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Assistance in the Preparation of the Cikole Village Disaster Risk Reduction Handbook

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Abstract.

West Java Province is one of the provinces in Indonesia that is prone to earthquakes. There are three faults that stretch across West Java, namely the Cimandiri Fault, the Lembang Fault, and the Baribis Fault. The Lembang Fault is a geological phenomenon located in the north of the Bandung Basin, stretching from the eastern part of Mount Manglayang to the western part of Parongpong-Csarua through the city of Lembang, for 22 km. The morphology along the Lembang Fault includes active tectonics which can cause large earthquakes in the surrounding area. Among them is Cikole Village, Lembang District. Initial search results show that the people of Cikole Village still have low-disaster risk reduction efforts. Increasing preparedness is one of the important elements of proactive disaster risk reduction activities before a disaster occurs. The priority problem that needs to be addressed through mentoring activities is to increase community preparedness through the preparation of guidelines in the form of a disaster risk reduction handbook. The method used in this activity is community involvement through focus group discussion (FGD). The developed pocketbook measures 7.4 x 10.5 cm and is designed with the dominant color orange. Because orange color denotes alert or ready. The contents of the book include disaster threats in Cikole Village and a guide to disaster preparedness for earthquakes and volcanic eruptions.

Keywords: disaster risk reduction, handbook, Sesar Lembang

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1. Introduction

West Java Province is one of the disaster-prone areas in Indonesia with the number of disaster events being ranked 3rd in the nation. Several natural disasters occurred in West Java, Landslides, Earthquakes, Floods, Droughts, Quail, Tidal Waves, Fires, Other Disasters, Volcanoes Erupting, and Tsunamis [1]. West Java is on the path of tectonic earthquakes because the base forming the mainland of West Java is part of the Eurasian plate that collides with the Indo-Australian plate. Three faults stretch across West Java: the Cimandiri Fault, Lembang Fault, Garsela Fault, and Baribis Fault [2]. The Lembang Fault is located north of the Bandung Basin, stretching from the eastern part of Mount Manglayang to the western region of Parongpong –Cisarua, passing through the city of Lembang, for 22 km. The morphology along the Lembang Fault is classified as active tectonics which is influenced by the tectonic activity of the Lembang Fault. [3]. The Lembang Fault is still reasonably active when viewed from a seismological point of view, as evidenced by the earthquake that occurred with a small strength. The earthquake occurred in the west and east ends. During the 2009-2015 period, four earthquakes have been identified along the Lembang Fault [4].

Based on LIPI Geotechnology research, the Lembang Fault is not straight but splits at several points so that the potential strength of the earthquake can vary. If only one part is shifted, the resulting earthquake will be small. However, if all fault segments move together, it is predicted to trigger an earthquake of up to 6.9 MW [5]. The movement of the fault can not be predicted when it occurs, so to minimize the impact it needs to be anticipated. In the West Bandung Regency Spatial Plan, the area located around the Lembang Fault is included in the Geological Natural Disaster Prone Area with an area of 196 ha spread over Lembang, Parongpong, and Cisarua Districts.. One of the villages that are threatened by the impact of the disaster due to the shift of the Lembang Fault is Cikole Village, Lembang District. This village in addition to having a disaster threat due to the activity of the Lembang fault, is also located in the area of the Tangkuban Perahu Volcano which is still active. Cikole Village is included in the Disaster Prone Area I which has the potential to be hit by lahars.

Previous studies on disaster mitigation have discussed in general about landslide disasters [6]. This research complements previous research. Research on landslides has been carried out by looking at the character of the disaster itself [7], then there is also disaster mitigation planning using geographic information systems [8], to carry out disaster education through handbooks [9]. Research on determining evacuation routes and gathering points in Cikole Village itself is a follow-up study from previous

studies. The research began with the establishment of a disaster-resilient women's forum to empower the community in Cikole Village in the context of disaster mitigation [10]. Then proceed with research on the preparation of a strategic plan for a disaster-resilient women's forum which aims to provide an overview of the framework for dealing with disasters [11]. In addition, it is also continued with research on women's strategies in Cikole Village in dealing with disasters [12], as well as innovations that need to be carried out on a gender basis [13].

The results of the initial survey show that the people of Cikole Village still have low disaster preparedness. Meanwhile, preparedness is part of the disaster management process that develops in the concept of disaster management, especially efforts in pre-disaster disaster risk reduction activities [14]. Several disaster preparedness programs in Indonesia are mostly launched after a disaster occurs, the program is curative/reactive, not preventive. Whereas preventive programs will minimize the impact of natural disasters. Reactive disaster management will not be effective in reducing disaster risk. People still panic when a disaster occurs, don't know what to do, & how to save themselves [15].

Disaster risk reduction is used to predict and prevent disasters, mitigate the impact of disasters on populations, and respond and deal effectively with the impacts of disasters. Increased preparedness is one of the important elements of pro-active disaster risk reduction activities before a disaster occurs [16]. Disaster Risk Reduction (DRR) aims to reduce the damage caused by natural hazards like earthquakes, floods, droughts and cyclones, through an ethic of prevention [17] . Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and reduce the causal factors of disasters. Reducing exposure to hazards, lessening vulnerability of people and property, wise management of land and the environment, and improving preparedness and early warning for adverse events are all examples of disaster risk reduction. According to LIPI and UNESCO, 2006 [18], it is stated that there are five parameters to measure the level of disaster risk reduction. One of them is policy and guidelines.

Policies and guidelines are concrete efforts to carry out disaster preparedness activities. Policies can be realized in various forms, but they will be more meaningful if they are concretely included in regulations. For policies to be implemented optimally, operational guidelines are needed, for example in the form of a Handbook. Currently, the Disaster Risk Reduction guide has been published by BNPB (Badan Nasional Penanggulangan Bencana) in 2019. There is no Handbook in the local scope that focuses on discussing community preparedness guidelines for disasters that specifically

occur in Cikole Village. This study aims to produce a disaster risk reduction handbook that is in accordance with the conditions of disaster-prone locations and becomes a handbook that is applicable and easily understood by the people of Cikole Village so as to improve disaster preparedness. This handbook brings some institutional knowledge and information together in order to help enhance the disaster management capacity of the communities in Cikole Village and reduce disaster risks caused by hazards such as Earthquakes and Volcanoes Erupting. This study aims to produce a disaster risk reduction handbook that is in accordance with the conditions of disaster-prone locations and becomes a handbook that is applicable and easily understood by the people of Cikole Village so as to improve disaster preparedness.

2. Methodology

There are four stages of activities in the preparation of the Cikole Village Disaster Risk Reducing Handbook, including preparation stage, survey stage, book layout stage, Focus Group Discussion stage, and final stage. At the preparation stage, team consolidation, methodological preparation, survey preparation, and identification of handbook outline needs were carried out. Followed by the data collection stage. There are two survey methods carried out, the first is a survey at the relevant agency to find data on disaster conditions. Second, field observations to map evacuation routes and disaster gathering points. The survey activity ended by collecting data and sorting out the appropriate data to be processed at a later stage. At the analysis stage, data processing activities are carried out in the form of a temporary Handbook. The results of the temporary handbook were then socialized in the Focus Group Discussion to gather input on the contents of the handbook and also to formulate evacuation routes and disaster gathering points with the Cikole Village community. Evacuation routes and gathering points are one of the topics in the handbook. The final stage is the finalization and distribution of the disaster risk reduction handbook to representatives of the Cikole Village community.

3. Result and Discussion

3.1. Cikole Village Disaster Threat

There are 2 disasters that threaten the people of Cikole Village, namely Earthquakes and Volcanic Eruption. Based on data from BPBD West Bandung Regency, All hamlets

in Cikole Village are included in the High-scale Earthquakes hazard class with a total area of 469.54 ha.

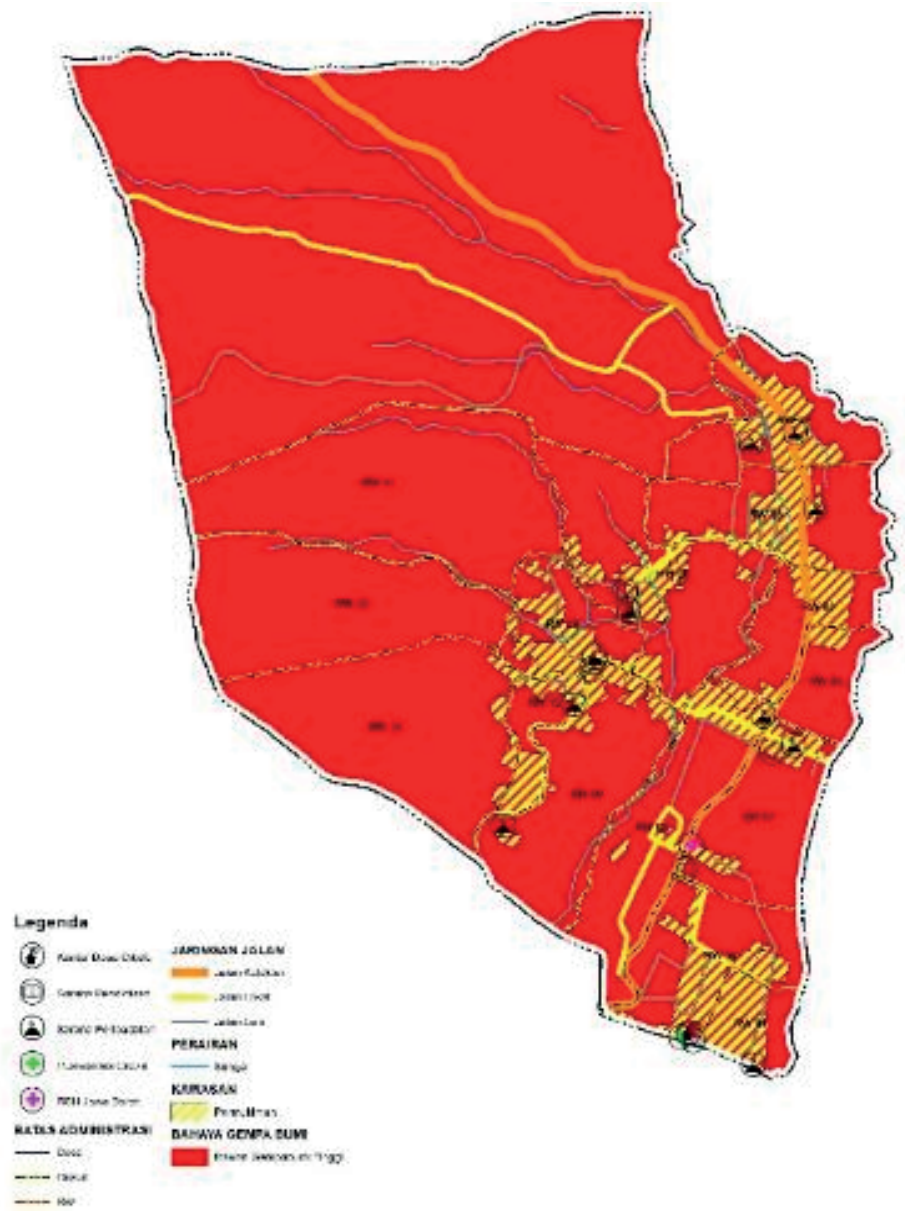

Figure 1: Cikole Village Earthquakes Hazard Map.

Meanwhile, based on the Tangkuban Parahu Volcano-Prone Area Map from the Directorate of Volcanology and Geological Hazard Mitigation, Cikole Village is included in Disaster Prone Area I and has the potential to be affected by lahars. Precisely on the southeast slope, settlements along the Cikole or Cibogo River. Disaster-Prone Area I is an area that has the potential to be affected by lahars, falling material in the form of ash rain, and water with a high acidity level. If the eruption enlarges, this area has the potential to be exposed to the expansion of hot clouds and falling material in the form

of heavy ash rain and the hurling of incandescent stones. This area is divided into two, namely:

1. Areas are prone to lahars. This area is located along valleys and riverbanks, especially those that originate in the peak area.
2. The area is prone to ash rain regardless of the direction of the wind.

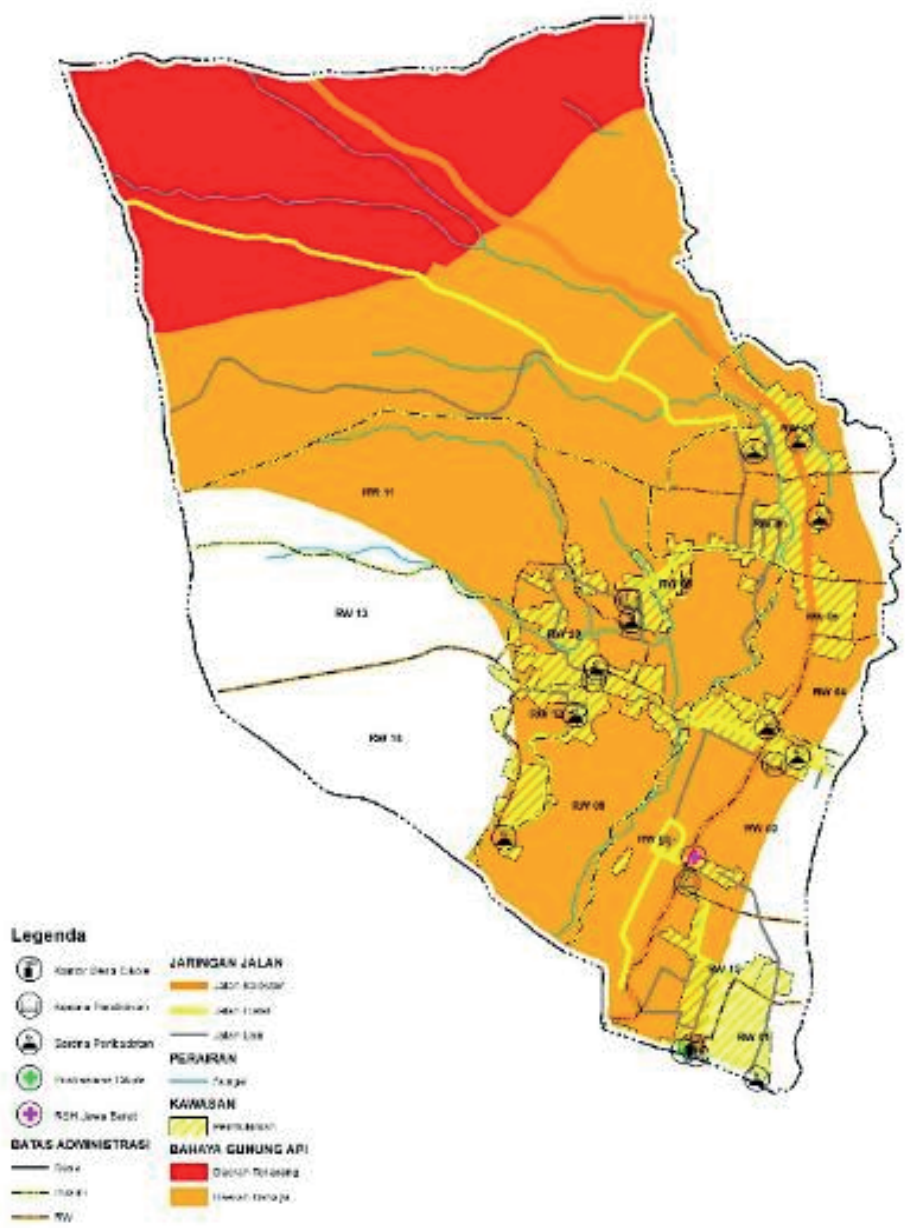

Figure 2: Cikole Village Volcano Eruption Hazard Map.

3.2. Formulation of Handbooks, Evacuation Paths, and Disaster Gathering Points with the Community

One form of disaster risk reduction plan is the community's understanding of evacuation routes and gathering points. The evacuation route is also one of the contents that must be in the handbook. However, no clear identification of evacuation routes was found in related institutional documents or policies. This also causes public ignorance about which evacuation route they should take in the event of a disaster. So in this activity, a participatory evacuation route map was also prepared by taking into account the opinions of residents as the main input in planning. In addition, with the direct involvement of the community in making the evacuation route map, the community's understanding of the condition of the area will increase so that the community knows what the needs of the area are [19].

Gathering points and evacuation routes were formulated in the Focus Group Discussion along with the socialization of the temporary handbook. Mapping of evacuation route signs and gathering points was carried out by field observation. The data from the observations became the basis for making an initial map of the existing evacuation route, which will be used in the Focus Group Discussion. Based on the results of field observations, there are 6 evacuation route signs scattered in several hamlets, 2 disaster gathering points, and 2 evacuation posts. The existing meeting points are at the Cikole Graphics Parking Lot and Cikole Village Hall. Meanwhile, those that are directed to become refugee camps are the West Java Animal Hospital and the Cikole Village Hall.

Figure 3: Temporary Handbook Socialization & Formulation of Disaster Evacuation Scheme with The Community.

There are no specific parameters used in determining the optimal evacuation route. The existing parameters are indirectly explained in the reasons for choosing the evacuation route expressed by the community, namely the condition of the existing road network and the habit of passing through the road. Some of the considerations for determining the evacuation route include: Don't cross the bridge, don't cross the river, don't approach the source of danger, road network availability, the direction of the

road, dan habit of going through that route. While the considerations for determining the gathering point are Easy to reach, barrier free, at a safe distance from danger, the minimum distance of the assembly point from the building is 20 meters, do not block emergency response vehicles, the gathering point must also be large enough to accommodate the whole person, and can be a road or open space, for example: parking lot. Based on the results of discussions with the community, the village community evacuation scheme is as follows.

Figure 4: Cikole Village Community Evacuation Scheme.

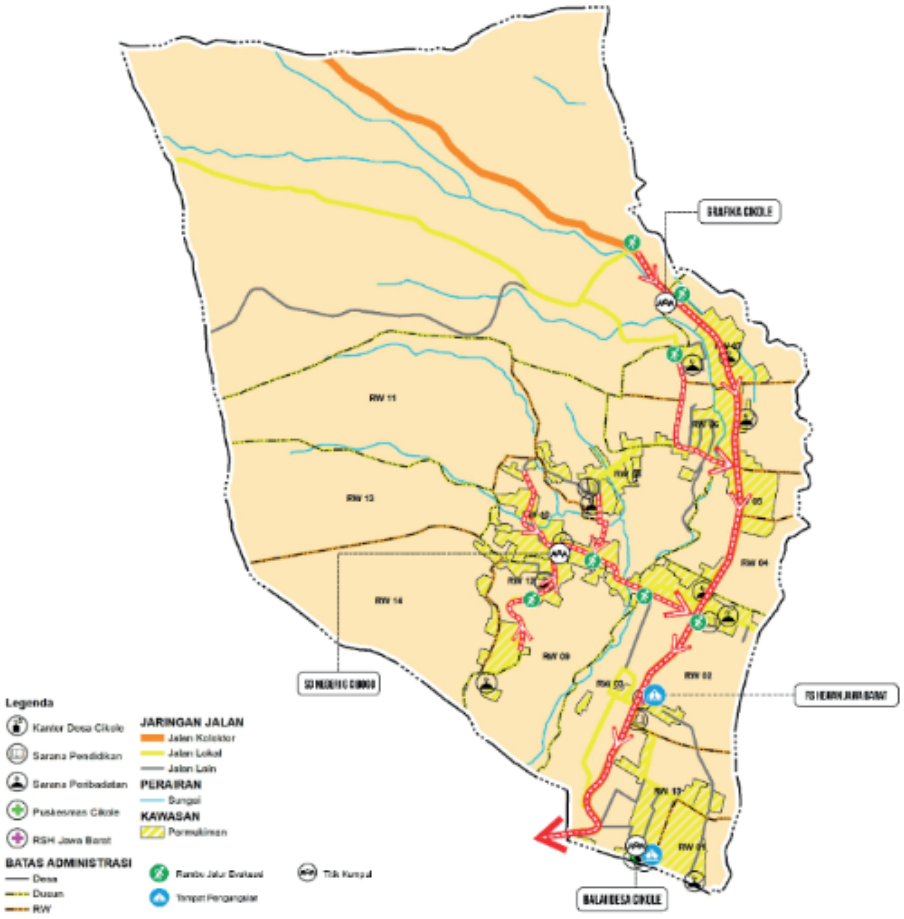

Figure 5: Cikole Village Community Evacuation Map.

Evacuation is carried out to the first gathering point (collection point in each hamlet) then evacuation to the last gathering point (village hall). The path chosen is the path commonly used by the village community on a daily basis. The community also does not differentiate between road classes in lane selection. Meanwhile, the meeting point determined by the village community is a pre-existing meeting point. The form of gathering point is in the form of special buildings, public facilities, and parking lots. The selection of the gathering point is based on the agreement of the residents by looking at the availability of existing land. There are 4 (four) planned meeting points, including the Cikole Graphic Parking Field, West Java Animal Hospital, SDN 6 Cibogo, and Cikole Village Hall. In addition, the West Java Animal Hospital and the Cikole Village Hall functioned as refugee camps.

3.3. Cikole Village Disaster Risk Reduction Handbook

Based on the opinion of the community in the Focus Group Discussion of the temporary guidebook and also the determination of disaster evacuation routes, the next step is to complete the guidebook for Disaster Risk Reduction in Cikole Village. The size of the handbook is 7.4 x 10.5 cm and is made in the dominant color Orange. Because the color has the meaning of alert or ready. The contents of the disaster risk reduction handbook include an introduction, Cikole Village disaster threats, disaster risk reduction plans, disaster preparedness bags, and attachments including a list of applications, disaster information signs, and emergency contacts. The form of the handbook that has been compiled is as follows:

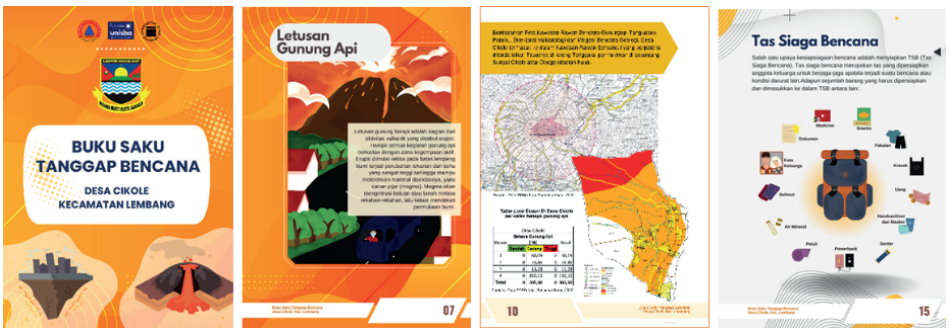

Figure 6: Cikole Village Disaster Risk Reduction.

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