Community Development Journal (hal: 76-82)
Volume 7. No. 2
Agustus 2023

p-ISSN: 2580 5282
e-ISSN: 2580 5290
DOI: 10.33086/cdj.v7i2

Improving School Disaster Preparedness Through Teacher, Cadre Training and Disaster Simulation for Students at Public Elementary School

Satriya Pranata[1*], Aric Vranada[2], Anna Kurnia[3], Risnatun Hasanah[4], Novita Andresta Putri[5], Siti Juhro[6], Khani Fatul Khusna[7]

[1,2,3,4,5,6,7]*Universitas Muhammadiyah Semarang*

** E-mail: satriya.pranata@unimus.ac.id*

Submitted article	January.14.2023
Reviewed article	August.27.2023
Accepted article	August.31.2023

Abstract

Based on its geographical location, Public Elementary School (PES) 1 Banyuroto, Sawangan, Magelang, Central Java is located in an area prone to volcanic eruptions and earthquakes. Because in general disaster hazards can occur at any time, it is very important for the school environment to improve its preparedness in disaster preparedness. One of the efforts that is considered the most strategic is through training and disaster simulation for cadres, school teachers and students to improve their ability to respond to disasters through disaster preparedness schools. The purpose of this activity is to realize the implementation of disaster management training activities and disaster simulation at PES 1 Banyuroto. The method used is direct instruction to increase partners' understanding related to disaster and disaster mitigation materials, Forum Discussion Groups to develop disaster learning modules and simulations to improve the skills of disaster response partners. This activity was carried out at PES 1 Banguroto, Sawangan, Magelang, Central Java. The output targets resulting from this activity are the formation of evacuation route maps and their explanations and the preparation of disaster learning modules that can be used in the learning process and implementation of earthquake disaster simulations at PES 1 Banyuroto, Magelang, Central Java. The development of a disaster preparedness school program will effectively contribute to the early prevention of disaster hazards.

Keywords: School Disaster Preparedness; Disaster Simulation; Earthquake

Abstrak

Berdasarkan letak geografisnya, Sekolah Dasar Negeri (PES) 1 Banyuroto, Sawangan, Magelang, Jawa Tengah terletak di daerah rawan letusan gunung berapi dan gempa bumi. Karena pada umumnya bahaya bencana dapat terjadi kapan saja, maka sangat penting bagi lingkungan sekolah untuk meningkatkan kesiapsiagaannya dalam kesiapsiagaan bencana. Salah satu upaya yang dinilai paling strategis adalah melalui pelatihan dan simulasi bencana bagi kader, guru sekolah dan siswa untuk meningkatkan kemampuannya dalam merespon bencana melalui sekolah siaga bencana. Tujuan dari kegiatan ini adalah untuk mewujudkan pelaksanaan kegiatan pelatihan penanggulangan bencana dan simulasi bencana di PES 1 Banyuroto. Metode yang digunakan adalah instruksi langsung untuk meningkatkan pemahaman mitra terkait materi bencana dan mitigasi bencana, Forum Kelompok Diskusi untuk mengembangkan modul dan simulasi pembelajaran bencana untuk meningkatkan keterampilan mitra tanggap bencana. Kegiatan ini dilaksanakan di PES 1 Banguroto, Sawangan, Magelang, Jawa Tengah. Target output yang dihasilkan dari kegiatan ini adalah pembentukan peta jalur evakuasi beserta penjelasannya serta penyusunan modul pembelajaran kebencanaan yang dapat digunakan dalam proses

p-ISSN: 2580 5282
e-ISSN: 2580 5290
DOI: 10.33086/cdj.v7i2

pembelajaran dan implementasi simulasi bencana gempa bumi di PES 1 Banyuroto, Magelang, Jawa Tengah. Pengembangan program sekolah kesiapsiagaan bencana akan secara efektif berkontribusi pada pencegahan dini bahaya bencana.

Kata kunci: Kesiapsiagaan Bencana Sekolah; Simulasi Bencana; Gempa bumi

INTRODUCTION

Based on its geographical location, Public Elementary School (PES) 1 Banyuroto, Sawangan, Magelang, Central Java is located in an area prone to volcanic eruptions and earthquakes. So it is very important to be prepared for disaster hazards to reduce the risk of the impact of these disasters through various efforts such as reducing vulnerability and increasing the ability to deal with disasters (Sangkala and Gerdtz, 2018; Rokhmah, Khoiron and Burlakovs, 2020; Pranata *et al.*, 2021). The most effective initial step to make this happen is to support and participate in the National Disaster Management Agency (BNPB) program to create a Disaster Preparedness School (Pranata *et al.*, 2021).

Disaster preparedness school is a school-based program in order to build community preparedness for potential disasters in Indonesia in general and in PES 1 Banyuroto, Sawangan in particular. This program aims to raise awareness of all elements, both individually and collectively in the school environment so that they understand and are ready to face a disaster that might occur (Amri *et al.*, 2017; Sari, 2019).

Disaster Risk Reduction at the school level is one of the aspirations to build and develop a disaster-resilient community that can be accepted as an educational product that generates awareness and behaviour that is supported by an institutionalization process in the wider system to jointly build a culture of safety. and toughness (Amri *et al.*, 2017; Sari, 2019). By involving the world of education in efforts to reduce disaster risk, it is hoped that it will be able to build the behaviour of the school community and society in dealing with disasters.

GENERAL DESCRIPTION OF THE COMMUNITY, PROBLEMS AND TARGET SOLUTIONS

General description

PES 1 Banyuroto, Sawangan, Magelang, Central Java is located in an area prone to volcanic eruptions and earthquakes. Training and simulation on disaster risk management at PES 1 Banyuroto is very important given its location close to Mount Merbabu and Mount Merapi. Schools have a social function in organizing school members to build disaster awareness. To form this preparedness, teachers and students are the most important components to play an active and participatory role in disaster preparedness efforts at the school level. Teachers and students need to receive effective training so they can play a role in reducing disaster risk and the Disaster Preparedness School Program is implemented in an integrated and sustainable manner

Problem

Schools are often used as the locations for disaster victims to evacuate. However, school elements have never had disaster management training. In addition, disaster management equipment is not yet available in PES 1 Banyuroto.

Target solution

Teachers and students need to receive effective training so they can play a role in reducing disaster risk and the Disaster Preparedness School Program is implemented in an integrated and

p-ISSN: 2580 5282
e-ISSN: 2580 5290
DOI: 10.33086/cdj.v7i2

sustainable manner.

METHOD

The implementation of this community service is by training 60 teachers, employees and students of PES 1 Banyuroto to be prepared as disaster preparedness school cadres. The implementation of community service activities is as follows:

1. Meeting with Banyuroto PES 1 Principal and Teachers.
   In building disaster preparedness schools, two main criteria must be met, namely structural and non-structural preparedness. Structural preparedness is indicated by the availability of physical means for self-rescue and evacuation. Non-structural preparedness consists of; knowledge and attitudes, policies and guidelines, emergency response plans, disaster warning systems, and resource mobilization. Because disaster preparedness schools are the responsibility of all parties, it is necessary to hold discussions and presentations to school policy makers, in this case the school principal, teachers and school committees to build an understanding of the importance of the disaster preparedness school cadre program to support the next disaster preparedness school program. can be stated in the school policy.
   At this stage, the Team coordinated directly with the School Principal and student affairs on June 11, 2022. At the meeting, the Team presented plans for training teachers, cadres and school students on disaster preparedness and discussed the importance of the program. PES 1 Banyuroto welcomed the training plan and suggested that the activities be carried out during the August school activities. The results of the meeting were followed up by sending a written application for permission to carry out the training to PES 1 Banyuroto.
2. Coordination and cooperation with the Regional Disaster Management Agency for the implementation of the Disaster Preparedness School program at PES 1 Banyuroto.
   Disaster preparedness schools can be realized by involving all school components, especially school principals, teachers, students and other school members. In addition, the need for cooperation with the Regional Disaster Management Agency as a representative of the government. Given the importance of support and guidance from parties outside the school in building disaster preparedness schools. At this stage, the Service Team sends a letter of request for sources from the institution mentioned above.
3. Selection/recruitment of teachers, staff and students for disaster preparedness school cadres
   Teachers, employees and students of Disaster Preparedness Cadres are those who are responsive to changes in the situation in their environment caused by natural disasters. Therefore, the selection of "cadres" is a step that must be done. At this stage, the Service Team coordinates with the school principal to select teachers, employees and students who will be included in the training, with the criteria of students having leadership characteristics, courage, independence, agility and energy. In addition to these criteria, other characteristics such as being willing to voluntarily help others, having stable emotions, and having a fairly good or at least average learning achievement, are other criteria used as the basis for selecting training participants. After the discussion, 80 cadres were to be included in the training.
4. Training for disaster preparedness school cadres
   The training will be held on 22-24 August 2022, at PES 1 Banyuroto. The training was held from 07.30 - 12.00 WIB. The details of the training materials are as follows:
   a. Introduction to materials on disasters and disaster preparedness

p-ISSN: 2580 5282
e-ISSN: 2580 5290
DOI: 10.33086/cdj.v7i2

To be able to carry out training as disaster preparedness cadres, a series of training needs to be provided. The cadres who were selected as volunteers were gathered and held a meeting. During the meeting, it was explained about the training that would be carried out, and asked again who was ready to continue participating in the training. The main objective of the training is to provide knowledge about disaster management in schools so that they are able to use these skills when a disaster occurs. Schools can start by providing disaster materials, especially school environmental safety. Teach students to observe the environment of the school building and yard and reduce the hazards that may occur. It is important to raise awareness of cadres about the threats that might occur in the event of a disaster. Other material that will be delivered is standard procedures for emergency response such as wound care, suturing the wound and taking it to a safe place. The training material provided is so that disaster preparedness cadres can practice it during simulation exercises, then can convey this information to the wider community later.

b. Reinforcement Material on Basic Life Support/Emergency First Aid
In addition to basic disaster concept materials, disaster preparedness school cadres are also equipped with basic emergency assistance materials. The material provided includes an introduction to the victim's condition, basic life support (cardiopulmonary resuscitation), head and bone trauma, dressings, lifting and transporting the victim.

c. Disaster Drill
The disaster simulation exercise aims to train the readiness of school members in responding to disasters before, during and after a disaster. Disaster simulation exercises are also useful for assessing school deficiencies in dealing with disasters. This disaster drill was attended by all training participants and selected students. The disaster simulation exercise is focused on earthquake simulation. This simulation process focuses on self-evacuation techniques and groups. In this activity, the Team created a disaster scenario that suddenly occurred at school, namely an earthquake. In the first stage, the Team informed them of a sudden earthquake and announced all students to leave the building. The team didn't tell any of the students what to do. After everyone came out and gathered in the field, the team discussed in general with all students the weaknesses in earthquake evacuation. Then the team gave an explanation about the signs of a disaster and the correct evacuation technique. After giving the explanation, the students were again given a disaster scenario, and the result was that the second evacuation technique of all students was better and faster. And after the disaster drill, a demonstration of emergency measures was carried out for earthquake victims with a scenario of earthquake victims with injuries, fractures, head injuries, and loss of consciousness. By carrying out disaster simulation exercises, school members (teachers, students) and other related parties can use the actual conditions of schools and buildings to practice responding to given disaster scenarios. Starting from evacuation to post-disaster stabilization. Based on this disaster simulation exercise, a disaster response plan was created, such as making evacuation route signs and gathering point signs for school residents in the event of a disaster.

RESULTS AND DISCUSSION

Introduction to materials on disasters and disaster preparedness

p-ISSN: 2580 5282
e-ISSN: 2580 5290
DOI: 10.33086/cdj.v7i2

Before carrying out a disaster preparedness simulation, it is certain that participants understand several important things related to the description of a disaster. The materials introduced are: 1) disaster preparedness school standards; 2) why is PES 1 Banyuroto a priority in disaster preparedness schools; 3) types of disasters; 4) the cause of the disaster. UU no. 24 of 2007 defines a disaster as a series of natural or non-natural events that threaten and disrupt human life (Mahendradhata *et al.*, 2017; Pascapurnama *et al.*, 2018). Types of disasters can be classified into 3 categories, namely: 1) natural disasters (caused by natural events: earthquakes, tsunamis, landslides, volcanic eruptions, floods, tornadoes, droughts, extreme weather & high tides) (Chowdhury and Chakraborty, 2017); 2) non-natural disasters (caused by non-natural events: epidemics, disease outbreaks, technological failures, forest fires & settlements); 3) disasters caused by human factors (social conflict, terror, war, radicalism) (Khairul Rahmat *et al.*, 2020). Various impacts that can be caused by the above disasters include: loss of life (due to cardiac & respiratory arrest, bleeding, buried, burnt, drowned etc.), environmental & ecosystem damage, loss of property & family members, psychological & psychological victims, and post-disaster disease outbreaks (Benevolenza and DeRigne, 2019; Panjaitan, 2021).

The Indonesian National Disaster Management Agency (BNPB) released data showing that a total of 2,168 types of disasters have occurred during the period January-August 2022 (Mahendradhata *et al.*, 2017; BNPB, 2018). . The report also describes 423 educational facilities affected by the disaster. The National Statistics Agency also explained that 75% of educational facilities at the elementary to high school level are located in disaster-prone locations. As one of the educational facilities in Central Java province, PES 1 Banyuroto Magelang is a school that is included in the category of high risk of being affected by a disaster, because it is located on the slopes at the foot of Mount Merbabu and Merapi. In an effort to prevent and manage school disasters, the Ministry of Education and Culture initiated the Disaster Safe Schools (SAB) program in 2019. However, until now PES 1 Banyuroto has not been exposed to information regarding the SAB program. SAB is a school that implements standard infrastructure and habits that are able to protect school residents and the surrounding environment from disasters. In its implementation, SAB implements 3 basic pillars: 1) Provision of safe school facilities; 2) building preparedness behavior with school disaster management; and 3) providing education related to disaster risk prevention & reduction. The main targets and objectives of SAB are protecting students & school members from the risk of death & injury from disasters, strengthening the resilience of school members, and planning disaster education on an ongoing basis (Panjaitan, 2021). Evacuation is described as an act of moving/moving individuals away from threats or dangerous/life-threatening events to a safer place. (Panjaitan, 2021). Evacuation is carried out in the event of a natural disaster or specific event such as an accident, terror attack, bomb, fire, epidemic, etc. Evacuation aims to prevent additional victims, save victims, and facilitate the search for victims. Evacuation is classified as: 1) emergency evacuation (the incident location endangers helpers & victims); 2) non-emergency evacuation (the incident location is not life threatening to rescuers & victims). Emergency evacuation can be done by pulling (clothes, blankets, arms, cloth), crawling, and shoulder-slung methods. Non-emergency evacuation can be done by direct lifting method (Lindell, 2011).

Evacuation material was also delivered specifically when an earthquake occurred (principles of calm, take shelter, & survive), fire (principles: stay calm, stay away from sources of fire, suppress a fire, run to the evacuation route with ladders, & duck), threats of violence and extreme weather

p-ISSN: 2580 5282
e-ISSN: 2580 5290
DOI: 10.33086/cdj.v7i2

(principles : lock yourself in a secure room).

Strengthening material on Basic Life Assistance/Emergency First Aid

In a disaster situation, basic life support (BHD) is termed first aid to victims with cardiac & respiratory arrest before being treated by medical personnel. The goal of BHD is to maintain a person's life within 1-5 minutes of critical conditions after cardiac & respiratory arrest so that the body's important organs continue to receive oxygen and blood supply. According to the 2020 AHA update, BHD can be performed by the "D-R-S-C-A-B" chain sequence method. 1) D-Danger (ensure the safety of helpers, victims & the environment); 2) R-Response (checking the victim's conscious response by calling, clapping, or pain stimulation); 3) S-Shout for help (shouting for help to contact the medical team or to bring an automatic cardiac shock device); 4) C-Chest Compression (carving the heart with a depth of 5-6 cm in the middle below the mid-chest bone with a ratio of 1 cycle: 30 heart pressure & 2 rescue breaths for 5 cycles, if the victim has a cardiac arrest and breathing has previously been checked with feeling the victim's neck for pulse and breathing); 5) A-Airway (opening the airway with a head tilt-chin lift, or jaw trust); 6) B-Breathing (giving rescue breaths through the mouth with a protective device 10 times/minute for 2 minutes if the victim has stopped breathing). Then evaluate every 2 minutes by feeling the victim's neck pulse & respiratory status. If the victim's pulse & respiration are adequate, position the victim on a steady side while waiting for medical assistance to arrive (Virani *et al.*, 2020).

Figure 2. Strengthening material on Basic Life Assistance/Emergency First Aid

Simulation activities were carried out on the second day. After teams understand their respective roles and tasks, the next stage is a simulation of disaster mitigation activities, in this case, an earthquake disaster.

CONCLUSIONS AND SUGGESTIONS

Training and simulation on disaster risk management at PES 1 Banyuroto are essential given its location close to Mount Merbabu and Mount Merapi. Schools have a social function in organizing school members to build disaster awareness. To form this preparedness, teachers and students are the most important components to play an active and participatory role in disaster preparedness efforts at the school level. Teachers and students need to receive effective training so they can play a role in reducing disaster risk and the Disaster Preparedness School Program is implemented in an integrated and sustainable manner.

AKNOWLEGMENT

We Would like to thank any parties who help with the implementation of this activity.

p-ISSN: 2580 5282
e-ISSN: 2580 5290
DOI: 10.33086/cdj.v7i2

REFERENCE

Amri, A. *et al.* (2017) 'Disaster risk reduction education in Indonesia: Challenges and recommendations for scaling up', *Natural Hazards and Earth System Sciences*, 17(4), pp. 595–612. doi: 10.5194/nhess-17-595-2017.

Benevolenza, M. A. and DeRigne, L. (2019) 'The impact of climate change and natural disasters on vulnerable populations: A systematic review of literature', *Journal of Human Behavior in the Social Environment*, 29(2), pp. 266–281. doi: 10.1080/10911359.2018.1527739.

BNPB (2018) 'Data dan Informasi Bencana Indonesia, BNPB, < http://dibi.bnpb.go.id/ > (diakses 1 Desember 2019).'

Chowdhury, S. and Chakraborty, P. pratim (2017) 'Universal health coverage - There is more to it than meets the eye', *Journal of Family Medicine and Primary Care*, 6(2), pp. 169–170. doi: 10.4103/jfmpc.jfmpc.

Khairul Rahmat, H. *et al.* (2020) 'Upaya Pengurangan Risiko Bencana Melalui Pelibatan Penyandang Disabilitas Di Indonesia: Sebuah Tinjauan Kepustakaan Disaster Risk Reduction Efforts Through Involvement of People With Disabilities in Indonesia: a Literature Review', *Jurnal Manajemen Bencana (JMB)*, 6(2), pp. 55–64. doi: 10.33172/jmb.v6i2.623.

Lindell, M. (2011) 'Orgins of disaster studies', *Sociopedia*, pp. 1–18. doi: 10.1177/205684601111.

Mahendradhata, Y. *et al.* (2017) *The Republic of Indonesia Health System Review*.

Panjaitan, V. E. (2021) 'Jurnal Tata Sejuta STIA MATARAM', *Jurnal Tata Sejuta Vol*, 7(1), pp. 1–23. Available at: http://ejurnalstiamataram.ac.id/index.php/tatasejuta/article/view/218.

Pascapurnama, D. N. *et al.* (2018) 'Integrated health education in disaster risk reduction: Lesson learned from disease outbreak following natural disasters in Indonesia', *International Journal of Disaster Risk Reduction*, 29(March 2017), pp. 94–102. doi: 10.1016/j.ijdrr.2017.07.013.

Pranata, S. *et al.* (2021) 'How to Prepare a School Based Disaster Preparedness in Indonesia', 33(ICoSIHSN 2020), pp. 528–533.

Rokhmah, D., Khoiron, K. and Burlakovs, J. (2020) 'Knowledge, atttitude, and action of community in disaster preparedness at the slope of Semeru Mountain, Indonesia', *Annals of Tropical Medicine and Public Health*, 23(3), pp. 34–43. doi: 10.36295/ASRO.2020.23313.

Sangkala, M. S. and Gerdtz, M. F. (2018) 'Disaster preparedness and learning needs among community health nurse coordinators in South Sulawesi Indonesia', *Australasian Emergency Care*, 21(1). doi: 10.1016/j.auec.2017.11.002.

Sari, A. L. (2019) 'School in Earthquake Threat : School Based Disaster Preparedness Model in', (February). doi: 10.20944/preprints201902.0253.v1.

Virani, S. S. *et al.* (2020) *Heart disease and stroke statistics—2020 update: A report from the American Heart Association*, *Circulation*. doi: 10.1161/CIR.0000000000000757.