

IMPLEMENTATION OF DISASTER PREPAREDNESS EDUCATION IN ELEMENTARY SCHOOLS IN DEALING WITH THE HAZARD OF EARTHQUAKES IN WEST BANDUNG REGENCY

Ova Huzaefah ^{a*)}, Jamilah, Syahroni ^{a)}, Artono ^{a)}, N. Ilis ^{a)}, Taupik Lubis ^{a)}, Bermara Giri Menur Sari ^{a)}

^{a)} STKIP Arrahmaniyah, Depok, Indonesia

^{*)}Corresponding Author: huzaefaho@gmail.com

Article history: received 17 April 2024; revised 21 May 2024; accepted 20 July 2024

DOI: <https://doi.org/10.33751/jhss.v8i2.10889>

Abstract. : Earthquake hazard has high potential in West Bandung Regency, especially in the areas traversed by the Lembang fault (Lembang, Cisarua and Parongpong Districts). Therefore, disaster preparedness education is needed to reduce hazard, impacts, and increase the capacity of elementary school (SD). The purpose of this study was to determine the condition and level of preparedness of the elementary school in the three sub-districts in facing earthquakes based on implementation of disaster preparedness education. This study used a quantitative approach through a survey with a sample size of 118 students, 36 teachers, and 36 principals/representatives of SD in Lembang, Cisarua, and Parongpong Districts, West Bandung Regency. Measurement of preparedness is carried out by measuring the parameters of knowledge, policies and guidelines, emergency response plans, disaster warnings and resource mobilization in the elementary school then analyzed using index analysis which shows the level of preparedness of the elementary school. The results showed that students' preparedness falls into category prepared (index = 75.48), as well as teachers' preparedness (index = 73.38), while the school preparedness falls into category not yet prepared (index = 31.9) and should improve its' preparedness. These results indicate that students' and teachers' level of preparedness are very good although the infrastructure and the school preparedness implementation are not yet sustainable. The results also showed that the level of preparedness of the elementary school in the region falls into category of nearly prepared with an index value of 56.13. School as an institution and the whole school community should increase the level of preparedness through further study focusing in seismic study and structural or nonstructural study. Disaster preparedness in elementary school (SD) takes infrastructure support, education and institutionalization of preparedness that eventually allows the preparedness actions.

Keywords: disaster preparedness; education; elementary school; earthquake

I. INTRODUCTION

Indonesia is one of the places that is often hit by earthquakes because of Indonesia's geographical location on the collision of three large tectonic plates, namely the Eurasian LemqZApeng, the Indo-Australian Plate and the Pacific Plate (BNPB, 2010). The movement of these plates is what triggers the active faults that cross most regions in Indonesia including West Java (Hidayat et al., 2008). If this fault becomes active, the area it passes through becomes prone to earthquakes.

The existence of interactions between these plates places the Indonesian region as a region that is very prone to earthquakes (Milson et al., 1992). The high level of seismic activity can be seen from the results of recording where in the period 1897-2009 there were more than 14,000 earthquakes with a magnitude of $M > 5.0$ (Irsyam et al., 2010). In the last six years, various major earthquake activities have been recorded in Indonesia, namely the Aceh earthquake accompanied by the tsunami in 2004, the Nias earthquake in

2005, the Yogyakarta earthquake in 2006, the Tasik earthquake in 2009 and finally the Padang earthquake in 2009 (Irsyam et al., 2010).

Almost all destructive earthquakes are produced by movements along active faults (Hidayat et al., 2008). According to Keller and Pinter (1996), an active fault is a fault that once moved over the past 10,000 years. One of the faults that is estimated to be an active fault that triggered an earthquake in West Java is the Lembang Fault (Hidayat et al., 2008).

The Lembang Fault is located approximately 10 km north of Bandung City which crosses Lembang District with a length of about 22 km in a west-east direction (Hidayat, 2009). The existence of this fault crosses densely populated settlements and tourist areas. The Lembang Fault is one of the most interesting geological landmarks in the Bandung plateau with a clear geomorphological expression of neotectonic activity in the Bandung Basin (Karoeboka, 2006). Its close proximity to residential areas along Lembang to Cisarua, resulting in this fault having the potential to cause earthquake

disasters in the area and around the area. It is proven by the earthquake in 1999 that it originated from the fault (Kertapati, 2006 and Marjiyono et al., 2008). Based on the catalog of destructive earthquakes in Indonesia (Supartoyo and Surono, 2008), an earthquake due to the activity of the Lembang Fault was recorded on July 11, 2003 which caused damage to buildings in Cihideung Village, Lembang and the tremors were felt in the northeast of the city of Bandung. An earthquake due to the Lembang fault activity also occurred on July 22, 2011, at 10:00 p.m. 05.46 WIB is at coordinates 107.72° E and 6.84°S at a depth of 6 km with a magnitude of 3.4 on the Richter scale which caused damage to buildings in Jambudipa Village, Cisarua District (Sulaeman and Hidayati, 2011).

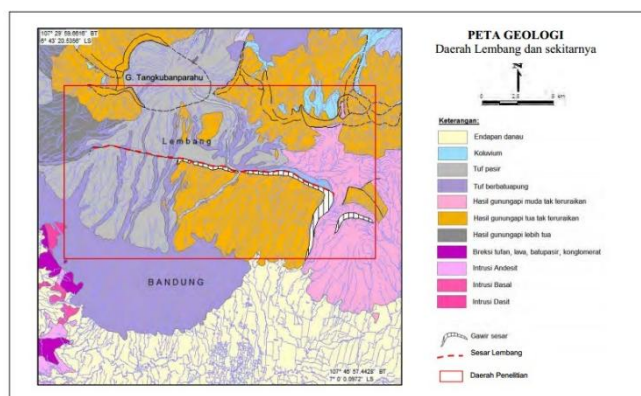


Figure 1. Geological map of the Bandung sheet and research area (Silitonga (2003) in Hidayat (2009))

Schools in earthquake-prone areas are at risk of severe damage and even victims, both students and teachers. Based on the experience of natural disasters in the past, unsafe schools are the cause of death in the event of a disaster (Shoichi, 2009). Data from the United Nations International Strategy for Disaster Reduction (UNISDR) (2008) states that earthquakes have caused many casualties in the school community, including:

- In May 2008, the Wenchuan earthquake in Sichuan, China, claimed about 7,000 students trapped in the ruins of a school building.
- The earthquake disaster that occurred during school hours in the Spitak area of Northern Armenia, which claimed the lives of many students due to the rubble of the earthquake, for example, in one school, as many as 285 out of 302 children died.
- The 1999 earthquake in Chi Chi, Taiwan, caused 43 schools in Nantou and Taichung provinces to be completely destroyed and about 700 other schools across the country were damaged to varying degrees.
- The earthquake in Gujarat, India in 2001, damaged more than 11,600 schools.
- The earthquake that occurred in Kashmir in 2005. The earthquake occurred just as school started and caused the deaths of 18,000 students, most of whom were trapped in the ruins of the school building. The Kashmir earthquake

also caused the collapse of 6,700 schools in the outskirts of the northwestern province and about 1,300 schools in the Pakistani-administered Kashmir region were also damaged.

Conditions in Indonesia are not much different. Thousands of children have been victims of damage and chaos due to disasters in Indonesia. One-third of the 200,000 victims who died in the 2010 Aceh tsunami were children (Andina, 2010). Children's vulnerability to disasters is due to limited understanding of disasters and lack of preparedness in dealing with disasters (PMI, 2005). The level of disaster risk is not only determined by the potential for disaster, but also determined by preparedness efforts in dealing with disasters (UI Psychological Crisis Center, 2012).

The impact of the earthquake disaster is so large that it is a major problem for the community and the school community. The magnitude of the impact depends on the level of hazard, vulnerability, and capacity in dealing with disasters. According to Ozmen (2006), schools have a very important role in preventing and reducing the impact of disasters and to achieve resilient communities. Realizing this, UNISDR launched a disaster risk reduction campaign in schools during 2006 and 2007 (Shoichi et al., 2009). The campaign is aimed at raising awareness to prioritize school safety in various countries and has become a global movement, such as earthquake basic knowledge and education by UNISDR and a joint movement in school safety initiatives. Disaster risk reduction (DRR) is a long-term activity, as part of sustainable development, by using knowledge, innovation, and knowledge to build a safe and resilient culture in all educational units, as stated in the Hyogo Framework for Action 2005-2015, and has also become a commitment of the Indonesian nation with the development of a DRR mainstreaming strategy (Ministry of Education and Culture, 2010).

The concept of mainstreaming DRR in the education system is the process of incorporating various DRR considerations into the education system including the expansion of work and results of policies, strategic frameworks, planning, implementation, institutional measures, infrastructure facilities, and learning implementation in learning participants; or to develop and develop activities for prevention, disaster mitigation and disaster preparedness in educational institutions (Ministry of Education and Culture, 2010). Disaster preparedness education is very important to be carried out in schools because students are members of society who are vulnerable to natural disasters. Carter stated that preparedness is the actions that enable governments, organizations, communities, and individuals to respond effectively and quickly to disaster situations (Carter, 2008). Disaster preparedness can be done by preparing oneself with effective equipment, with the aim of improving safety and protecting human lives (Coppola, 2007).

After disaster preparedness education efforts are carried out in schools, to find out the level of preparedness of the school community, it is necessary to take measurements.

There are several frameworks used, including the LIPI-UNESCO and Sutton-Tierney frameworks. Some previous studies have shown that effective disaster preparedness efforts in schools are not only limited to teaching but also by involving students in disaster preparedness activities and practices and that the importance of community or community involvement to support students in disaster risk reduction efforts in schools (Shiwaku, Shaw, Kandel, Shrestha, & Dixit, 2007). Kano and Bourque (2008) concluded that the level of school preparedness is positively influenced by funding for preparedness efforts and the institutionalization of disaster preparedness groups in schools. In addition, Hosseini and Izadkhah (2006) concluded that school emergency preparedness/response plans should be part of the regional/government disaster management plan which also includes detailed disaster response plans and personnel training.

In elementary school, students can become agents as well as communicators to disseminate knowledge about disaster education to their peers, parents and the environment. Students are an asset for the development and future of the nation, so they must be protected from various disaster threats. Thus, it is very important that every school in disaster-prone areas has preparedness in dealing with disasters as part of efforts to reduce disaster risk. Disaster preparedness education can help students know the potential danger of earthquake disasters in the Lembang fault area and the importance of preparedness for schools in facing the threat of earthquake disasters, so it is necessary to carry out disaster preparedness education and research efforts to measure the level of school preparedness in dealing with earthquake disasters in the Lembang, Cisarua, and Parongpong sub-districts of West Bandung Regency. This research focuses on how the level of preparedness of elementary schools based on the implementation of disaster preparedness education in the sub-districts of Lembang, Cisarua, and Parongpong, West Bandung Regency which are prone to earthquakes.

Research to measure the level of school preparedness based on the implementation of disaster preparedness education is part of efforts to reduce disaster risk more effectively. This research will focus on the implementation of disaster preparedness education and the level of preparedness of elementary schools in dealing with earthquake hazards. Because, at school age, children spend most of their time in school so the likelihood of an earthquake occurring by the time they are in school is very high.

This research was conducted in elementary schools (SD) in Cisarua, Lembang, and Parongpong Districts, West Bandung Regency. Elementary schools (SD) were chosen because in terms of age, knowledge, and experience of elementary school students are considered to be less than junior high and high school students, making elementary school students more vulnerable. According to the Center for Education Data and Statistics (PDSP) (2013), the number of elementary school buildings in the three sub-districts is more than the level of junior and senior high school education units, which makes them more vulnerable to earthquakes.

II. RESEARCH METHODS

The method used in this study is a quantitative descriptive research method using index analysis. This research will reveal information about the picture of the level of preparedness of the school community. The research design used is cross sectional or survey, i.e. all observed variables, both independent and dependent, are measured at the same time during the research (Jannah and Prasetyo, 2005). This research will be conducted in elementary school communities (SD) in three sub-districts, namely Cisarua, Lembang, and Parongpong Districts, West Bandung Regency. The location was chosen with the consideration that the three sub-districts are areas prone to earthquake disasters caused by the movement of the Lembang Fault.

The sampling method of this study is simple random sampling or Simple Random Sampling (SRS) from elementary school data in Lembang, Cisarua, and Parongpong Districts. To calculate the minimum sample number, the Isaac and Michael formula is used (Sugiyono, 2012). The minimum number of samples obtained, which is 95.34, was rounded to 95 SD/MI students. The researcher added 13% of the sample to avoid exclusion in the middle of the research so that the number of samples to be studied became 107 SD/MI students. The number of schools followed the sample number of 107 with representatives of each school as many as 3 elementary/MI students. To obtain data representing the 3 sub-districts, around 36 schools were needed with the proportion of Lembang District as many as 17 SD/MI, Parongpong District as many as 11 SD/MI, and Cisarua District as many as 8 SD/MI. Furthermore, to determine which elementary schools were the research sites, a linear systematic sampling method was used. Procedure for using linear systematic sampling method (Shalabh, 2013).

After the entry process is complete, the next data analysis technique used is to make a table of each variable or a cross table between variables, bar charts, and pie charts. Single tables, cross-variable tables, and bar charts are used to describe the state of preparedness of the school community in dealing with disasters. The level of preparedness of the school community in this study was analyzed using index values. Index value is a comparison number between one number and another that contains certain characteristic information at the same or different place and time (LIPI and UNESCO/UNISDR, 2006). The index figures in this study include indexes per parameter, namely knowledge and attitudes (PS); policies and guidelines (KP), emergency response plans (RT); disaster warning system (SP), resource mobilization (MS), asset protection (PA), adjustment to emergency and recovery conditions (PKP), and implementation of recovery activities (PP) at each source of questionnaire.

III. RESULTS AND DISCUSSION

The level of preparedness of the school community in this study is categorized into 5, as follows:

Table 1. Household Preparedness Level Assessment

No	Index Value	Category
1	80 – 100	Highly Prepared
2	65 – 79	Ready
3	55 – 64	Almost Ready
4	40 – 54	Less Prepared
5	Less than 40 (0 - 39)	Not Ready

Source: LIPI-UNESCO/ISDR: 2006, 47

The index range is at a value of 0 – 100. The overall index value of the sample is the sum of the parameter index of a single respondent. The overall index of the sample is calculated by summing the index of the entire sample divided by the number of samples.

The combined index of several parameters is calculated using a weighted composite index, meaning that each parameter has a different weight. The value of the preparedness index is calculated by using the weighted average value of each preparedness parameter, in calculating the school preparedness index against 5 parameters.

The determination of the index value for each parameter is calculated based on the formula :

$$\text{Index} = \frac{\text{Total real score parameter}}{\text{Maximum score parameter}} \times 100\%$$

Source: Anwar, 2011

Table 2. Characteristics of the school community sample

School Characteristics School Status	Frequency	Percentage (%)
Negeri	31	86,1
Swasta	5	13,9
Jumlah Siswa		
Laki-laki	32	29,6
Perempuan	76	70,4
Jumlah Guru		
Laki-laki	11	30,6
Perempuan	25	69,4
Ketinggian Sekolah dari Permukaan Laut		
Rendah		
Sedang		
Tinggi	36	100
Topografi		
Pegunungan Landai/Curam		
Pantai Landai/Curam		
Perbukitan Landai/Curam	36	100
Jenis Dinding		
Beton/bata	36	100
Kayu/Papan		
Jenis Bangunan		
Bertingkat	9	25
Tidak Bertingkat	27	75

Table 2 shows the total number of public primary schools (SDN) studied as many as 31 schools, more than the private schools which totaled 5 schools. Of the 36 schools, the percentage of female teacher respondents (69.4%) was higher than male teacher respondents (30.6%). Meanwhile, the

percentage of female student respondents is also higher (70.4%) than male student respondents (29.6%).

The height of the school in the three sub-districts is at an altitude of > 1000 m, including highlands with hilly topography. The table also shows the type of wall and type of school building. All schools, namely 36 schools (100%) use concrete/brick walls. For the type of building, a small part of the school buildings, namely 9 schools (25%) use multi-storey buildings and the other 27 schools (75%) are non-storey. The level of preparedness of the school community is a combination of the level of preparedness of the school as an institution, teachers, and students. In general, the school community's preparedness index in dealing with earthquakes in this study is as follows.

TABLE 3. School community preparedness index

Parameter	Sekolah	Guru	Siswa	Total
Pengetahuan (P)		78	78,8	78,34
Kebijakan (K)	27,8			27,8
Rencana Tanggap Darurat (RTD)	30,42	71,7	66,25	46,8
Peringatan Bencana (PB)	54,63	42,6	54,8	51,05
Mobilisasi Sumber Daya (MSD)	27	57,9	48,15	35,8
Perlindungan Aset (PP)	22,6			22,6
Penyesuaian Kondisi Darurat dan Pemulihan (PKP)	6,9			6,9
Penyelenggaraan Pemulihan (PP)	0			0
Total	26,39	70,78	73,61	50,48

Table 3 shows the preparedness index according to the parameters and components of the school community consisting of the school as an institution, teachers, and students. The index according to the components of the school community, the school as an institution has low preparedness or is not ready (index = 26.39). The teacher component index has a fairly high preparedness or is in the ready category (index = 70, 78). Meanwhile, the student component index is included in the ready category (index = 73.61).

Based on table 3, it is known that the total index of the school community is in a state of unpreparedness (index = 50.48). Although the total index was declared to be less prepared, the index of the knowledge parameters of teachers (index = 78) and students (index = 78.8) was in a state of preparedness. The total knowledge index is expressed in a ready state (index = 78.34)

The index of school policy and guideline parameters is in the unready category (index = 27.8).

The parameter index of the total emergency response plan was at an underprepared level (index = 46.8). Meanwhile, the school component response plan index is in a state of unready (index = 30.42). Even so, the index of emergency response plans of teachers (index = 71.7) and students (index = 66.25) is in a state of readiness.

Table 3 also shows that the index of total disaster warning parameters is in an underprepared state (index = 51.05). This is followed by the school disaster warning index (index = 54.63), teachers (index = 42.6) and students (54.8) who are in an unprepared condition.

The total resource mobilization index is in an unready condition (index = 35.8). The school resource mobilization index is also in an unready condition (index = 27). But in

contrast to schools, the teacher mobilization index is in a state of almost readiness (index = 57.9). Meanwhile, the mobilization of student resources is in a state of lack of readiness (48.15).

The index of asset protection parameters is in an unready condition (index = 22.6). Followed by other parameters, namely the parameters of emergency response adaptation and recovery (index = 6.9) and recovery initiation (index = 0) which are also in an unprepared condition.

Preparedness activities include developing all preparedness strategies, policies, institutional structures, early warning system capabilities or forecasting, and planning that determine measures aimed at assisting at-risk communities in safeguarding their lives and assets by being alert to hazards and taking appropriate action in the face of imminent threats or disasters (UNISDR & UNOCHA, 2008). According to Carter (1991) in (LIPI-UNESCO/ISDR, 2006) preparedness is the actions that enable governments, organizations, communities, communities and individuals to respond effectively and quickly to disaster situations. Included in the preparedness measures are the preparation of disaster management plans, resource maintenance and personnel training. Meanwhile, UNOCHA-UNISDR (2008) states that preparedness is the knowledge and capacity developed by the government, professional organizations organizing emergency response and post-disaster recovery, communities and individuals to effectively anticipate, respond, and recover from the impact of dangerous events or conditions that can and will occur.

From a psychological perspective, preparedness is seen as something that consists of activities that aim to improve response activities and coping skills (Sutton & Tierney, 2006). The eight dimensions of disaster preparedness according to Sutton and Tierney (2006) include disaster knowledge, management of the direction and coordination of emergency operations, formal and informal agreements, supporting resources, protection of life safety, protection of property, adjusting to emergencies and recovery, and finally quickly identifying recovery activities.

Şakiroğlu (2005) stated that preparedness can reduce the physical and psychological impact that disasters can cause and so that individuals do not experience traumatic/stressful symptoms in the event of a disaster in the future. Meanwhile, according to Şakiroğlu (2005), preparedness consists of at least 3 categories, namely:

- a. Resource readiness, including materials and materials needed during disasters, e.g. food, water supply, P3K equipment, etc.
- b. Emergency planning, including coordination, evacuation and rescue plans.
- c. Knowledge and skills, The third category relates to the individual's knowledge and abilities regarding disasters and disaster response.

In general, UNOCHA-UNISDR (2008) provides an explanation that preparedness is a pre-disaster activity carried out in the context of disaster risk management and based on good risk analysis. This includes the development/improvement of overall preparedness strategies, policies,

institutional structures, warnings and forecasting capabilities, as well as plans that specify tailored measures to help at-risk communities save their lives and assets by being alert to disasters and taking appropriate actions to address imminent or actual threats. Preparedness as part of the disaster management process is a concept that is developing today, increasing preparedness is one of the important elements of proactive disaster risk reduction activities, before a disaster occurs.

The change in the paradigm of disaster management is no longer viewed as an action during an emergency response situation but disaster management is prioritized in the pre-disaster phase which aims to reduce disaster risk. All activities that are within the scope of pre-disaster are prioritized. Activities in disaster management consist of activities before the occurrence of a disaster (pre event), and after the occurrence of a disaster (post event) (Bappenas, 2009). Activities after a disaster can be in the form of disaster response/emergency response or disaster recovery. Activities carried out before a disaster occurs can be in the form of disaster preparedness and disaster mitigation (reducing the impact of disasters).

From these various understandings, in this study, it can be concluded that preparedness is the steps taken by governments, organizations, communities, and individuals that are carried out quickly and effectively to improve safety when disasters occur. Preparedness is carried out before a disaster occurs but the potential for it to occur is already there.

To understand preparedness, several theoretical approaches can be used, one of which is Social Cognitive Theory by Bandura in 1986. This theory posits that there is an interaction between individual, behavioral, and environmental factors that can result in preparedness. (Zeviar et al, 2012).

Paton (2005) research on disaster preparedness reviewed from the perspective of social cognition explains that preparedness is conceptualized as three separate but interrelated phases, namely factors that motivate individuals to prepare, the formation of intentions, and the decision to prepare. According to Paton (2003), social cognition variables including problem-focused coping, self-efficacy, and sense of community can predict preparedness and resilience to natural hazards.

Cognitive factors in individuals include knowledge, expectations, subjective perceptions, values, goals, and personal standards that play an important role in shaping personality, then personality will affect behavior. Changes in environmental factors, such as disasters, will cause a person to change their behavior to be more alert. (Lenawida, 2011; Zeviar et al, 2012)

According to Ronan et al. (2005), in research on preparedness in children in schools, a significant difference was found between children who had participated in disaster education programs and children who did not participate in the program, where it was reported that children who did not participate in disaster education often felt afraid when thinking or talking about disasters. Furthermore, compared to children who have participated in disaster education programs,

children who have not participated in disaster education programs have the perception that their parents can become angry if they are invited to discuss a dangerous event or a disaster. Paton (2003) research on disaster preparedness reviewed from the perspective of social cognition explains that preparedness is conceptualized as three separate but interrelated phases, namely factors that motivate individuals to prepare, the formation of intentions, and ultimately the decision to prepare.

Schools have a responsibility to be on standby when an earthquake occurs so that they can keep children safe when a disaster occurs. Preparedness education given to children must be continued with drill exercises on safe attitudes and evacuation (Mamogale, 2011). In addition, schools can connect children, families and communities in disaster preparedness efforts. In addition to its main function as an educational medium for children, schools also make other contributions that are more than just educational media. Schools also contribute to the development of diverse regions, ranging from culture to economic activities, from information to the environment and vice versa.

IV. CONCLUSION

Based on the results of the research that has been carried out, it can be concluded that the level of preparedness of the school community in dealing with earthquakes in Lembang, Parongpong, and Cisarua Districts, West Bandung Regency is 50.48%. This shows that the level of preparedness of the school community to face earthquakes in the region is still relatively low. From the results of the study, the recommendations that can be given by the researcher are as follows: For local governments, especially in the West Bandung Regency area. From the research, parameters were obtained that were built by the researcher to measure the level of preparedness. These results can be used by BPBD and the West Bandung Regency Education Office, to conduct further studies, especially related to seismic or structural studies as well as non-structural studies. For the next researcher in the field of disasters. Further research is still needed on other factors that are more measurable for the preparedness of the school community to face earthquakes. The results of existing research must be communicated between researchers and decision-makers in order to obtain comprehensive variables to improve the preparedness of the school community to face disasters. For the school community in Indonesia in general and West Bandung in particular, the results from the research were obtained that the preparedness of the school community to face the earthquake must involve the surrounding community.

REFERENCES

- [1] Andina, S. (2010). Disaster Preparedness Education for Young Children. 5th Annual International Workshop & Expo on Sumatra Tsunami Disaster & Recovery.
- [2] Ando Shoichi, Subedi Jishnu, Fujieda Ayako, Nakamura Hayato [editor]. 2009. Mengurangi Kerentanan Anak-anak Sekolah terhadap Bahaya Gempa Bumi. Jepang : UNCRD.
- [3] Anwar, Herryal Z. 2011. Fungsi Peringatan Dini dan Kesiapan Masyarakat dalam Pengurangan Risiko Bencana Tsunami di Indonesia: Studi Kasus di Kota Padang. Jurnal Riset Geologi dan Pertambangan Vol. 21No. 2 (2011), 75 – 88.
- [4] Badan Nasional Penanggulangan Bencana (BNPB). (2010). Rencana Aksi Nasional Pengurangan Risiko
- [5] Carter, W. Nick, Disaster Management: A Disaster Management's Handbook, Second Edition, (mandaluyong City: Asian Development Bank, 2008), Hlm 213
- [6] Coppola, Damon. P., Introduction to International Disaster Management, (Burlington: Elseiver Inc., 2007), Hlm. 209
- [7] Hidayat E., Brahmantyo B., dan Yulianto E. 2008. Analisis Endapan Sagpond pada Sesar Lembang. Jurnal Geoaplika, Volume 3, Nomor 3, hal. 151 – 161.
- [8] Hidayat, Edi. 2009. Analisis Morfotektonik Sesar Lembang. Tesis. Tersedia [online] di <http://digilib.itb.ac.id/gdl.php?mod=browse&node=3210>.
- [9] Mahmood Hosseini, Yasamin O. Izadkhah, (2006) "Earthquake disaster risk management planning in schools", Disaster Prevention and Management, Vol. 15 Iss: 4, pp.649 – 661
- [10] Irsyam, Masyhur, Wayan Sengara, Fahmi Aldiamar, Sri Widiyantoro, Wahyu Triyoso, Danny Hilman, Engkon Kertapati, Irwan Meilano, Suhardjono, M. Asrurifak, M. Ridwan. 2010. Ringkasan Hasil Studi Tim Revisi Peta Gempa Indonesia 2010. Bandung : BNPB, Bappenas, AIFDR, Kemen PU
- [11] Jannah, Lina Miftahul dan Prasetyo, Bambang. (2005). Metode Penelitian Kuantitatif. Jakarta : PT RajaGrafindo Persada.
- [12] Kano, M. and Bourque, L. (2008). "Correlates of School Disaster Preparedness: Main Effects of Funding and Coordinator Role." Nat. Hazards Rev., 9(1), 49–59.
- [13] Karopoboka, Barian. 2006. Analisis Deformasi Sesar Lembang Dengan Pendekatan Geodetik. Tesis. Tersedia [online] di <http://digilib.itb.ac.id/gdl.php?mod=browse&node=2812>
- [14] Keller, E. A. dan Pinter N., 1996. Active Tectonics (Earthquake, Uplift and Landscape). Prentise Hall, Upper Saddle River, New Jersey 07458.
- [15] Kemdikbud. 2010. Strategi Pengarusutamaan Pengurangan Risiko Bencana di Sekolah. Jakarta
- [16] Kertapati E., 2006. Aktivitas Gempabumi di Indonesia (Perspektif Regional pada Karakteristik Gempabumi Merusak). Pusat Survey Geologi, Badan Geologi, Bandung.
- [17] LIPI-UNESCO/ISDR. (2006). Kajian Kesiapsiagaan Masyarakat Dalam Mengantisipasi Bencana Gempa

- Bumi dan Tsunami. Jakarta: Lembaga Ilmu Pengetahuan Indonesia.
- [18] Milson, J., Masson D., Nichols G., Sikumbang N., Dwiyanto B., Parson L., Kallagher H., (1992), The Manokwari Trough and The Western End of The New Guinea Trench, *Tectonics*, 11, 145-153.
- [19] Pusat Krisis Fakultas Psikologi Universitas Indonesia. (2012). The 4th Learning From Japan Symposium 2012. diakses 15 Agustus 2013 dari
- [20] http://www.puskrispsiui.or.id/index.php?option=com_k2&view=itemlist&task=user&id=62
- [21] Shalabh. 2013. Systematic Sampling : Module Lecture Department Of Mathematics And Statistics Indian Institute Of Technology Kanpur.
- [22] Koichi Shiwaku, Rajib Shaw, Ram Chandra Kandel, Surya Narayan Shrestha, Amod Mani Dixit, (2007) "Future perspective of school disaster education in Nepal", *Disaster Prevention and Management*, Vol. 16 Iss: 4, pp.576 – 587
- [23] Sugiyono. (2012). *Metode Penelitian Kombinasi (Mixed Methods)*. Jakarta: Alfabeta.
- [24] Sulaeman C dan Hidayati S. 2011. Gempa Bumi Bandung 22 Juli 2011. *Jurnal Lingkungan dan Bencana Geologi*, Vol. 2 No. 3 Desember 2011: 185 – 190.
- [25] Sunyoto, Danang. (2013). *Metodologi Penelitian Akuntansi*. Bandung: PT Refika Aditama Anggota Ikapi.
- [26] Supartoyo dan Surono, 2008, *Katalog gempa bumi Merusak di Indonesia*. Bandung : Pusat Vulkanologi dan Mitigasi Bencana Geologi (PVMBG).
- [27] Sutton, J., & Tierney, K. (2006). *Disaster Preparedness: Concepts, Guidance, and Research*. Institute of Behavioral Science University of Colorado.
- [28] UNISDR. 2008. *Disaster Prevention for Schools Guidance for Education Sector Decision Makers: Consultation version*, November 2008. Thematic Platform for Knowledge and Education. Geneva.