcased the actions beyond running—will be identified as “Yes+.”

4 | C | Combination of the Productive Variables and the Children’s Increased Learning

Table 3 The combination of the productive variables and the children’s increased learning

Student and family	Productive Variable					Increased learning
	Skill possession	Dialogue intensity	Neighborhood safety	Social cohesion	Religion-based preparation	
1	Skilled mother	High	Unsafe	Strong	Mental	Yes+

Student and family	Productive Variable					Increased learning
	Skill possession	Dialogue intensity	Neighborhood safety	Social cohesion	Religion-based preparation	
2	Skilled mother	Low	Unsafe	Weak	Physical	No
3	Skilled parents	Average	Unsafe	Strong	Mental	Yes+
4	Skilled mother	Average	Unsafe	Average	-	Yes+
5	Unskilled	Low	Unsafe	Strong	Mental	Yes
6	Skilled mother	High	Unsafe	Weak	Mental	Yes+
7	Skilled parents	Low	Unsafe	Average	Mental	Yes
8	Skilled mother	High	Unsafe	Strong	Mental	Yes
9	Skilled mother	Low	Unsafe	Weak	Mental	Yes
10	Skilled mother	Average	Unsafe	Strong	Mental	Yes
11	Unskilled	High	Unsafe	Strong	Mental	Yes+
12	Skilled mother	High	Safe	Strong	Mental	Yes+
13	Skilled mother	High	Unsafe	Strong	Physical	Yes+

Table 4. Summary of the background factors of children with most increased learning (yes+)

Skill possession	Dialogue intensity	Neighborhood safety	Social cohesion	Religion-based preparation
<ul style="list-style-type: none"> ▪ 6 / 7 children have skilled parents, mainly the mothers. ▪ 1 / 7 children has unskilled parents. 	<ul style="list-style-type: none"> ▪ 5 / 7 children have high dialogue intensity with the parents ▪ 2 / 7 children have average dialogue intensity with the parents 	<ul style="list-style-type: none"> ▪ 6 / 7 children live in an unsafe neighborhood. ▪ 1 / 7 children lives in a safe neighborhood. 	<ul style="list-style-type: none"> ▪ 5 / 7 children live within a community with strong social cohesion ▪ 1 / 7 children lives within a community with average social cohesion ▪ 1 / 7 children lives within a community with weak social cohesion 	<ul style="list-style-type: none"> ▪ 5 / 7 children were taught about mental preparation ▪ 1 / 7 children was taught about physical preparation. ▪ 1 / 7 children was taught about unknown preparation.

5 | Discussion

This study set out with the aim of analyzing the potential influence of background factors on children's level of learning on disaster within the context of Indonesia. The results suggest that background factors, which are economic condition, education level, living environment, ethnicity and culture, and religion, potentially influenced the children's level of learning.

However, some limitation of the results need to be understood. First, the qualitative approach with the small sample size is not enough to demonstrate a correlation between

the background factors and the level of learning, so the current study is more about observing tendencies in the research samples. Second, the complex research question involves five different potentially interrelated dimensions and thus could generate confusion in demonstrating a direct correlation between each factor and the level of learning. Third, there is a lack of previous studies on the topic, which resulted in more effort to create assumptions.

Based on the results, six out of seven children with the greatest increase in learning were raised by skilled parents, mainly mothers who currently or used to work. The result indicates that the parents' skill possession had influenced the children's increased learning. The explanation for the result may be that the professional practice of mothers allowed them to interact with more people and gain more knowledge about the environment, thus potentially enhancing their capacity to face significant events like a disaster. Considering the fact that the mothers tend to interact more with the children, the knowledge will only affect the children's understanding should the mothers transmit such knowledge to the children through dialogue. Possessing skills and knowledge will be of no benefit to the children without dialogue, as they will only stay as abstract concepts which do not affect anyone. Midtbust et al. (2018) called this an inclusive communication style where parents engage their children in disaster discussions, where it closely links to the following factors.

For the education factor, the results show that all children with the greatest increase in learning were raised in families with average to high dialogue intensity, and the children with no improved knowledge conducted no dialogue at all with the parents. This finding shows that the more time parents spent building daily discussions on disaster with children, the more children understood about disaster. Also, discussing disaster as a family contributes not only to the children's but also to the parents' understanding, as the discussion is a mutual learning process. This result matches those observed in earlier studies by Codreanu et al. (2014) and Johnson et al. (2014) that children's engagement with parents both facilitates the knowledge transfer from children to parent and improves the quality of children's learning (Midtbust et al., 2018).

Moving on to the living environment, six out of seven children with the greatest increase in learning live in hazardous areas. This result shows that the more the children were exposed to hazard, the more they learned about their environment and thus increased their level of learning. A possible explanation for this result may be the proximity of the majority of the children's houses to the excavated hills. The result supports the findings of Arias et al. (2017) and Barberi et al. (2008) that proximity, and thus the visibility, of

potential hazards contributed to the higher risk perceptions. The children's daily exposures to the distinct natural features are strong enough to create attachment and memory in their minds. The memories play the role of their prior knowledge and, with the exposure to the new information in the DRR program, it is easier for them to combine the prior and new knowledge into their drawings. This is proven by the fact that all children unconsciously drew volcanoes or mountains—natural features with similar characteristics to hills—in at least one of their drawings despite the instruction on the earthquake response.

If we now turn to the cultural aspect, the result shows that strong social cohesion in a community helps children improve their learning on the disaster. Of seven children who show the greatest increase in learning, six children were raised in communities with average to strong social cohesion, and only one child's family has a weak relationship with their neighbors. The family of a child who shows no improved knowledge demonstrated low social cohesion with the community. It suggests that ethnicity and culture influenced the children's level of learning. The strong and average social cohesion were reported in the form of active involvement of the Rukun Tetangga (RT) and Rukun Warga (RW) leaders in community affairs and the high frequency of community activities in the neighborhood.⁴ This finding further supports the idea of Prayudi et al., (2017) about the tradition of *ngariung* or "to gather" in Sundanese culture, which contributed to the dynamic network among citizens. This finding is also in agreement with Hishida & Shaw's (2014) finding, which showed that social capital—including networks and trust, according to Putnam (1993)—is a glue that holds societies together. The excellent relationship creates a healthy ecosystem in the neighborhood where knowledge and information exchange takes place among residents, including children. Furthermore, the low social cohesion reported is related to the length of residency and the discomfort of socializing with neighbors due to cultural and belief differences.

In the final factor, religious values importantly affect the level of learning of the majority of the children. At least five children with the greatest increase in learning and one child with no improved knowledge were taught religious values for mental preparation, and only one child with the greatest increase in learning was taught physical preparation. The mental preparations include but are not limited to "surrendering life," "being patient" and

⁴ In Indonesia, there are administrative divisions on the neighborhood scale. The smallest administrative unit is called RT which govern around 30-100 households—depends on the area. While the bigger unit is called RW which govern around 3-10 RTs. RT and RW are not under the formal governance bodies, but the leaders are chosen periodically by the residents.

“asking God for protection,” while the physical preparation is more keeping the environment clean to reduce the disaster risk. The possible explanation for the result might be that the children, who were introduced to religious teaching from very young ages, had developed a mindset that God is the most potent figure who determines every affair in the whole universe, including the happiness and suffering of humans. By believing that everything is already “written” as fate and having unconscious religious coping for critical life events (Krok, 2015), the children possibly have a more relaxed attitude toward disaster, which influences their comfort and abilities in absorbing new knowledge.

6 | Conclusion

The main goal of the current study was to analyze the potential influence of the background factors on the children’s level of learning. The results showed that the 5-6 children with the greatest increase in learning were raised by skilled mothers, have high dialogue intensity with the parents, live in unsafe areas, are surrounded by a community with strong social cohesion, and were taught religious mental preparation for disaster. Overall, these findings suggest that the background factors potentially influenced the children’s level of learning about disaster where the best scenario for achieving increased learning about disaster is through the good communication of skills and knowledge to the children, the presence of a threat, and the existence of psychological support from the community and a spiritual connection. These results provide further support for the hypothesis that the effectiveness of the DRR program depends on the backgrounds of the children, which are economic conditions, education level, living environment, ethnicity and culture, and religion.

In order to continue to explore how knowledge of these background factors can make DRR efforts more effective, future studies are therefore recommended, especially on the permeability of each variable of the background factors to the increased learning.

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Figure

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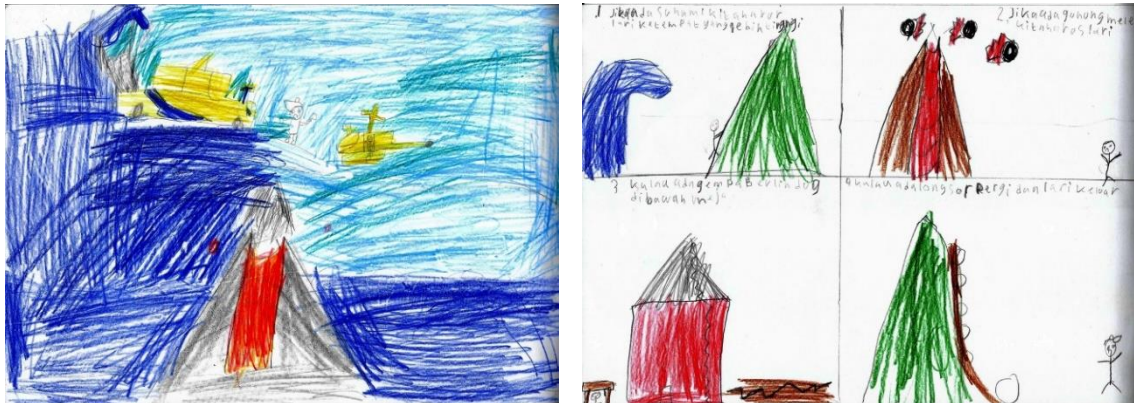
Annexes

Raw data from the pre- and post-assessments, and interviews

Pre-assessment drawing is in the left, while post-assessment drawing is in the right

Student 1

Assessments



The first drawing is about a considerable tsunami which was triggered by a volcano eruption. Student 1 is not too expressive, but he can explain things clearly, even though there were several doubts during the explanation. He explained that "...the volcanic lava touches the ocean, then the water goes up". In the drawing, there is a car that is carried away by the tsunami wave. "...the car's tires are 'stop.' The passenger is out from the car, rescued by the helicopter. After the rescue, there are many ashes in the sky (from the volcano)." Unlike in the pre-assessment, in the post-assessment Student 1 drew four types of natural disasters in boxes, accompanied by a short explanation in each box. The first box (upper left) is about the tsunami. There are blue waves and a green mountain. The description written in the box says, "if there is a tsunami, we have to go to the higher ground." The second box (upper right) is about a volcano eruption. In the case of a volcano eruption, he wrote, "we have to run." He clarified that people need to avoid the rocks and the lava thrown from the volcano. The third box (bottom left) is about an earthquake, along with the cracked ground and house. He wrote that people need to "take shelter under the table" to avoid the fallen things due to the quake. The last box (bottom right) is about a landslide. He wrote, "we have to go and run to the open field to avoid being chased by the (sliding) rocks."

Interview summary

The interviewee is the mother of Student 1 (eight years old). She is currently living in her own house with Student 1—her only child—and her father (Student 1's grandfather) in a housing cluster in Cipatik Village in Bandung Barat Regency. They have been living there for two years. She studied until senior high school, while her father is a technical high school graduate. She makes a living by making and selling doughnuts. She used to work in a textile company, but she quit since October 2018 because there is no one to take her son to and pick her son up from school. Once a week, she goes to another city to do shopping, sell her doughnuts, or do other business. She thinks that she will continue her doughnut business or conduct trading at the market if her activities have to be temporarily stopped due to a disaster.

Her house is located on a higher ground than the other homes in the area. There is a paddy field and a river next to the house, but it never overflows. Considering the existing hills in the surroundings, she thinks that the area is prone to landslides. The road inside the cluster is well-paved, but the access to her house (outside the cluster) is full of stones and is muddy in the rainy season because it has not been paved yet. She said that the developer has been working on the road for seven years, but never finished it. She admitted that the house is remotely located due to the inexistence of public transportation that passes by the area. The area is quite dense with buildings and small alleys. There is an open field that is usually used by the kids to play football. Also, *pasar tumpah* sometimes occurs in the street.⁵ The RT leader is active in gathering people and does community works, even though she thinks that the leader is money-oriented.

She has a terrible experience with wind. Around six months ago, a strong wind blew away her clay kitchen roof tiles. She said that it is common to experience strong wind in the rainy season. She is aware that Bandung metropolitan area is prone to earthquakes due to the soil movement. "The soil moved the houses in Pangalengan.⁶ There are also landslides," she said. She also mentioned the annual flooding in Baleendah and the existence of Lembang Fault. She said that her area might be safe (from earthquake) due to the distance from the fault.⁷

She is a member of a youth-based CBO that usually holds charity activities and fundraising. She told the author that once she was asked to go to Banten for tsunami

⁵ Pasar tumpah is an Indonesian term for the non-routine market and trading activities that happen in the street. Usually, it occurs at the weekend.

⁶ Pangalengan is one of the sub districts in Bandung regency.

⁷ Baleendah is one of the sub districts in Bandung regency.

relief efforts—even though they were canceled—and explained to Student 1 about the condition of the tsunami survivors, especially children, that need help. “They lost their parents, have no clean clothes...” she mimicked in the way she explained the condition to Student 1.

Stubborn and enjoying debate, Student 1 sometimes asks questions about disasters that she admits are challenging to answer. Student 1 once told her that he would not be able to swim in a big wave (tsunami) after watching the news on the television. She explained to Student 1 that Bandung is not prone to tsunami, which made Student 1 feel relieved. Also, if she felt overwhelmed with the questions, she asked Student 1 to pray to ask for protection from God and ask the questions to the teachers at school to find better answers. The interviewee thought that introducing disaster knowledge to Student 1 is essential for his survival. For her family’s preparedness, she put all the vital documents in one place and secured her asthma medication.

She is a mixture of Javanese and Sundanese but was born and raised in West Java.⁸ She thinks that being polite is the most important cultural aspect that she teaches to Student 1. In Islamic teaching, she said that “everything that Allah has given to us— either disaster or whatever, we need to face them even though it is difficult. There must be something good (behind the bad things). Moreover, be patient.” For her, it is crucial to balance teaching the cultural and religious values to Student 1 because she said that one day he has to go and take care of himself.

Student 2

Assessments



⁸ Indonesians always refer Java to either Central Java, Special Region of Yogyakarta, and East Java, but not to West Java.

Student 2 told a story about Anak Krakatau in the Sunda Strait. There is red lava out from the volcano, then the tsunami appears and “approaches the Sunda Strait.”⁹ In the tsunami wave, there are grey elements, and he clarified that it is “the ashes that come in contact with the water, freeze, and are carried away by the water,” In the sky, there is a helicopter that is “witnessing the disaster.” He said that the house (on the right side) has not been touched by the tsunami, but it will be destroyed if it is. There is a rainbow in the sky, and he said that it is raining. In the post-assessment, Student 2 drew Krakatau volcano. He said that “this is the big Krakatau, the ancient Krakatau when the Anak Krakatau did not exist yet,” The lava then approaches the houses (on the right side) and makes the houses burnt. He said that people tried to seal the volcano’s crater, but they died instead because of the lava. The birds also died because of the volcanic ashes. The ashes go up into the sky and turn the sky to grey.

Interview summary

The interviewee is the mother of Student 2. She is a housewife. Student 2 is her first son, and she has a second child who is still in a kindergarten. She is a Sundanese, but the family speaks Bahasa at home. She said that the people in her living environment speak the inappropriate intonation of Sundanese and she does not want her children to speak the same.¹⁰ As for the children, she teaches them to keep good ethics, manners, and politeness, especially when interacting with older people.

Before she got married, she used to work for one year in an export and import division in a goods trading company. She has a diploma in Japanese literature from STBA Bandung and used to have a dream of studying abroad, but she has no money to realize her dream. She also has experience working in a chicken farm home industry in Shikoku, Japan for one year. She said that she used to teach Student 2 Japanese when he was a child, but he did not have an interest at that time. “Now, he starts to build interest (in Japanese) and ask the Japanese version of simple expressions, like “I am home,” explained her.

⁹ The Sunda Strait tsunami was the tsunami triggered by the eruption of the Anak Krakatau volcano, which is located in the strait between Sumatra and Java island. The tsunami was alleged to be “the silent tsunami” by the experts because it was not initiated by earthquakes and had no warning. The tsunami happened in December 2018 and affected communities in both islands. The news became national headlines for several weeks.

¹⁰ Sundanese has different kinds of intonation: the harsh or inappropriate intonation (usually spoken with peers or among uneducated speakers), the normal intonation, and the courteous intonation (usually spoken to the older or the respected persons).

Despite working in a disaster-prone country like Japan, she admitted that she did not get any information about disaster from her employer. However, she experienced two earthquakes during her stay there. She recounted that Japanese people could manage their attitude during a disaster. “No panic,” she said. Their calmness might be affected by their high level of preparedness and their qualified building equipment, such as emergency buttons. She said that she often tells the children about her experience in Japan, which motivates them to study there.

One of her excellent impressions of Japan is the citizens’ good habit of keeping the environment clean. She sees that it is difficult to tell people not to litter in Indonesia, so she tried to create the culture within her household. “I always told my children to keep their waste in their bags or carry small plastic bags,” she explained. She also regretted that the small stream close to the school was filled with trash. She said that it is the responsibility of the residents who throw the garbage in the stream. She said that the factory had guarded the stream on the other side, so people do not throw garbage there anymore, but she does not know about the stream close to the school.

She rents a newly built 21 sqm house in a gated area and lives side by side with five similar houses. All six houses have two shared water tanks into which the groundwater is pumped. She is new in her environment, so she does not know her complete address and the surrounding area. “In Jati area, if I am not mistaken,” she said. She does not know her RT leader because she did all the administration procedures via the house owner. She thinks that she and the other renters will never be involved in community activities due to their non-permanent status. “Only people who own the house are usually involved,” she said.

In order to reach her house, there is only one small unpaved and muddy alley that can only be accessed by motorbike. She said that outside her living area is like slums, and has a high density of settlements and home industries. She mentioned a paving block small industry close to her house. “Not everybody is aware about cleanliness,” she explained. She said that some people still litter everywhere. She knows that at least three households in front of her house make a living as plastic ragpickers. She admitted that the rags are not smelly because she thinks that they take the clean plastic rags home and pack them, but they often put the rags along the way to their living area. She is aware of cleanliness and so she talked to the house owner about where to dispose of her household’s garbage. The owner asked her to leave the garbage in front of her house, and he/she will take the garbage. The owner charged her 30,000 rupiahs (around 1.9€)

per week for the service. She admitted that she has no idea where the owner throws the garbage at the end.

Before she came to Jati, she used to live with her parents not far from the area. She moved to Jati because the area is closer to her husband's workplace and Student 2's school. She wanted to cut the fare cost because Student 2 and she can walk to the school. She can also access public facilities easily, such as the traditional market, police station, public medical center, and clinic while the closest hospital is approximately four kilometers from her house.

Her husband works in one of the subsidiary companies of the textile factory Gistex. He usually stays at home during the morning because he works afternoon and night shifts in the laboratory. "Sometimes he works overtime," she said. With that work schedule, she said that her husband does not have so much time with their children. "He sometimes has to go to work on Sunday," she complained. Even if he does not need to go to work on Sunday, he will stay at the house all day due to exhaustion. Nonetheless, she is grateful that her husband still has time to help Student 2 with school assignments.

She admitted that she and her husband never discuss disaster with Student 2 on purpose. They will start to talk if Student 2 asks questions about it. Student 2 usually asks after he watches the news on the television or receives information or a subject about disaster at school. She reported that once the teacher asked the class to develop a scrapbook about disaster and Student 2 decided to collect paper news about volcano eruptions. Her husband usually responds to Student 2's questions about disaster, while she—as she admitted—does not know much about the latest information since she become a housewife. Her knowledge about disaster and disaster responses usually comes from the television and the internet—as does Student 2's. However, Student 2 likes to read too because the school gives the students easy access to borrow books. She thinks that the book lending program is useful for reducing screen time for Student 2. She also reported that Student 2 rarely plays outside. Despite attending TPA every day after school, except Friday, Student 2 never plays with his friends. "After the TPA is finished, he goes directly back home," she said.

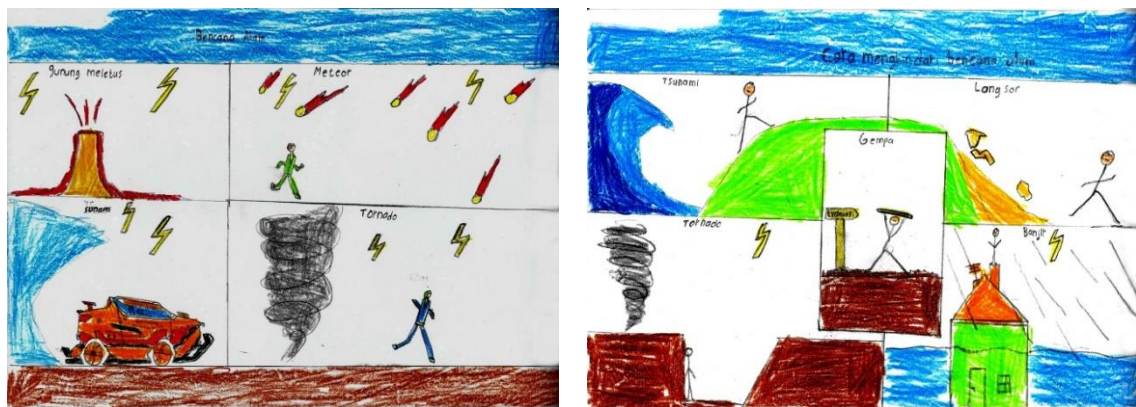
She thinks that her living environment is safe from hazard because she has never experienced a hazard there. However, she has experience with an earthquake at her parents' house. It was an aftershock in the Pangandaran, a coastal area in the southern part of West Java, in early 2018. "It was 11 pm. The quake shook the beds," she recalled.

She immediately went out of the house because she worried that the old house would collapse. She recalled that her neighbors were still inside the house because they did not realize the threat, and people started to shout, “There is an earthquake!”. She said that she was afraid of the aftershocks, so she decided to stay outside for some times.

She thinks that it is essential for disaster knowledge to be transmitted to the children because she never knows when disaster might strike. She even said that she and her extended family had started a small business together for their provision in the future, including when disaster strikes and affects their primary income sources. As a Muslim, she also holds onto what is written in The Holy Koran about disaster management, rather than believing myths which commonly appeared before and after the disaster.

Student 3

Assessments



The title of Student 3’s first drawing is “Natural Disasters.” He drew different types of hazards in this drawing: volcano eruption (upper left), meteor (upper right), tornado (lower right), and ‘tsunami’ (lower left). In the meteor and tornado boxes, some people run, avoiding both hazards. In the volcano eruption and tsunami boxes there are no people, but there is a car being chased by the high latitude wave of the tsunami. All of the four stories have lightning in the drawing. Similar to in his pre-assessment, in his post-assessment he drew a comic-like drawing. This time, the title is “How to avoid natural disasters” and it has five different types of hazards and how people respond to each hazard. Each box has the title in it. The drawing in the upper left is about tsunami. Some people climb to higher ground to avoid the wave. In the upper right, there are landslides and people avoiding the slides by running to a safer place. In the lower right, he drew people who are on the rooftop of the house in order to stay above the rising water levels. The house is floating, and he said that the flooding is due to the heavy rains. In the lower right, people are hiding in the lower ground in order to avoid being carried

away by the tornado. The last box is about an earthquake where there is a man covering his head with a bag to avoid the buildings' rumbles and heading to the evacuation center. To his knowledge, the evacuation center is the "safe place; an open space."

Interview summary

The interviewees are the parents of Student 3. They have three children; the first and the second child are in university and secondary school respectively, and Student 3 is the youngest. They own a house in Nanjung village. Beforehand, they lived separately—the father of Student 3 has been working in Bandung for some time, while the mother lived in Brebes, Central Java. They moved to Nanjung together in 2002 because the mother of Student 3 was assigned to work in the village.

She is a midwife who works in a public medical center from 7 am to 3 pm, then continues practicing at home in the afternoon. She holds a diploma in midwifery from health schools in Brebes and Cimahi, West Java, while her husband holds a diploma in forestry from Universitas Winaya Mukti in Sumedang, West Java. Student 3's father worked in the forest industry in Borneo before he built his own construction company. He said that, legally, his office is his house. However, if there is a construction project, the consortium of five companies—including his company—will rent a building close to the site to manage the project. If there is no project, he mostly stays at home.

With both working schedules, they have more time to interact with their children. The father said that Student 3 likes to ask their help to check his school assignments. "He also likes to tell us about his activities at school," said the mother. She said that Student 3 usually tells his parents the exciting activities he did at school, such as disaster education and a drill some time ago. In addition, he also gets information about disaster from the television even though, as his parents observed, he does not have too much interest in it.

Both of Student 3's parents are from Brebes. The mother found a fundamental difference between the Sundanese and Javanese lifestyle. "We always taught that having a roof over our head is the number one priority," said her. "While here, people seem to prioritize the outward appearance," she added. They said that their parents would be upset if they were to prioritize their own vehicles, clothes, or jewelry rather than owning a house. They said that most of their neighbors are migrants and have their own businesses, such as sock production.

On the other hand, the native inhabitants tend to sell their land and move to the area where the land is cheaper than the other areas. “They sold their houses, get the money, and buy other things, such as a vehicle, while their businesses are still unstable,” explained the father of Student 3. As far as he observed, the native inhabitants tend to move a lot due to their lifestyle.

Generally, their relationship with their neighbors is good. They consider both the RT and RW leaders in their area as active in gathering residents once a week, especially currently, while the community mosque is under construction. The mother of Student 3 also added that the community health check-up is routinely held once a month. However, there is one thing that bothers the family. There is a jeans washing industry in their neighborhood that used coals to steam the jeans. The residues from the coal polluted both the air and the surfaces (of people’s houses). “When they turn on the machine, the smell of the coal is powerful!” the father of Student 3 complained. He said that the pollution level at their house depends on the wind direction—if the wind blows to the other side of the neighborhood, they will not smell anything.

Beside factories and industrial areas, they mentioned that a futsal arena is the closest sports facility in the area. There is also a vacant field owned by the factory which is not designated for sports, but the kids sometimes use to play soccer. They like that their house has easy access to almost everything; toll road—so they can travel to Brebes easier, city center, public medical center, traditional market, police station, mosque, and two private hospitals. The Citarum river and a two-meter full drain that can contain rainwater are both close to the house, so the area has never flooded. The father of Student 3 said that the area is safe from flood because it is the highest point in the area. He said that the area is also safe from tornado and landslides.

The father of Student 3 is aware that there is a Lembang Fault that could potentially make Bandung collapse. He knows it previously from the history and geology lessons he had when he was a student, and it has become the most talked issue in Bandung. He also heard from the local elders that if the ‘safety belt’ of Bandung is broken, there will be an earthquake. He considered Lembang as close to his house, so their neighborhood will be affected. He mentioned Mount Tangkuban Perahu, which was recently active as well and the deforestation in conservation areas in the northern part of Bandung city.¹¹

¹¹ Tangkuban Perahu is an active volcano located in the northern part of Bandung metropolitan area—close to the Lembang fault. The volcano, with a shape resembling an inverted boat, is well-known from its associated folklore about Sangkuriang and Dayang Sumbi which has been told for generations. The volcano

“The area is supposed to be the water catchment area, but it is mostly built now,” he added.

The family experienced an aftershock from the seven-magnitude earthquake in Tasikmalaya. They felt the tremor, but it did not cause falling things. “It was midnight, and we went out of the house!” said the father of Student 3. Having that experience, they always told their children, who all sleep upstairs, to be always alert, not sleep too soundly, and not lock the door. The reason is that they experienced difficulties waking their children up. Thus, the family thought to build a concrete box inside the house as their emergency shelter. “It is difficult to leave the house—you have to unlock the key, wake up your children, and so on. We think it is better to build shelter inside the house, so we do not need to go out,” explained the father of Student 3. However, the plan has not yet been realized because he needs to think carefully about the design, the size, the material, and the location.

As an experienced construction worker, the father of Student 3 admitted that his primary consideration in building his house is the cost. “I did not calculate in detail what magnitude scale this house can endure. I build according to the minimum standard,” he explained. Based on his analysis, the minimum standard building can tolerate less than a seven magnitude scale earthquake. “The anti-earthquake building system is expensive!” he exclaimed. He also found that most people in his surrounding area are courageous enough to build more than one story houses with below-standard materials, let alone the earthquake resistant standard. Most of them also build their houses by themselves and not using certified construction workers’ service, in order to cut the cost. “If there is an earthquake, most of the houses here will be affected,” he concluded. He observed that some people are too complacent and do not make any efforts to prepare themselves for an earthquake.

Both of them admitted that they have not received information about disaster and disaster responses in the area. “We only know from the public service announcement on television,” they both said. They also have not delivered the information to the children because they doubt their children’s ability to comprehend the message. Nonetheless, they said that their children know that running out from the house is the first response for an earthquake. “Student 3 knows it from the fire drill content shown in the cartoon series,” said the father of Student 3. The mother of Student 3 also realized that the family

is the remnant of the past more significant volcano eruption in the area. It is now one of the most visited tourist attractions.

members might not be together during the event, so it is essential for each member to know how to rescue themselves. Additionally, the parents also try to teach the children the primary attitude toward facing disasters based on Islamic teaching, which is to be patient and not place blame. “Disaster is a warning (from God),” added the mother of Student 3.

The father of Student 3 imagined that if an earthquake happens and affects his previous project due to construction error, then it will be his responsibility as the contractor to fix the broken building, while his wife, a civil servant, said that she would wait for the government’s instruction as to future steps. Earthquake and other natural disasters will affect neither their jobs nor their income.

Student 4

Assessments



Student 4 drew mountains, street, sun and clouds in her first drawing. Due to her shyness and unwillingness to explain her drawing, the author needed to ask close-ended questions to her. She nodded when she was asked, “is it a volcano eruption?” From the drawing, it seems that there are grey fumes at the top of the volcano. In the post-assessment, Student 4 was more open to explaining the drawing. Here, she drew two types of hazards: the earthquake (on the left) and the volcano eruption (on the right) along with a title in each situation. In the earthquake situation, she showed a girl covering her head under the table, while in the volcano eruption drawing, there is a mountain with red fire, lava, and fumes. She said that “the lava comes out from the fire,” There are also several red elements scattered in the sky and she said that they are “the bombs” that come out from the volcano. She clarified that she drew the down arrow to show the girls to run down to save themselves. She said that the eruption occurred in the evening when the sun almost goes down—that was why she colored the sky with orange color.

Interview summary

The interviewees are the parents of Student 4. Student 4 is their first child, and they have two other younger children. Both of them are Sundanese and speak Sundanese at home, except to the children, to whom they speak Bahasa. As Sundanese, they know that there is some wisdom or myths related to the environment or disaster. However, “They are only discussed in the rural area, not here in the urban area,” said the father of Student 4. The spreading of the myths is unavoidable in Student 4’s circle of friends, but her mother always tried to explain the phenomenon logically. “I do not want her to believe in the myths,” she said.

The family lives in a house inside a cluster in Lagadar village—around one kilometer from the school. They have been living there since 2011. Beforehand, they lived in Cicadas, Bandung city—the house of the grandparents of Student 4. They moved to Lagadar because of their jobs. The mother of Student 4 is a teacher at a primary school, while the father, who has a chemistry background, is a freelancer in a water drinking company.

The village is a densely populated area. The family easily accesses the public facilities, such as mosque, traditional market, and businesses. There are no public health facilities inside the cluster. However, there is a clinic, private hospitals, and public medical center located not far from the cluster. There is a 5-meter full river stream behind the cluster which is located below the surface of the cluster. The cluster is safe from flooding, but the access to the cluster is always inundated.

The father of Student 4 said that he experienced an earthquake at least twice a year there. “They were the aftershocks from the earthquake at the south coast of Java,” said him. He confessed that he was panicked during the event. He did not have much time to leave the house because he needed to evacuate his children first. Fortunately, the tremor was light and only for a moment. He realized that he should not be panicked during an emergency.

As long as he has lived in the area, the neighborhood leaders have not organized any disaster education or simulations. He only has experience attending mandatory fire drills from his previous work in a processing industry company. From experience, he knows that he needs to go out of the house to the open field if there is a fire, as well as an earthquake.

The father of Student 4 knows about the Lembang fault and its consequence to the city. Nonetheless, he did not put effort on specific preparation for the earthquake yet, such as the emergency bag. Both of them observed that Student 4 knows about the disaster, but has not understood much. Besides the television, her friends usually tell her about the news. She also gets information from the books and the schools. Student 4 never asked about disaster to her parents, except when they started the conversation about it. Usually, the mother tried to explain about the disaster in a simple way so Student 4 could understand. She explained things close to their environment, such as the Lagadar hill behind their living area. She heard that the hills are privately owned and thus being excavated for profit. The hills were still virgin when the family first came into the area. Now the sand of the hills has been excavated. She showed Student 4 the hills while they passed it by motorbike. "I told her that one day there would be landslides because the hills are exhausted," said her. However, she avoided explaining more complicated things about disaster because she thinks Student 4 will not understand. She can feel that Student 4 is not satisfied with the explanation, and she keeps asking questions. "Sometimes when I feel tired (and do not explain more), she is upset," she said.

Student 5

Assessments



The first drawing is about a tsunami. In the picture, there is a colorful car in the street. There is also rain, clouds, and the sun which is hiding behind the clouds. There are no people in the drawings. The student explained that "the car is traveling and then it is chased (by the tsunami). It rains." When he was asked why there are no people in the drawing, he was thinking for some time, then explained that "people are running," and that he is driving the car. He was a little bit shy, but he wanted to say things when triggered or asked. However, he could not explain why the sun is hiding. The second drawing is a mixture of three types of hazards: earthquake, volcano eruption, and

landslides. In the drawing, there is a tall brown mound—labelled “volcano”—with green features that the student called “the trees” on the surface of the volcano. There is collapsed ground on the right side of the volcano. At the volcano’s top, there is a large red element and several small red elements with black tails hurtling toward the green field. The picture shows three people in the green field, colorless clouds, the sun—which is not hiding behind the cloud anymore—and three green birds. The student explained that “there is an earthquake, then another tremor comes that resulted from the erupted volcano, and the landslides.” The small red elements with black tails are “the meteors.” He explained that one of the people in the drawings is “enjoying ice cream when the lava (from the volcano) comes” and the other person is scared—and they run to the right. The person in the left falls because of the tremor. The student said that the event occurred in the morning.

Interview summary

The interviewee is Student 5’s father. He and his wife are from the Bandung Regency. He studied until primary school, while his wife is a secondary school graduate. He works in a textile factory behind the school from Monday to Friday (8 am – 4 pm) and Saturday (8 am – 1 pm). Sometimes he works overtime until 10 pm. His wife works in a garment factory in Sukabumi and visits the family once a week.¹² Student 5 spent most of his time with his grandmother at home. In the view of his father, Student 5 has a lack of confidence. Student 5 is eight years old, and he has a younger sibling who is four years old.

The family has been renting a house in a housing cluster in Kampung Cipatat for almost two years. The school can be reached with a 10-minute walk from the house. The environment includes mild weather, a crowded population, and a remote location — the access to the house is only for motorbikes. The closest market, clinic, and hospital can be reached in 10, 15, and 30 minutes by motorbike, respectively. For daily needs, water is pumped from the ground to the upper tank. They have two shared tanks for ten houses in the cluster. There is a cassava farm behind the house owned by other residents and an open field near the home used by the residents to play football and hold local celebrations. There are also hills surrounding the area which have been excavated for building materials. “The hills are exhausted,” he observed. He realized that there had been many changes in the area. “It used to have lush greenery, but now it has turned into the textile factory,” he said.

¹² Sukabumi is a regency in West Java.

He said that the factory was built by piling up the land. The factory management has been trying to buy the surrounding land from the residents to widen its working area. Those whose property was purchased were moving to another zone. Due to the proximity to the factory, the odor from the wastewater is a little bit disturbing for the interviewee. However, he likes the kinship in his neighborhood. His son (Student 5) loves to play with the neighbors' children.

In his environment, the RT and RW leaders have not discussed the potential for natural hazards in the area yet, but he acknowledged that the RT leader is needed for administrative matters. He had never heard about the Lembang Fault, but he is aware that the Mount Tangkuban Perahu volcano is an active volcano. He believes that if the volcano erupts, his living environment will be affected. So far, the interviewee has never experienced significant shocks or hazards in the area. Thus he thinks that his living environment is safe from any risks except an earthquake. His experience with the earthquake occurred a month ago when he felt a light tremor. Hence he only prepares himself by knowing to run because an earthquake usually comes suddenly. He also said that he has no alternative work or skills to generate income should natural hazards affect his workplace or jobs.

Also, he knows information about disasters mostly from television and social media. He said that once Student 5 wanted to know more about tsunamis after he watched the news on the television. He admitted that he is confused about what to explain because he has never experienced one himself, but his wife responded by showing videos on YouTube. He agreed that transmitting knowledge about natural hazards to his children is essential—if he knows the knowledge.

The language spoken at home is Sundanese, but he speaks Bahasa to the children. The reason why he does not introduce Sundanese to his children is that he worries that he will accidentally transmit the inappropriate intonation of Sundanese. He has no values from his cultural background related to the environment or natural hazards. However, he emphasized to Student 5 that he should respect elders and be friendly and polite in daily life even though there are no more respected elders or cultural leaders in his living environment. In his Islamic religious view, he was taught to receive fate and be resilient should disaster happen. He insisted that religious values are more important for his children than cultural values. Hence he registered Student 5 to a TPA from a very young age.

Student 6

Assessments



The drawing is about a volcano “explosion”—his word for “eruption.” “Natural disaster” is written under the volcano. In the middle of the ground, there is a road. On the right side of the road (from the reader’s perspective), there is a car with “45” written in the window. There is a tree beside the car with one bird waiting inside the tree, and another bird flying and shouting, “Run, run,” to the other bird and humans. On the left side of the road, three houses sit on the bank of a blue Citarum River.¹³ He said that two people go inside one of the houses. Both of the people look outside from the window. Then these two people run to Student 13’s house—one of his classmates. “It is raining,” he clarified on the hiding sun behind the clouds. In the post-assessment, he drew flooding and systematically explained the reasons why the flood exists. Student 6 can also show the impact of flooding on the people and the environment. He even drew components like buoys in his post-assessment drawing, even though the DRR program by PB did not mention anything about buoys.

Interview summary

The interviewee is the mother of Student 6. She has mixed blood—Sundanese, Javanese, and Riau (Sumatra). Her mother (Student 6’s grandmother) is half Sundanese-Riau and was raised in Riau, and her father (Student 6’s grandfather) is from Purwokerto, Central Java. Nonetheless, she cannot speak Javanese. Her husband, meanwhile, is from Java, but was raised in Bandung. She confessed that Sundanese are well-known as “people who will act and prepare once the bad things happened.” However, the important thing she always emphasizes to her children is to be polite, friendly, and respectful to the elderly.

¹³ Citarum is the longest and largest river in West Java that pass by Bandung metropolitan area.

She used to work in Gistex—the textile company in her area, but now she is a housewife. She has a vocational school education with a specialty in business management and marketing. She has three children, and Student 6 is her second child. Her husband works in a textile factory in Majalaya Sub District, approximately 50 kilometers from where they live. Her husband has to leave at 6 am and gets back at around 7 pm daily. Her husband also used to work in Gistex for six years. He was an intern there while he was studying textiles at Universitas Bandung Raya, after which the company recruited him as an employee. Then, the management rotated him to work in Purwakarta branch, so he decided to resign after ten years of work. He then started to work in another textile factory closer to their house and has spent two years working there.

Her husband told her that he does not want to work in the factory forever. He wants the family to start a business. Her husband asked her to learn to cook in one of the most well-known cooking academies in Bandung, but she has not started yet. She said that her husband wanted her to be able to earn her own money once he decided to quit the factory job. She acquired entrepreneurship skills from her mother, who ran a cake production business since she was a child, and she thinks that Student 6 also has the skill. Currently, Student 6 and she are routinely selling healthy snacks during Entrepreneur Day at school. Student 6 also sometimes asked her to bring snacks to sell when he was in TPA in the evening. She said that she wants to start her own business, but she needs to take care of her youngest child. She thinks she will be more focused on it once her youngest child is at least primary school age.

Due to his work's location—prone to flooding and affected by heavy traffic on the way, her husband sometimes arrives at home late and has a little chance to interact with the children. She said that her children would automatically know that there is flooding when their father comes home late. Based on her husband's experience, she then explained to Student 6 that flooding is caused by littering or people who do not throw garbage away at the designated place, for example in the river. Her husband also contributed to the children's knowledge building by showing the kids the flood-prone area close to his workplace. There he explained that when the drain cannot handle the rainwater, then there will be a flood. Student 6 has also experienced flooding due to a broken dike at his grandfather's house close to an irrigation system in Cilacap, Central Java. As a kid, Student 6 still did not understand about flooding and had fun playing with the water. She told Student 6 about the consequences of playing in dirty water that can cause diarrhea or skin diseases.

She and her husband live in a house in Cimahilir, but currently stay in the house of her late parents in Utama Sub District. She stays there because it is easier for the family to access public transportation from Utama to Student 6's school. Sometimes she goes back and forth between the two houses. She has been living in her Cimahilir house for one year, and she admitted that she does not know her neighbors well.

Her house in Cimahilir is situated in a hilly area. She testified that the hill had been excavated by bulldozers until it was half of its original size. The excavation is massive—it was happening all day and night. She is afraid that there will be landslides due to the practice. Even though the hill is being excavated, there are still trees on the hill, and the climate is still pleasant. Her children often complained that the surrounding areas are 'empty'—mostly bamboo forest and paddy field. "They are afraid to pass by the bamboo forest, especially at night," she said amusedly.¹⁴ However, she said that today's generation is different from her or the older generation—they do not believe in urban legends and myths so much, and are more interested in logical explanations.

She had experienced an earthquake when she still lived with her parents. It was in 2007 or 2008 when everybody was inside the house. "Suddenly, my dad asked everyone to go out from the house to the open field," she said. At first, she knew that there was an earthquake happening from the shaking lamp. Since then, she has always warned Student 6 to go outside when he feels any tremors and not be inside a house. She said that Student 6 recently experienced an earthquake in his relative's house. The tremor was light, but he was shocked and directly went back home after the tremor was finished—as his mother told him. She also told a story about how a two-story boarding school in Cikuya, close to her house, was slowly destroyed by an earthquake—which was an aftershock of the Sukabumi earthquake. She assumed that the quality of the building that collapsed was terrible.

Student 6 knows information about disaster mainly from the television, and sometimes from social media. He usually shows his empathy by commenting on people who forcefully stay in emergency tents, "Mom, look at the survivors. Poor them," he said once. So she said to Student 6 that, as Islam teaches, it is helpful for people to give charity to the survivors to ease their burden.

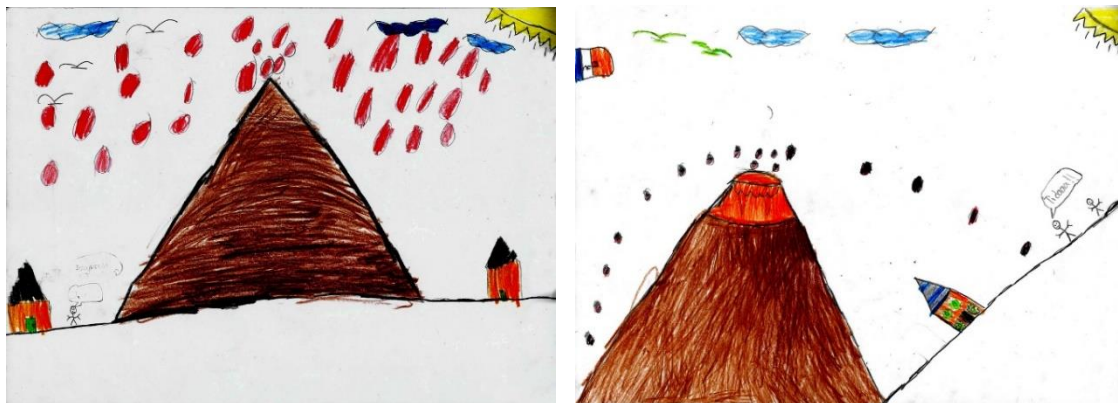
She acknowledged that it is essential to provide knowledge about disaster to Student 6 because she is aware that Bandung is prone to the tornados, landslides, and volcano

¹⁴ Many Indonesians believe that bamboo forests are home to ghosts or unseens.

eruption. “Cisarua was submerged by the landslides lately,” she said.¹⁵ She hopes that there will be more disaster education campaigns in her area because she observed that campaigns had not yet reached her area.

Student 7

Assessments



The drawing is about a volcano eruption. There are a lot of small red components above the volcano that Student 7 called “the rocks.” He clarified that the rocks are red due to contact with the fire (from the volcano). There are two houses beside the volcano. He said that one person in the left wants to escape (from the eruption) to the house. There are also the sun, clouds, and the birds in the drawing. “The birds are supposed to fly to the volcano, but when they see the rocks, they turn back the other direction—to their nests,” he explained. Again, Student 7 drew the volcano eruption in the post-assessment. The volcano is colored brown because “it supposed to have trees, but the trees were cut down,” he explained. He claimed that the orange part at the top of the volcano is “the lava.” On the right side, there is one house, and two people who want to go higher ground shout “Nooo.” They go to the higher ground because they want to avoid the rocks from the volcano. Similarly to what he explained in the pre-assessment, the birds are scared (of the eruption), so they fly back to their nests. “The eruption happened in the afternoon,” he said.

Interview summary

The interviewee is Student 7’s mother. Student 7 (eight years old) is her oldest son, and she has two other sons who are six and 1.5 years old. She studied until senior high school, and so did her husband. She is currently a teaching assistant at a kindergarten and works from Monday to Friday, from the morning until 11 am. Her husband works in a furniture factory from the morning until 5 pm. In addition, her knitting skills help her to

¹⁵ Cisarua is a sub-district in Bandung Barat Regency that is one of the areas passed by the Lembang Fault.

get a non-routine additional income by making crochet and other products. Meanwhile, her husband—thanks to his current jobs—has developed skills related to electricity and welding.

In daily life, her husband usually takes Student 7 to school on his way to work, while she picks Student 7 up in the afternoon. After work, her husband takes Student 7 to the TPA. Then, both of them help Student 7 with his school assignments after the TPA schedule. The interviewee and her husband are Sundanese. They communicate in Bahasa at home because the mother cannot speak proper Sundanese. She tried to talk in Sundanese, but she worried that her intonation is inappropriate and she does not want her children to realize that. Her husband can speak a more proper Sundanese.

They have been living in the housing cluster of Mekarwangi in Patrol neighborhood for seven years. There are only 40 households inside the cluster. Student 7 used to interact and play with the diverse age group of neighbors—from kids to teenagers. There are no open fields inside the cluster, but there are several dead-ends where children can play safely without the risk of the passing cars. The children sometimes also play in a small room in a musholla.¹⁶

The house is strategically located because the public transportation passes by the housing cluster. Shophouses are all over the area outside the cluster. There are also a lot of vacant spaces in between shophouses along the street. The nearest village is a little bit far from the cluster, but the public facilities, especially traditional market, are a short distance away. The housing cluster is under the administration of the neighboring village's RT leader and, in her opinion, the RT leader is not active in her area at all. "We have to form our community health center, pay a regular contribution, and buy our health equipment collectively. Otherwise, we have to go to the health center which is far from the cluster," she said. She said that she could not trust the RT leader in any case, even during a disaster.

She hates the ditch in her area because it cannot handle a large amount of water and, at some point, the trench discontinues, which results in overflows and makes the road muddy and slippery. Due to this poor condition, the garbage from the market—which is located on higher ground than the housing—is sometimes carried away in the ditch. Beside the trench, a large paddy field behind the cluster also causes some troubles. "The

¹⁶ *Musholla* is a small mosque.

water (from the irrigation system) goes down to our area even though there is no rain,” she said. The house is also close to the hills called Bukit Pancir. She can reach the foothills by foot from her home. She testified that a private company had excavated the mountain for so long that the trees are gone and it almost exhausted.

She is aware that Bandung metropolitan area is prone to flooding, volcano eruption from the Mount Tangkuban Perahu, and landslides in the hilly areas, but she has never heard about the potential for earthquakes. She had never experienced a strong earthquake, only a light tremor which she thinks were the aftershocks of the Sukabumi earthquake some time ago. Her house location on higher ground and the existence of Citarum river make her believe that there will be no flood in her area because the river will drain the excess rainwater. She said that “the disaster is ‘far,’” so she never really thinks about it.

However, she has already prepared all of the family’s essential documents that people need to bring in case of emergency, like school certificates, in one place “as our identity,” she said. She also heard from her colleagues that people need to have one (emergency) bag that needs to be brought should a fire break out. She also knows how to survive an earthquake—“find shelter under the table and do not stand on the wall” and fires—“keep a wet towel in the mouth opening to avoid smoke or to lay down.” She said that she got most of the information from the internet and social media, but she never transmits that information to her children.

Similar to his mother, Student 7 also knows information from social media—the pictures in the WhatsApp group on his parents’ phones. He rarely watches television. He prefers to play outside and sometimes gets information from his friends. When the Sunda Strait tsunami occurred last year, he only asked his parents why the hazard happened.

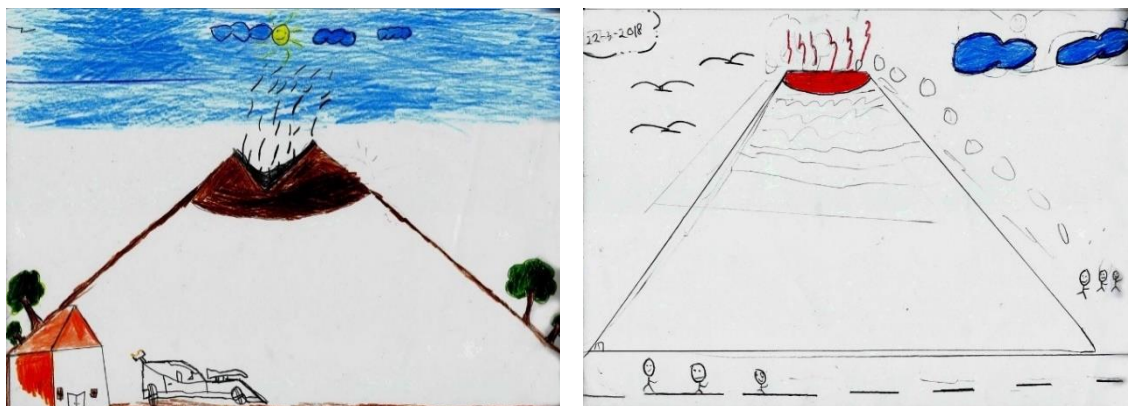
There are no specific cultural values related to the disaster that the mother holds or needs to teach to the children. However, she told the children not to feel sad if it happens. She emphasized that “disaster is not a sign of God’s wrath, but just a natural event. Accept the reality, do not give up, pray, and surrender.”

She also acknowledges the importance of combining (scientific) knowledge—such as how and what to prepare—and this attitude towards disaster. She admits that disaster education is essential for children, especially on how to rescue themselves and be independent because the hazard might separate them as a family. She hopes that there will be drills and information dissemination organized in her housing cluster in the future

because no such things have ever happened. She said that the exercise is essential not only for her in her environment but also for anywhere a disaster could occur.

Student 8

Assessments



The drawing is about a volcano eruption. There is a house downhill and a car beside the house. Student 8 was not finished his drawing, which made him a little shy when being asked about it. He said that he was about to draw people running away from the inside to the outside because the house is on fire. There are also some trees on each side of the mountain. The trees are trembling due to the eruption. There is also a hiding sun which he claimed: "... (is) sad because the sun is afraid of the disaster." He could not explain why the sun is afraid. Student 8 is quite straightforward when being asked, but he needed to be questioned first, rather than explain by himself. Student 8 drew another volcano eruption in the post-assessment. This time, he was not shy because he could explain many parts in the drawing. With confidence, Student 8 said that "Due to the volcano eruption, people are running away from their houses to the street." In the right part of the drawing, people are running, but he could not answer where these people go. He also could not explain why people run to the street. There is a house downhill (at the bottom of the volcano), but the size is much smaller than in the first drawing. Several rocks are coming out of the mountain, and he said that "people and the birds are afraid of the eruption." The birds are flying away because they can feel the heat coming out of the mountain—so can the sun, which is hiding behind the cloud. When he tried to explain the "lava," he forgot the word and just associated the "lava" as "the thing."

Interview summary

The interviewee is Student 8's mother. Student 8 (eight years old) is her youngest son of three. Student 8 has two older sisters; one of them is in the second year of university, and the other one has just married. Besides her three children, she also has two persons

living with her family; they are Student 8's cousins. Both of her cousins make a living by selling phone cards in a booth near her house. She has been living in her house since she was born because the house belongs to her parents. She is originally from Jatisari village, while her husband comes from Ciamis.¹⁷ In her daily life, she communicates with the whole family in Bahasa while she speaks Sundanese only to her husband.

The house is located in an urban village but very close to a housing cluster. There are some public facilities nearby, such as a health center, traditional market, and clinic, as well as Student 8's school. She usually drops Student 8 off and picks him up later at noon. Her late parents owned a mosque and bequeathed it to her family along with the TPA under the same management as the mosque. Besides her daily activities as a housewife, she also manages the TPA while her husband works in a textile factory behind the school.

She believes that her neighborhood is safe, from both criminality and disaster. Her neighborhood is located on high land and never once has she experienced flooding, fire, or other significant disasters. Compared to the lowland area close to her neighborhood, which always flooded, her neighborhood is safe because the stormwater flows well. However, she experienced a rare tremble, during which she and her family had to run outside the house to the nearby field. She believes that the tremble was not due to an earthquake but to an explosion of a garbage dump.

During an earthquake, her priority is to take the children to a safe place. She also thought that hiding in a safe place, such as under a table or anything with a hard surface, will save her, especially if there is no time to run out of the building. She and her husband always try to teach their children about disaster. The discussions were not always intended, so they usually used some examples regarding specific events, such as a flood. When they asked Student 8 about the flood, he answered that "he would find high ground up on the mountain to rescue himself."

The mother of Student 8 said that she gains information mostly from the television because she rarely goes out. In addition, she sometimes hears information from her surrounding neighbors when they meet. Student 8, on the other hand, does not watch television often—he likes to play outside with his friends—and he also does not stick to gadgets. She does not allow Student 8 to own a gadget yet, but he gets information from

¹⁷ Ciamis is a regency in West Java.

the television and his parents. Student 8 is open to his parents. He often asks his parents about things he does not understand immediately. "If something comes up in his mind, he will immediately call his dad or me to ask or clarify, no matter what we are doing at the moment," said the mother of Student 8.

Student 8 is an active son; he likes sports—like his mother—and loves mathematics. He wishes to become a famous footballer when he grows up. Student 8 is also active in religious-based activities. He usually spends his afternoon in TPA learning the Holy Koran and Islam. "He is good at reading the Holy Koran," said her. She confessed that it would be such a shame if Student 8 does not learn the Holy Koran since her family owns the mosque and the TPA.

The interviewee believed that Student 8 understands essential things about disasters and the cause of disasters. Once when they were going out, Student 8 saw a tall tree and said to his mother, "Mom, the tree is so tall. It is dangerous for the road users because it can fall on the cars." Furthermore, when he watched television where people cut down trees, he would say to his mother, "Mom, cutting down trees and littering can create a flood." She often tells Student 8 about the excavated hills behind the school as well. She said to him that when a mountain or hills are being excavated all the time, it will cause landslides and affect settlements in the low-lying area.

The interviewee admitted that she does not prepare anything specific for the moment of disasters. She also does not think favourably of emergency bags because she said that when panicked, people tend to run away and give no care to small things like grabbing the bag. "The most important thing is saving ourselves first. I do not care about my stuff because the priority is my family. When I am in a panic, I do not care about other stuff. If I know when the disaster will come, I can prepare the important stuff to be put somewhere."

She realized that many disasters had hit Indonesia, and she is aware that she might become a victim. However, she said that all occurrences are God's will, so all she can do is just surrender herself. She just emphasized that as a human, all she can do is try her best to avoid the disasters by running with her family and let God do the rest. This faith is what she teaches her children about disasters.

Student 9

Assessments



Student 9 drew a volcano eruption. The turquoise color in the lower part is the sea, while the blue part is the sky. Besides the volcano, there is also a red car, two people—who are friends, and a yellow, smiling sun. The red-shirted people on the left own the vehicle. The red-shirted people says, “Look at that!”, while the yellow-shirted people says, “Let us run!”. The small part that is jettisoned from the volcano is the hot lava. His second drawing is about an earthquake. The street—colored black—is cracked because of the strong quake. Then, there is a car facing the right, but the engine is off. He could not explain why the engine is off. He explained that people are trapped inside the car. When he was prompted by the author about what to do in the situation, he told her that people should “get out of the car.” He said that the quake is happening in the morning when the sky is clear. He said that he previously wanted to draw a tsunami scene, but it was difficult to draw.

Interview summary

The interviewee is the mother of Student 9. She is a housewife, while her husband works for a furniture company—handling the customers’ loans—in the city of Bandung from the morning until the night. Student 9 is the oldest and has a younger sister who is 3.5 years old. Her latest education is from a vocational school (the same level as a regular high school) with a specialty in secretarial education, while her husband graduated from a technical high school with a specialty in machinery and automotive education. Both her husband and she are originally from North Sumatra. She left Medan—the capital city of North Sumatra—in March 2004. She initially traveled to Bandung for no specific reason—just to sightsee and compare with her hometown.

The family rents a house in a cluster in Patrol area that can be reached within 10 minutes by public transportation from the school. The buildings near the cluster are dense. From

the house, she can see the hills, but the distance to the actual hills is several kilometers. There are a lot of paddy fields in the area; even the housing cluster was built out of the paddy field. The police station is close to the house, and a midwife practices inside the housing complex, but the nearest health center is several kilometers away.

The family has been living in the area for five years. Before, she resided in Baleendah subdistrict, but the access to the house was always affected by flooding. Thus she decided to move to their current neighborhood. She never experienced flooding herself, but her husband used to experience it in another area, especially on the way to his work. She feels that her current living environment is safe from hazards, even though she felt tremors when she was in the house around two months ago.

As a migrant, she emphasized the importance of learning Bataknese to her children.¹⁸ She speaks Bataknese to her children at home, informs them about *ulos*, and encourages them to go to church and celebrations.¹⁹ In terms of familial relationship, she also teaches the children to respect older people by using specific salutations for each extended family member.²⁰ She does not like it when she feels that her neighbors treat her differently because she is a minority, Christian. However, she takes the initiative to not exclude herself due to the difference because she thinks social interaction among neighbors is essential. She said that mutual help among neighbors occurs despite the differences. The RT leader is also active in gathering residents to discuss or organize local events. In the cluster, there is a mosque that can be used publicly.

She never discussed how to prepare for disaster with her family. “If I have the things (an emergency bag) at home, but the earthquake happens when I am not at home, it becomes useless.” She continued, “It is better for me to receive my fate. When God still gives me life and safety, so be it. However, when the time has come (to die because of disaster), I give up.” She said that Christianity teaches her that the only thing that strengthens her faith is surrendering herself. “Our bodies, wealth, offspring, are not ours—they are God’s. If God needs to take them in a disaster, for example, I cannot do anything. I hold on to that principle.” She tried to deliver those faith-based principles to her children, but she thinks that they are still too young to understand. So, she told them

¹⁸ Bataknese is a local language spoken in most of the North Sumatra areas.

¹⁹ *Ulos* is a traditional fabric from North Sumatra

²⁰ For Batak people, there are different salutations for each extended family members. For example, *Uwa* for the older sister of the mother, *Tante* for the younger sister of the mother, *Tulang* for the brother of the mother, *Uda* for the brother of the father, *Namboru* for the sister, and *Opung* for the grandparents.

to always be careful and on the alert. If her husband's workplace were affected by a disaster, she thinks that she would want to learn how to sew and to open a small shop to generate income. She admits that she has haircutting skill and sometimes her service is used by the neighbors.

The children know about the flooding news from the television, but she thinks that they still do not understand. They once asked, "Where does the water come from? The water is from the sea, but how can the water be inside the houses?" She could not answer the question, and she asked her husband to explain. For her, introducing disaster knowledge to her children is vital for them to be reflective and aware of the early signs of disaster—light tremor before an earthquake, for example. Disaster education is also useful for her children to be able to rescue themselves and find a safer place.

Student 10 Assessments



The drawing is about a volcano eruption. In the bottom part of the mountain, there are three hijabi girls stand between two houses in the green field. She explained that "the girls are running while crying," because they see the eruption and their houses are going to burn. There are trees on the surface of the volcano, the red 'fire' from inside the volcano, and the fume at the top of the volcano. The sun is frowning because, like the girls, "it sees the volcano erupting." Similar to her pre-assessment drawing, Student 10 drew a volcano eruption with three girls as her drawing characters. However, unlike in the previous drawing, this time she drew two mountains. The red volcanoes on the right are erupting with the fire leaping out from within; then the fire spills down to the street. She explained that the girls are camping on the hillside when the volcano erupts. "The camping equipment is burnt because of the fire," she said. However, the girls are safe because they run, but they cry because their equipment is gone. The girls run to the mountain on the left because it does not erupt—and still has trees. However, there is a

crying sun behind the mountain because of the volcano eruption. “They—the girls and the sun—are friends,” she said. She explained that the disaster occurred in the morning.

Interview summary

The main interviewee is the father of Student 10, while his wife was not always involved in the conversation. Student 10 (eight years old) is their youngest, while their oldest son is 16 years old.

They live in Kampung Sukawangi, Jelegong Village, near the school. The house is surrounded by hills and mountains—even though they are not close to the house—with some hills that have been partly excavated. There is also a Citarum river stream close to the house, but it has never overflowed into the surrounding area. They have never experienced flooding during their residency in the area; he said that most of the surrounding areas are not built yet, so the land’s ability to absorb water (from the rain) is still good. However, he said that he felt light tremors that were caused by the earthquake in Sukabumi and Cianjur—approximately 100 kilometers from their house—some time ago. There is a health center and police station near the house, while the closest hospital is considered far—approximately eight kilometers from where they live. In their neighborhood, the RT leader is active in gathering people to do community work, like weekly clean up, especially on those days when there would be construction of the community mosque in a vacant space. For the time being, children use the vacant space to play. There are also lands owned by people who do not regularly live in the area, but those people let the residents cultivate their lands if they want to.

One of the mountains near his house, Mount Lagadar is part of the ancient Bandung.²¹ The residents who live closer to Mount Lagadar wanted it to be preserved because of the massive scale of the mining and excavation, and deforestation. The father of Student 10 thought that those practices will not only damage the mountain but also put the settlement in surrounding areas in danger of erosion. “They detonated the mountain,” he said. “They” refers to the private parties who detonate the mountain. He also complained that the cut hills cause a stronger wind flow to the neighborhood. “The wind was not as strong as it is today because the hills used to act as a barrier to the wind,” He believes that nowadays disaster is mostly the result of humans’ terrible actions, such as illegal logging and hill excavation, such as is happening in his living environment.

²¹ Due to its position in a previously ancient lake, some residents call the metropolitan area ancient Bandung.

He recognizes the disaster potential in the city-scale as well: the existence of Lembang Fault. “Bandung will be destroyed,” he exclaimed. He also mentioned that the city was previously an ancient lake. He got that information mostly from the internet and discussions with his work colleagues. Luckily, he and his wife have received an earthquake drill at their workplace. He said that the factory is also prone to disaster because there is not enough ground below the factory and the groundwater is also exploited which can cause erosion.

He never attends drills anywhere but their workplace. He thinks that the absence of disaster drills and education in their living environment is due to the fact that their area is considered safe by the local government and thus is not prioritized. He admits that disaster education is essential for his family because they cannot predict the timing of disasters. He observed that many people died during a disaster mainly because of panic attacks. Hence he always told Student 10 not to be easily panicked and to follow evacuation instruction should an emergency occur. He was also confident about his wife’s cake-making skill as an option for the family to generate income in the future if their workplace is affected by a disaster. Nonetheless, the demanding schedule from the factory means she cannot be entirely concentrated on the business even if she wants to be. They hope in the future there will be more drills to prepare them for facing hazards.

The family has been living in the area for 14 years. Before they lived there, Student 10’s father lived with his parents in Margahayu—one of the sub-districts in the city of Bandung, while his wife lived in Kudus, Central Java. After they married, they moved to the current residence due to its proximity to his workplace. He and his wife work as permanent employees in the same textile factory. The working days are five days a week; eight hours per day. He and his wife have a different work schedule. Due to their different work shifts, it is a challenge for them to divide their time wisely in order to spend time with Student 10 at home, especially for school assignments. “Working in shifts made me want just to have a rest after work,” he said.

However, he tried always to pay attention when Student 10 told him and his wife about her daily activities and achievements she received at school, and when she asked questions, including those about disaster. When watching news about the recent flash flooding in Papua on the television, Student 10 asked a question about why the big trees are carried away by the flood. Responding to that question, he told Student 10 that the flood is an impact of illegal logging and the land is eroded when heavy rain occurs. The challenge that he faced when helping Student 10 to study is that she has less trust in her

parents' explanation about the school subjects. "She trusts her teachers more even though my explanation and her teacher's explanation is somewhat the same," he said.

Student 10's father is a mixture of Sundanese and Javanese—Pacitan in East Java to be exact—but he was born and raised in West Java. He studied until technical high school with a specialization in electricity. His wife is originally from Kudus, Central Java. She used to study in Kudus until senior high school and then moved to Bandung to work. He reckoned that a sincere mutual help among neighbors is the Javanese cultural value in social life that he always holds. He said that people in West Java usually get paid or expect to be paid for helping others, but not in Java. Fortunately, there is a big community of migrants from Java in his neighborhood. Their mutual background let them naturally help each other, and even though they come from different areas in Java, that makes them close to each other.

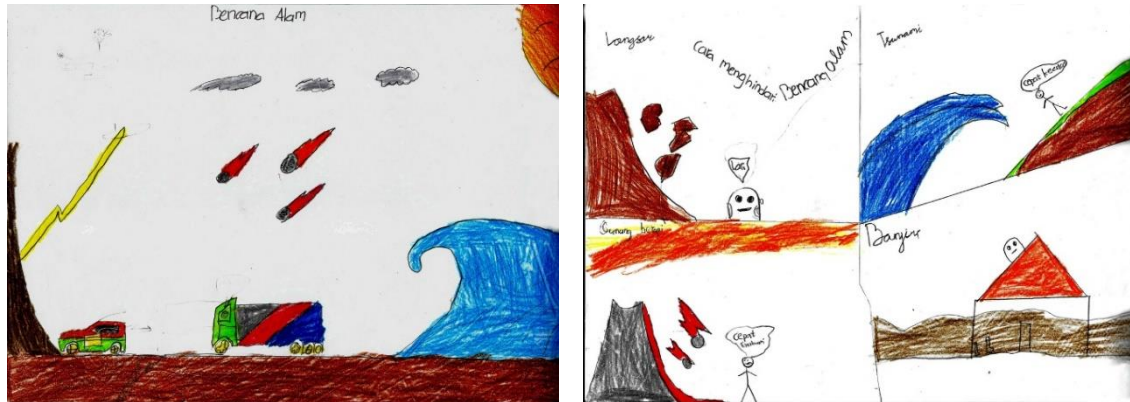
Student 10's mother said that in Java, traditional beliefs and myths are still circulating in daily life. She said that she partly believes the myths because she has experienced it herself. She gave an example that once a house lizard fell upon her mother and not long after that event, her mother died. She said, "...it is so difficult to deny the myths because sometimes it—the bad luck—happens." However, regarding the disaster, Student 10's father said that if there is a scientific explanation about the hazard, he will trust it more than the myths. Despite the strong Javanese influence in their environment, they communicate in Bahasa at home to their children.

Regarding their beliefs as Moslems, he thinks that Islamic values are essential to be transmitted to their children. "First, for their knowledge. Second, to direct their lives in the future," He said that he and his wife obliged their children to recite The Holy Koran. They also oblige their first son to fast every Monday and Thursday, while Student 10 is exempted from doing so because she is still too young, even though she voluntarily fasted for the past three months.²² He also teaches his children to pray—asking for God's protection from disaster.

²² Fasting every Monday and Thursday is one of the non-mandatory acts (*sunnah*) in Islam.

Student 11

Assessments



The drawing is about a tsunami, a meteor, and an earthquake. A colorful truck succeeds at running away from the tsunami behind it but eventually fails to flee from the meteor. The meteor strikes the truck. There is a small car in front of the truck, and the car gets hit by the meteor as well. In the drawing, there are also several dark clouds. Student 11 claimed that, "During a disaster, dark clouds usually appear in the sky." Student 11 was a little bit shy at first, but as the conversation flowed, he could explain his drawing in a precise manner. In the second drawing, he drew four different types of hazards: a landslide, tsunami, volcano eruption, and flood. Unlike in his first explanation, he explained his drawing more confidently. He explained each disaster and divided the paper into four panels. Landslide is in the upper left of the paper. There is a person—which he drew in the form of a doodle—under the hill running away from the slide. In the upper right there is a tsunami. The person is running toward "the highest hill." In the bottom left, there is a volcano eruption with a person running toward "an evacuation place," while the last picture on the bottom right shows the flood where there is a person on top of the house. "The doodle has prepared boots, but he/she forgets to wear them during the flood." Student 11 also gave his picture a title: "How to avoid disasters." He even wrote some keywords in each panel indicating what to do during a disaster. The words are "run" (for landslide), "go up quickly" (for the tsunami), and "evacuate quickly" (for the eruption).

Interview summary

The Interviewee is Student 11's mother. She is originally from Palembang, South Sumatra, while her husband is Sundanese. Student 11 can speak her local language—she is very proud of it—but the family communicates in Bahasa at home. Both she and her husband are high school graduates. She decided not to go to college due to her family's economic condition, so she moved to Bandung to work in 2002. Now she is a

housewife with two children—Student 11 and his younger sibling, while her husband works for a store owner in two places, about 30 minutes from their house by motorcycle. Her husband takes care of the owner's businesses, and by the end of the year, he reports the finance to the owner. Student 11's mother takes Student 11 to and from school daily. Her husband goes to work after she comes home from dropping off Student 11. He stays at work from around 10 am until night depending on how busy the store is. She claimed that her husband is never able to help the children with homework or school matters. As a consequence, the children tend to interact more to her.

Student 11 is an active kid. He has quite a daily schedule. He comes home from school at 2 pm, and then he studies at TPA from 3 - 4 pm. At 5 pm, he goes to another place to learn the Koran until 8 pm, and he finishes his homework afterward. Also, he learns *pencak silat* until 11 pm every Friday and Saturday.²³ The interviewee admitted that the dense schedule is Student 11's own will and she does not interfere it. She recognized that Student 11 is open to tell her about his daily activities at school, also does not hesitate to ask clarifications upon things. She and her husband teach their children to be a reliable person, to put efforts in order to achieve success. "Student 11 is very active and optimistic. He will study hard if he wants to be number one in class. He cannot stay quiet because he has strong motivation," said her. She also said that Student 11 keen on learning, especially math and science.

The family lives in a dense settlement in Cipatat Village where there are no gaps among the houses, but the two-lanes roads can accommodate two motorcycles at a time. She can see the hills from her house, but she thinks the distance to the hills is quite far. Her house is located near a health center and a public field that is usually used for playing football and community celebrations. There is a hospital, market, and police station not too far from the house as well. They moved to the current house two years ago because it was cheaper than their previous house. She admitted that she likes her current living environment because of the strong kinship among neighbors. She said that if something happens to a family, for example in a case of sickness, the other families will immediately react and help. RT and RW leaders are also active. She never has a hard time getting her administrative needs, such as ID and essential letters, done.

She enjoys living in her house because she feels safe, even from disasters. She has never experienced a significant flood, landslide, or storm during her residency there.

²³ *Pencak silat* is a traditional martial arts in Indonesia.

However, she experienced an earthquake in 2005 when she was at her workplace in a shopping mall. She was working as a clerk, and when the quake happened, she immediately closed the vault and ran outside the building.

Student 11 once told her that a new teacher taught him about an earthquake and he asked for further clarifications from her mother. Unfortunately, she does not try to introduce disaster preparedness to Student 11, even though she has experienced an earthquake herself. She confessed that if a disaster occurs and impacts her family, she does not have any preparation. Her husband only stresses prioritizing the children and getting them to a safe place. Moreover, the family does not have an additional option to generate income if the primary source of income is ever affected because they do not have any other work skills. She admitted that it is essential to teach children about disaster and steps to take during a disaster. However, she never gets any information about it from the government; her main source is word of mouth and the television.

She does not believe in any old saying or myths about nature or disaster, because she believes more in logical explanations. In addition, because of her religion, she strongly believes in helping others in need. So when a disaster happens, flood, for instance, she will give her assistance to her neighbors. She believes that teaching her children about cultural and religious matters are equally crucial because, as she said, “we are living in a world with diversity, so the children need to understand about their religion as well as their culture.”

Student 12 Assessments



The drawing is about a volcano eruption. A short description accompanies each component in the drawings. Student 12 also explained the drawings systematically and thoroughly with high confidence. “The rocks are thrown off from the volcano. The cracked rocks resulted in a great vibration. There is also lava from the volcanic ‘belly.’ If there is no lava, it means that the last eruption was thousands of years ago.” He also mentioned the volcano that recently erupted in Indonesia, “If there is the Anak Krakatau, then the mother and father of Krakatau also exist.”²⁴ In the drawing, there are burnt trees and a grey sky. He explained, “When the volcano erupted, the trees are burnt and turn into ashes, then the sky turns grey.” He further explained a possible course of action in this situation, “...when we wear a jacket, for example, it is mandatory for us to take off the jacket after it comes in contact with the volcano ashes because they contain atomic irons. We also have to avoid the area for 1-3 kilometers away.” Other components in the drawing are the mourning clouds and sun. Similarly to his pre-assessment, he thoroughly explained the picture with some information that is not delivered during the DRR program from PB. He said that “a volcano eruption happens because of the bent underground slab that resulted in the breaking out lava. So, automatically, the surrounding rocks are destroyed and thrown off. The ashes (in the top of the volcano) contain iron—or rugged material,” He said that the iron in the volcanic belly is melted and turned into ashes. He clarified that the rugged material could cause a heart attack when inhaled—even causing death. Thus, “We must avoid the volcano until the radius of 1-3 kilometers.” He also re-explained (from the pre-assessment) that we need to take off our jacket, for example, after being in contact with the ashes. Also, he told the researcher that there are several signs (of the volcano eruption) as follows: “First, smoke is seen several times. Second, a high pitched sound is heard. Third, animals behave strangely because animals can feel the temperature difference, while humans will not understand that.” In the drawing, there are also several people. One of them says, “Run quickly” and directs the others to the two-story evacuation center (the green building in the bottom right) to avoid the falling rocks. He said that leading the residents is the task of the police.

Interview summary

The interviewee is the mother of Student 12 (eight years old). She is a housewife and has a secondary school education, while her husband has an anthropology background and works as a librarian in a university in Bandung. She used to work in the garment

²⁴ *Anak* means “the child” in Bahasa. There used to be an ancient Krakatau which erupted in 1883 and was recorded as the most destructive and deadliest eruption in history. Its high latitude eruption affected the global temperature for years (Bradley, 1988). Anak Krakatau emerged from the caldera formed in the 1883 eruption—for which it called the child of the (ancient) volcano.

industry, but she quit when she had kids. She sometimes receives orders to sew at home. She is Javanese but was born in Lampung, Sumatra—and lived in several places before she migrated to West Java to work. Her husband is mixed Sundanese-Eastern Javanese.

The family lives in a duplex close to the industrial area in the Utama Sub District, Cimahi City—around five kilometers from the school. They have been living there for 11 years. The relationship among neighbors is healthy; the kids usually play together. The buildings in the area are quite dense, and open spaces are rare. She said that “the last open space we had has turned into the factory’s warehouse.” Thus, the family usually goes to the Techno Park or the Brigif military field—which usually holds weekly market—for recreation in the district. Both spaces can also be used to do sports. There are clinics, health centers, and a hospital nearby, but no police station. There is a small river nearby, which is polluted by the wastewater from the textile factory. “Sometimes, it smells,” she said. The houses in the area use treated water from the factory for cleaning that she admits sometimes smells like iron.

Her husband works from the morning until evening (around 7 pm) and her oldest son is not regularly staying at home because he studies at a boarding school in Bandung city. As a stay-at-home mother, she got the task to accompany Student 12 to work on assignments from school. When she thinks that she cannot answer Student 12’s questions, she usually looks at Google, books, or asks Student 12 to wait for her father to come home to explain. However, she restricts herself to only responding to Student 12’s questions that age-appropriate.

Student 12 likes to watch the news on the television. When he watched news about the disaster, he sometimes muttered to himself, “Ah, so the water becomes that...”, “Wow, the trees are carried away (by the water)!” Alternatively, “That is your fault, why did you cut all the trees? Now there is a flood,” In addition to television news, Student 12 also received knowledge from the environmental and disaster subject at school.

Student 12 is always actively asking questions about the books he reads—mostly science books—or the news he sees to his father, and his father is very responsive to his questions. The interviewee said that Student 12 has similar curiosity to his brother—he never feel satisfied with the information he receives. She admitted that Student 12 has more advanced intelligence than his peers. “When he was in the first grade, his

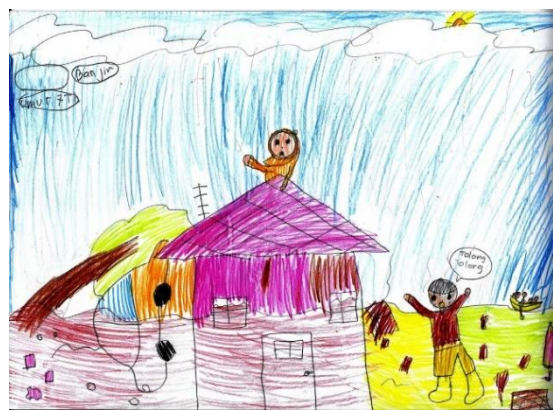
classmates thought that he was weird,” because he thinks beyond his age. Student 12 loves science and math, and not interested in drawing and coloring.

As long as she has lived in the area she has never experienced any hazards, except for a slight tremor. “I think my area is safe,” she said. However, she knows from the television and internet that the Mount Tangkuban Perahu is active and her area will be affected when the volcano erupts. She said, “the crack (from the volcano eruption) will reach Cimahi.” Her family has not prepared for disaster, but she thinks it is essential to prioritize disaster education for her children, disaster preparedness, and obey the government’s instruction (regarding catastrophe). She quite confident in her sewing skills, so she thinks it could be useful for generating income should disaster affect her husband’s job.

Regarding cultural values, she said that she only teaches Student 12 to be polite to older people. Following Islamic teaching, she has given charity to ease the burden of people who lost their families and believes that disaster is fate. For her, it is crucial to teach Student 12 about Islamic values, but she also introduces Student 12 to the (belief) differences in society and the importance of tolerance.

Student 13

Assessments



Student 13 drew a volcano eruption. She drew lava showering the place. There are many people downhill, and they are running away from the disaster. There is a house and two people in front of the houses running as well. “During the eruption, the people are running while shouting ‘aaargh run for your lives’.” On the other side of the mountain, there is a tree and a bird’s nest. The nest is empty because the birds are running away. “The birds are afraid of the eruption, so they run away like a human while yelling ‘help help, let us run.’” The sun is hiding because of the disaster. Student 13 said that there is a rescue team trying to help the victims. Student 13 was far from shy. She is fearless and

expressive, which made her willingly run—mimicking people during the emergency—while talking about her drawing. She comprehensively explained the conditions in her drawings, with excellent analysis on how to cope with disasters. Her second drawing is about a flood. The flood is surrounding a pink-colored house. During the flood, the rain is still showering hard. The house is half drowned. There is a car and a tree beside the house, as well as small things, such as an umbrella. The car is turned upside down because the water has almost filled its entire body. The tree falls and hits the house. There are two people in the picture, a boy and a girl. The girl sits on top of the house, while the boy is on land near the house. The boy wears a pair of boots and screams, “Help!” On the right side of the drawing, there is a small boat with some people on it. There are many clouds and a hiding sun as well. She added that the flood happens because people are cutting down trees and throwing garbage everywhere. “We are not supposed to litter,” she said.

Interview summary

The interviewee is the mother of Student 13 (seven years old). She has two children: her oldest son who is in secondary school and Student 13. The family communicates in Bahasa because she, as a Javanese, does not understand appropriate intonation of Sundanese. She is a teacher, while her husband works in the textile factory. She drops Student 13 and picks her up from school daily, then leaves for work. In the school where she works, she and other teachers teach the students about earthquakes. They created a song to make the students remember about the topic. The interviewee said that she and her husband always tell their children about disaster knowledge, but sometimes it is Student 13 who teaches them first. “Student 13 is enthusiastic when it comes to telling stories. When she did the earthquake drills at school, she directly told us about it,” she said.

Her family has lived in a housing cluster for 15 years, where she claimed to have an agreeable environment. She feels safe in her neighborhood because it is close to the health center, police station, and accessible to public transportation. She also feels that the cluster residents have the same perspective about raising children. Most of the residents are working mothers, so they only meet after office hours, during the weekend, or on a special occasion. This makes them too busy for useless activities, such as gossiping. Despite each resident’s activities, they still manage to have social interactions; for example, when a neighbor gets sick or goes into labor, the RT leader will gather them to visit. The relationship between neighbors is healthy. “I like that the neighbors are

welcoming, especially when I was a newcomer and was pregnant with my first son. They acted like my parents,” she claimed.

Since she has lived there, she has never experienced any significant disasters. She described a hill behind her house where it used to be green and was now being excavated, but no landslide or flood has happened to her. She has experienced a windstorm and an earthquake, but neither lasted long or caused significant damage. She claimed that when the earthquake occurred, she stayed calm, prayed, and did not move until she felt quieter, at which point she grabbed the children and took them to a safe place.

At her house, she and her children get information from the television. Student 13 also gets information from books because she likes to read. “She always borrows books from her school library. She also likes to watch a cartoon, which she usually gets information from,” said her. She said that Student 13 loves reading pictorial books with her, and Student 13 will retell the stories she has read expressively. She claimed that her daughter is active and responsive. “If she asked me about something while I am in the middle of chatting with friends, she will protest. Also, when we give answers she does not favor, she will protest,” she claimed. Besides being active, her daughter is also full of imagination. She picks crafting and drawing as her extracurricular activity.

The interviewee said that if a disaster occurred and affected her work, she would find alternative work to replace her existing work in school, which is tutoring mathematics. She is a mathematics graduate while her husband holds an associate degree in textiles. She admitted that disaster knowledge for her children is essential because they never know when a disaster will occur, and they need to have the right information on how to prepare or evacuate. She emphasized to her children the importance of being calm during a disaster. Another important thing for her is teaching her children about cultural value regarding how to behave among others. She said that she does not believe in the cultural myths, especially those about nature or disasters. “Those myths are lack of evidence or logical explanation. I only believe something that I can sense,” she claimed. She used as an example that animals will be in a panic and not stay quiet when natural phenomena are about to happen.

As a Moslem, she strongly believes in keeping herself clean. It means that people need to keep both the outer (environment) and inner self clean. “Keeping the inner self clean means that we have to treat others the way we want to be treated,” she explained. She emphasized that in the Holy Koran, several verses mention the driving factors of and possible solutions to disasters. She pointed out that in Islam, it has been written that “we

have to respect others regardless of their culture or religions, except those who commit wrongdoings.” She wants her children to understand her religion so that they will implement its values for the rest of their lives. She said that she has to keep nature as ideal as possible and pray hard in case of disaster. “It is rather selfish if we want God to protect us, but we do not protect nature. It has to be balanced,” she said in closing.

Statistics summary of background factors

From the 13 families, most of the interviews involved the mothers. Further demographic data of the students and their family representatives will be presented in the following table.

Factor 1: Economic condition

Table 5. Statistics summary of economic condition data

Variable	Data	Student and the family													Total	%
		1	2	3	4	5	6	7	8	9	10	11	12	13		
Household income structure	Multiple			1	1	1		1	1		1			1	7	53.85
	Single	1	1				1			1		1	1		6	46.15
Employment status*	N/A		1		1	2	1	2	1	1		1	1	2	13	50.00
	Not working	1	1				1			1		1	1		6	23.10
	Freelance	1		1	1				1						4	15.40
	Permanent			1							2				3	11.50
Job field/title*	Textile/garment		1			2	1		1		2			1	8	30.77
	N/A	1	1				1			1		1	1		6	23.10
	Teaching				1			1						1	3	11.54
	Furniture							1		1					2	7.69
	Midwife			1											1	3.85
	Librarian												1		1	3.85
	Entrepreneur	1													1	3.85
	Consumer goods				1										1	3.85
	Construction			1											1	3.85
	Clothing industry											1			1	3.85
	School manager								1						1	3.85
Skills*	N/A	1	1		1	2	1		1	1	1	2	1	1	13	50.00
	Entrepreneurship	1	1				1								3	11.54
	Teaching				1			1						1	3	11.54
	Knitting/sewing							1					1		2	7.69
	Cooking	1								1					2	7.69
	Electricity and weld							1							1	3.85
	Hairstyling								1						1	3.85
	Construction			1											1	3.85
	Midwifery			1											1	3.85

Variable	Data	Student and the family													Total	%	
		1	2	3	4	5	6	7	8	9	10	11	12	13			
Homeownership	Manage school								1							1	3.85
	N/A				1		1				1		1		1	5	38.46
	Renting		1			1				1				1		4	30.77
	Owning	1		1				1								3	23.08
	Staying in relatives' place								1							1	7.69

*) Data of 26 people (both parents of each family)

Factor 2: Education level

Table 6. Statistics summary of education level data

Variable	Data	Student and the family													Total	%	
		1	2	3	4	5	6	7	8	9	10	11	12	13			
Formal education*	High school	2					1	2		2	2	2				11	42.31
	University or similar		1	2	2		1						1	2		9	34.62
	N/A		1						2							3	11.54
	Secondary					1							1			2	7.69
	Primary					1										1	3.85
Access to information	Television	1	1	1	1	1	1		1	1		1	1	1	11	84.62	
	Internet		1				1	1			1				4	30.77	
	Books		1		1								1	1	4	30.77	
	Friends				1				1		1	1			4	30.77	
Dialogue intensity with children	High						1		1			1	1	1	5	38.46	
	Average	1		1	1						1				4	30.77	
	Low		1			1		1		1					4	30.77	
Awareness of the potential hazard	Yes	1		1	1	1	1	1	1		1		1		9	69.23	
	No		1							1		1			3	23.08	
	N/A													1	1	7.69	
Experience with shocks*	N/A	1	1		1	1	1	1		1		1	1	1	10	38.46	
	Yes	1	1	2	1		1	1				1		1	9	34.62	

Variable	Data	Student and the family													Total	%
		1	2	3	4	5	6	7	8	9	10	11	12	13		
Preparedness	No					1		1	1	1	2		1		7	26.92
	No		1		1	1			1	1		1	1		7	53.85
	Yes	1		1			1	1			1			1	6	46.15

*) Data of 26 people (both parents of each family)

Factor 3: Living Environment

Table 7. Statistics summary of living environment data

Variable	Data	Student and the family													Total	%
		1	2	3	4	5	6	7	8	9	10	11	12	13		
Location	Housing cluster	1			1	1		1		1				1	6	46.15
	Urban village		1	1					1		1		1	5	38.46	
	N/A						1					1		2	15.38	
Physical characteristics	Hills	1			1	1	1	1	1	1	1		1	9	69.23	
	River	1		1	1			1		1		1	6	46.15		
	Industries		1	1		1						1	4	30.77		
	Vacant space			1				1		1	1		4	30.77		
	Paddy field	1						1	1				3	23.08		
	Shophouses				1			1					2	15.38		
	Farm					1				1			2	15.38		
	Forest						1						1	7.69		
Daily stressors	Pollution			1	1	1						1	4	30.77		
	N/A						1	1			1	1	4	30.77		
	Broken road	1	1		1								3	23.08		
	Strong wind	1								1			2	15.38		
	Waste		1					1					2	15.38		
	Run-off overflows							1					1	7.69		
Population and building density	High	1	1	1	1	1			1	1	1	1	9	69.23		
	Low							1				1	2	15.38		

Variable	Data	Student and the family													Total	%	
		1	2	3	4	5	6	7	8	9	10	11	12	13			
	N/A						1		1							2	15.38
Proximity to public facilities	Clinic/health center		1	1	1	1			1		1	1	1	1		9	69.23
	Police station	1	1	1		1				1	1	1		1		8	61.54
	Market	1	1	1	1	1		1	1			1				8	61.54
	Hospital			1	1							1	1			4	30.77
	Open field	1		1		1										3	23.08
	Mosque			1	1					1						3	23.08
	Midwife								1							1	7.69
	Toll road			1												1	7.69
	N/A						1									1	7.69
	Easy accessibility	No	1	1		1	1	1				1					6
Yes				1				1		1				1		4	30.77
N/A									1			1	1			3	23.08

Factor 4: Ethnicity and Culture

Table 8 Statistics summary of ethnicity and culture data

Variable	Data	Student and the family													Total	%	
		1	2	3	4	5	6	7	8	9	10	11	12	13			
Ethnicity*	Sunda		1		2	2		2	2			1		1		11	42.31
	Java			2			1				1		1	1		6	23.08
	Mixed	1					1				1		1			4	15.38
	Sumatra									2		1				3	11.54
	N/A	1	1													2	7.69
Migration history*	No	1				2	2	2	2		1	1				11	42.31
	Yes		1	2						2	1	1	1			8	30.77
	N/A	1	1		2								1	2		7	26.92
Daily language	Bahasa		1		1	1		1	1		1	1		1		8	61.54
	N/A	1		1			1						1			4	30.77

Variable	Data	Student and the family													Total	%
		1	2	3	4	5	6	7	8	9	10	11	12	13		
	Bataknese									1					1	7.69
Importance of cultural values	Yes	1	1	1		1	1			1	1	1	1	1	10	76.92
	No				1			1							2	15.38
	N/A								1						1	7.69
Length of Residency	> 5 years			1	1			1	1		1		1	1	7	53.85
	1-5 years	1				1	1			1		1		5	38.46	
	< 1 year		1											1	7.69	
Community leader involvement	Yes	1		1						1	1	1		1	6	46.15
	No		1		1	1		1						4	30.77	
	N/A						1		1				1	3	23.08	
Relationship with neighbors	Good			1		1		1			1	1	1	1	7	53.85
	N/A	1	1		1				1					4	30.77	
	Bad						1			1				2	15.38	

*) Data of 26 people (both parents of each family)

Factor 5: Religion

Table 9 Statistics summary of religion data

Variable	Data	Student and the family													Total	%
		1	2	3	4	5	6	7	8	9	10	11	12	13		
Religion	Islam	1	1	1	1	1	1	1	1		1	1	1	1	12	92.31
	Christian									1					1	7.69
Extra religious activities	Yes		1			1	1	1	1	1		1		7	53.85	
	N/A	1		1	1						1		1	1	6	46.15
Religious values	Mental	1		1		1	1	1	1	1	1	1		10	76.92	
	Physical		1										1	2	15.38	
	N/A				1									1	7.69	