



BUILDING A DISASTER PREPARED VILLAGE COMMUNITY TO REDUCE THE RISK OF A LANDSLIDE DISASTER IN SUMURUP VILLAGE, BENDUNGAN DISTRICT, TRENGGALEK REGENCY

Rizkyah Isnaini^{1*}

¹Magister in Disaster Management at the Postgraduate School of Airlangga University

*E-mail: rizkyah.isnaini-2018@pasca.unair.ac.id

Abstract

This mentoring research describes the reality of people's lives who have low awareness of natural disaster response. The problems that arise in the community are the lack of public awareness in tackling and dealing with disasters, the absence of a disaster emergency response and response system, and the absence of village government policies that focus on managing landslides. The purpose of this empowerment is to find a strategy in building a resilient community for landslide natural disasters to be more independent in handling and preventing disaster events in Sumurup Village.

This study refers to a research approach using the PAR method. Namely making changes in the form of education and training in landslide risk reduction in order to provide a basic understanding of disaster risk reduction by making disaster-prone maps. As well as disaster simulation training accompanied by determining evacuation routes, and installing danger signs. In addition, by advocating village government policies to create funding rules for disaster management. With a series of activities that have been carried out with the community so as to create a strong and independent community attitude in dealing with natural disasters. These activities have resulted in improvements and changes in community capacity, especially for communities directly affected by disasters in reducing the risk of landslides.

Keywords: Empowerment, Disaster Risk Reduction, Landslide

Abstrak

Penelitian pendampingan ini menggambarkan realitas kehidupan masyarakat yang memiliki kesadaran rendah terhadap tanggap bencana alam. Problem yang muncul pada masyarakat adalah kurangnya kesadaran masyarakat dalam menanggulangi dan menghadapi bencana, belum terbangunnya sistem penanggulangan dan tanggap darurat bencana, serta belum adanya kebijakan pemerintah desa yang fokus pada penanggulangan bencana tanah longsor. Tujuan dari pemberdayaan ini untuk menemukan strategi dalam membangun masyarakat tangguh bencana alam tanah longsor agar lebih mandiri untuk menangani dan mencegah kejadian bencana di Desa Sumurup.

Penelitian ini mengacu pada pendekatan penelitian dengan menggunakan metode PAR. Yakni melakukan perubahan dalam bentuk pendidikan dan pelatihan dalam pengurangan resiko bencana tanah longsor guna memberikan pemahaman dasar dalam pengurangan resiko bencana dengan membuat peta rawan bencana. Serta pelatihan simulasi bencana disertai dengan penentuan jalur evakuasi, dan pemasangan rambu-rambu tanda bahaya. Selain itu dengan advokasi kebijakan pemerintah desa agar menciptakan aturan pendanaan untuk penanggulangan bencana. Dengan serangkaian kegiatan yang telah dilakukan bersama masyarakat sehingga mewujudkan sikap masyarakat yang tangguh dan mandiri dalam menghadapi bencana alam. Dari kegiatan tersebut telah menghasilkan peningkatan dan perubahan kapasitas masyarakat yang baik terutama bagi masyarakat yang terdampak bencana secara langsung dalam pengurangan resiko bencana tanah longsor.

Kata kunci: Pendampingan, Pengurangan Resiko Bencana, Tanah longsor



1. INTRODUCTION

The East Java region of Trenggalek Regency is a disaster-prone region, even the Daertah Disaster Management Agency (BPBD) of Trenggalek Regency said that Trenggalek was a "supermarket" disaster. This is because various types of events in this region occurred in the last decade. Landslide disaster. Earthquakes, flash floods, droughts, even forest fires have never occurred in this district.

Trenggalek region is indeed an area that is quite vulnerable to disasters. This is seen from the geographic profile of the Trenggalek Regency. Most of it consists of land with 2/3 of the area. While the remaining 1/3 part is land in the lowlands. With the height of the land between 0 to 690 meters above sea level. The area with the largest area and hills is of course very prone to landslides and flash floods. This area is also located in a position adjacent to the Indian Ocean which is a ring of fire. Therefore, this region is very vulnerable to earthquakes and tsunamis, especially Trenggalek in the southern region. However, regions that are very vulnerable to the risk of disasters, do not yet have complex communities designed to overcome financial problems, so that they can increase the level of victims of the disaster.

The basic things that need to be studied are related to disaster victims. The high number of victims caused by a disaster can be avoided, at least minimized, if communities threatened by disasters have preparedness in the face of disasters. Therefore, there needs to be management of Community Based Disaster Risk Reduction (CBDRR). Community-based disaster risk reduction (DRR) is an approach that encourages grassroots communities to manage disaster risk at the local level. These efforts need to be carried out systematically involving the community

actively carrying out the area assessment process, analyzing, preparing themselves, building an early warning system, handling, and evaluating their performance in a participatory manner to reduce disaster vulnerability and strengthen its ability to cope with disasters. The pattern of DRR approaches through the community is an effective pattern, because the community is the party that most bears the risk of disasters. Likewise the community has knowledge, experience, even local wisdom in dealing with disasters. (Jonatan LASSA, 2009: 8) Therefore community resources are the main force in the approach to creating disaster prepared communities.

Based on the description above, then the focus of the problem in the disaster learning process is as follows, namely:

1. Community perceptions of landslides and the vulnerability of the Sumurup Village area to landslides
2. The process of finding the right strategy in preparing the Sumurup Village

community to reduce the risk of landslides that it is facing,

3. The learning process sees changes in the outcomes of community life in order to prepare themselves to reduce the level of risk of landslides.

2. HEADING

2.1. Concept of Disaster Risk Reduction

In disaster management (Disaster management), disaster risk is the interaction between the vulnerability of the area and the danger threat that exists. The level of vulnerability of the region can be reduced, so that the ability to deal with these threats increases the magnitude of the risk of disasters can be expressed in the amount of losses incurred (assets, lives, and injuries) for a certain magnitude of events. Disaster risk in an area depends on several factors



and nature /geography /geology (possible occurrence of hazard phenomena), vulnerability of the community to phenomena (condition and number of buildings), physical vulnerability of the area (condition and number of buildings) and community readiness for emergency response and generally rebuild disaster risk. (I Wayan Cede Eka Saputra, 2013 : 27) In this case it can be formulated as follows:

Source: I wayan Gede Eka Saputra, Disaster Risk Analysis

- a. A threat is an event or event that has the potential to cause damage, loss of life or environmental damage.
- b. Vulnerability of a condition that is determined by physical, social, economic and environmental factors or processes that result in the community's inability to face threats.
- c. Capacity which is the mastery of the resources, methods and strengths of the community that enable them to maintain and prepare themselves to prevent, cope with, reduce and quickly recover from the consequences of the disaster. Thus, the higher the threat, vulnerability and weak capacity, the greater the disaster risk faced as seen in what can be done by the community in reducing disaster risk by recognizing the potential disaster that is a threat.

In the chart, it shows that what is shown in the picture above shows that the higher the level of vulnerability a person has, the greater the disaster risk they experience. Then lower the level of vulnerability of a person, the smaller the risk of disaster experienced. Disaster Risk Reduction efforts are one of the simplest understandings about disasters is a loss of life and life community as an impact of an event caused by natural phenomena or human activity. If a disaster is interpreted like this, then the main goal of disaster management is to prevent or reduce losses

faced by society. The first strategy is to prevent the occurrence, namely by completely eliminating or conducting risk management so that the adverse effects of an event can be reduced or eliminated at all. (I Wayan Cede Eka Saputra, 2013 : 37)

2.2. Approach to Community Based Disaster Risk Management (CBDRM)

Community Based Disaster Risk Management (CBDRM) is a process that involves local communities as those who are most at risk when a disaster occurs in the identification, analysis, monitoring and assessment of disaster risk as an effort to reduce disaster risk and strengthen their capacity. This means that the community becomes the core of decision makers and the application of DRR risk reduction measures. (Abarquez, Imelda, Zubaid Murshed, 2004:17) The involvement of the most vulnerable groups is considered to be the most important process. The CBDRM approach places local communities as vital actors in mitigation, preparedness and recovery actions. Information exchange and local capacity building are very important to ensure that DRR is carried out in the long term.

Some of the concepts of CBDRM are disasters that occur when the impacts of hazards on communities are vulnerable and cause damage, victims and disturbances. Vulnerability is a set of conditions that are valid or consequential, which affect the ability of the community to prevent, reduce, prepare and respond to dangerous events. the capacity of resources, facilities and strengths that exist in the community and that enable them to prevent, reduce and recover quickly from disasters. Disaster Risk allows damage and loss as a result of a hazard. Disaster risk reduction includes all activities to minimize loss of life, assets or assets properly and reduce hazards or reduce vulnerability from various types of disasters that are at risk. The increase in CBDRM is disaster-oriented development as a question of the problems of vulnerable



communities. This value can empower the community to overcome the root causes of vulnerability by changing the social order, economic and political structures that cause diversity. The CBDRM approach includes prevention and mitigation, preparedness, emergency response and recovery. (Shesh kanta kifle and zubair Murshed, 2006:10)

Community involvement is very important because the community is the key to an ongoing involvement in activities to increase community empowerment in disaster risk reduction. Some support from both external institutions, such as the government, non-governmental organizations, is one of the role models that can provide examples of community-level programs before and after a disaster. Therefore it is very important to involve the community in decision making about policies and strategies that must be followed for developments in society. Disasters can become out of control when they are happen. Therefore, precautions and steps need to be taken before, during and after a disaster event. If the community is not ready to control the inside disaster event, the level of risk will be higher. But if each individual in the community in recognizing things or ways in face and take preventive action, then disruption from disasters can be reduced. Active involvement from the community, and stakeholders and the influential apparatus in the chosen environment which thing is very important in a row for deep decision making promoting empowerment and sustainability¹⁹. By building community then relationships and a sense of belonging in the face of threats and disaster risk. Community-based disaster risk management planning, and managed by the community until monitoring and evaluation. (Shesh kanta kifle and zubair Murshed, 2006:10)

3. RESEARCH METHODS

This research and mentoring approach uses the PAR (Participatory Action Research) method. PAR is collaborative

between researchers and the community to conduct joint research, formulate problems, plan actions, carry out actions in a sustainable and sustainable manner. PAR is designed to conceptualize changes and make changes to them. (Agus Affandi, 2016; 91) With the Research and Assistance Procedure as follows: 1) Initial Mapping; 2) Building Humanitarian Relations; 3). Participatory Mapping; 4) Determination of the Research Agenda for Social Change; 5) Determining Humanitarian Problems; 6) Developing Movement Strategies; 7) Community Organizing; 8) Launching Action for Change; 9) Building Community Learning Centers; 10) Reflection; 11) Expand the Support Scale.

The researcher focused on one of the locations in Sumurup Village, namely in Winong Dusun RT 15, which was categorized as a location prone to landslides. The researcher focused on the orientation of in-depth knowledge about mitigation in landslide risk reduction, which will reduce the impact of risks in communities that are affected by landslides.

4. RESULTS AND DISCUSSION

4.1. Disaster-prone natural conditions

Based on the results of the mapping of the facilitator team, together with the community and the Sumurup Village government, it was concluded that the Kaswasan area was a disaster-prone area. This can be seen on the map below:

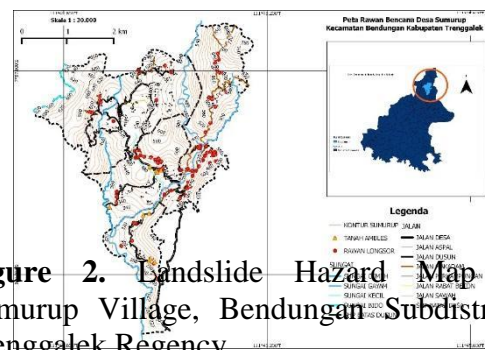


Figure 2. Landslide Hazard Map in Sumurup Village, Bendungan Subdistrict, Trenggalek Regency

From the map above it can be seen that the lands are prone to landslides (red tricycle signs) and prone to land subsidence, (brown triangle signs) are very dangerous.



Tanag is prone to landslides with 79 locations. while the soil is prone to collapse, as many as 10 locations. Therefore, seeing this very large number of disaster-prone locations. then the territory of this region is very prone to natural disasters. If reinforced by the table above, which shows the occurrence of disasters from 1992 to 2016 occurred 6 times and quite a lot of disaster risks, many houses were lost, even one RT was lost, so many victims died, and access to various areas was hampered by infrastructure.

In a joint discussion with village officials and BPD officials there was a fairly complex dynamic. Wito. A community leader in the Pojok Dusun who had experienced a landslide in the

Dusun. directing that the situation they experienced was very frightening. Because in the situation nearing Maghrib, with the rainy weather for 4 hours, they experienced a landslide disaster in 2006. The atmosphere was tense and frightening and the cries of residents who were on RT 10 were inevitable. One landslide hill by displacing 38 houses and 10 houses flattened to the ground, causing nearly 100 people to be injured, and 2 people missing buried in land.

Another thing that is quite sad is that the Winong Dusun community is an area prone to landslides and creepy. This is indeed seen from the Dusun location which is quite vulnerable. Position under a high cliff whose slope is quite sharp and loose soil conditions especially after a long dry season that allows it to be exposed to water if it is exposed to clay, making this location very prone to landslides. Likewise, the position of residential housing is on hill slopes and in the middle of rice fields surrounded by high cliffs and hills. So the waiga position is indeed in the basin that experiences the urgency of the region.

Figure 3. Position of Houses of Residents



JB
DC

h Isnaini

of Winong Dusun RT 15 under the Steep Landslide Prone Hill

This condition was felt by the residents of Winong Dusun, when the rain arrived. At the beginning of the rainy season, residents began to fret, the night could not sleep comfortably. If it rains more than one hour, they will have to evacuate to a safer location. if night doesn't sleep. If it rains for more than one hour. There are 10 houses that have moved from cliffside locations to rice fields. However, the location of the rice fields is also categorized as vulnerable because of its location adjacent to the heavy river, and high cliffs. Their concern is that landslides that occur such as Ponorogo are killed, which are landslides that move a large location, so that even the rice fields will be subject to landslide debris.

The disaster began in 1999 and was experienced by residents of Winong Hamlet with 19 victims and 1 musholla collapsed. This condition also occurred in 2006 which consumed 3 houses that were flat on the ground. The 1999 incident could indeed be overcome by moving locations in mutual cooperation to build a house in the middle of the rice fields in 2000. But this incident also happened again in 2006, along with the incident in Pojok Hamlet which spent 1 RT.

For the incident in 2017, precisely in April, the landslide was quite large, which resulted in 3 houses collapsing (flat to the ground), namely houses belonging to Budiono, Suprianto and Sumadi. As well as the main road (southern part), the Winong hamlet is completely covered due to landslides. In this event, residents took refuge in safer locations. The material loss is certainly quite large, because in addition to the personal losses of three residents, there was also a landslide to close the road access to Winong Hamlet so that all hamlet residents had difficulty accessing. between residents affected by Muspika, BPBD, and the Social Service of Tregalck Regency to talk about this incident. The end result on December 18, 2017 residents made and



submitted a proposal for relocation of houses after the landslide disaster. But the results until now have not been followed up for relocation.

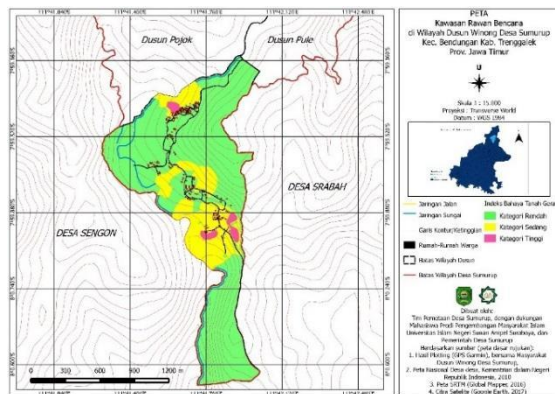


Figure 5. Soil Gerability Vulnerability Map

In the picture above, it can be explained that Winong Hamlet is an area that is included in three categories, namely there are points which are high, low, and low vulnerability. There are four locations of high vulnerability categories and there are also moderate vulnerability areas which are also quite extensive. It should also be noted that both residential and high categories are located in residential areas, so it is very happy for the survival of residents. To strengthen this category, it can also be strengthened by looking at the potential for sustainable motion so far which can also be seen in the history of the disaster above. Less land cover and thin soil make cliffs and the hills surrounding Winong Hamlet prone to erosion and threatened by



landslides. As a result, residents who are in a location below the cliff or around it will be at risk of being affected by a landslide.

Figure 6. The house of the residents of Winong Hamlet which is located under the Landslide-Prone Cliff

Houses under the Cliffs and Prone disaster Landslides. With the discovery of landslide prone points and homes that are prone to landslides, and the potential for this disaster to strengthen, the area of Winong Hamlet in Sumurup Village is indeed very vulnerable. Confusion conditions experienced by hamlet residents. The hope of the proposed relocation did not go down and received a response from the government of Trenggalek District. Whereas if they remain in this vulnerable area they feel uncomfortable, even when there is heavy rain especially at night they feel in a tense condition. What efforts can be made, unless they only pray and beg for no landslide.

4.2. Dynamics Of The Organization Process

4.2.1. Map the Community Landslide Vulnerability Situation

On October 14, 2018 a discussion and mapping of disaster-prone areas was held. In mapping landslide vulnerability the facilitator team is accompanied by the community and village government. In this case because they are the ones who know and understand the characteristics that exist in the region. With the knowledge of these landslide prone points, people can be aware of the natural conditions around them, so that community initiatives will emerge to map safe points to be used as gathering points and more effective evacuation routes when landslides occur. The process of carrying out the mapping of landslide-prone points is carried out as follows

- 1) Tracking and Plotting; this step is the process of tracing landslide-prone points by rotating and marking all areas prone to landslides using Garmin GPS devices. The tracking data of this region will be processed using the Qgis application, so that it will make it easier for people to understand it.

2) Validation and Execution; Whereas after plotting is complete, validation and assessment of the level of vulnerability are carried out at each point considered vulnerable. Validation is carried out jointly through Focus Group Discussion (FGD) activities with the community to ensure that the point is prone to landslides by looking at two aspects, the historical aspects of landslides and aspects of indicators of tendency to landslide. In this validation three categories of vulnerability are agreed, namely low, medium and high.

3) Mapping Social and Vulnerable Groups
This social mapping aims to see the population, distribution of houses and socio-economic conditions in each family. Thus the facilitator team can calculate the number of vulnerable groups in the area, so that when a disaster strikes there is readiness to evacuate specifically to this vulnerable group. the facilitator team conducted a survey with the community and village government.

From the table above, the population in Winong Hamlet is 772 people, with 403 men and 369 women.

4.2.2. Building community perceptions in disaster preparedness

Through the Focus Group Discussion (FGD) activities with the community, the facilitator conducted an equalization of the perception of the concept of disaster preparedness community intended to build understanding between residents about preparedness in dealing with the threat of landslides. In the face of disaster threats, preparedness is the key to public safety. Preparedness is a series of activities to anticipate disasters through organizing and through appropriate and efficient steps.



Figure 7. The atmosphere of the FGD analyzed the disaster history of the Winong Hamlet

Figure 8. The atmosphere of the FGD analyzed the disaster history of the Winong Hamlet

In social life a system of togetherness needs to be built to deal with unexpected situations, namely disasters. Institutions and social systems need to be



built that create a life that is responsive and alert in facing the emergence of disasters. Because if the social order is not built by a system and institution that is ready to deal with disasters, then if a disaster occurs it will take many victims, even the recovery process will be more complicated and long. This is due to the unpreparedness and inability of the community to seek disaster management or to minimize the emergence of victims. This inability is caused by the community's lack of understanding of the concept of disaster preparedness. The facilitator made several efforts to prepare the community in dealing with disasters, as follows:

- 1) Understand the dangers that can occur around the place of residence and community activities,
- 2) Understand the local early warning system,
- 3) Have the skills to evacuate the situation quickly and take action initiatives to protect themselves,
- 4) Have an anticipation plan for the occurrence of family-based disasters, and practice the plan with practice

- 5) Reducing hazard threats through disaster mitigation exercises,
 - 6) Get involved by participating in training
- #### 4.2.3. Designing a Landslide Disaster Simulation Strategy

Before the discussion participants provide what should be prepared during the simulation, the discussion begins with understanding what and how about the landslide disaster. Thus the community can understand the facts in the causes of landslides. That the hillside as far east as Winong Hamlet is morphologically a slope that has a very steep slope and rock conditions found on a very large slope.



Figure 9. Discussion Atmosphere Planning Simulation



Figure 10. Evacuation

The facilitator explains about the things that are provided and carried out before the occurrence of the disaster, including; 1) preparation of sirens to notify the environment when landslides occur, 2) avoid disaster-prone areas to build settlements and other major facilities, 3) build buildings with strong foundations, and make soil compaction around the house, 4) relocate if it has been suggested or needed , 5) reducing the level of surface and ground water slope, 6) when the rainy season arrives, try to maintain it alternately with family members or neighbors. Most

landslides occur at night when people fall asleep. 7) prepare an evacuation place or shelter that is safe and easy to reach.

From these explanations, the residents agreed that for the first thing about sirens as notification of disaster events prepared kentongan or traditional o'clock instruments which facilitate notification to the surrounding community.



Figure 11. Kentongan as a Communication Tool for Disasters

The next activity was the blocking of signs which were independently made together with the facilitator team and the residents, not using professional staff from the printing press. Only the procurement of goods that use materials in the nearest building store. There are four types of signs needed, namely: signs for evacuation routes, disaster prone warning signs, gathering point signs, and SOP explanation boards when disaster emergencies. Then the installation of signs is done together by the community.

The SOPs formed jointly by the facilitator team and the community are as follows:

- 1) Don't panic, secure yourself and your family to the location of the gathering point (Musholla RT 15, Masjid RT 14, and Watu Jago)
- 2) Turn off electricity, stove and water before leaving the house
- 3) Bring disaster alert bags containing: drinking water, snacks, flashlights, clothes, medicines, and important documents.
- 4) Contact the assignment by telephone 119 or 082244749096
- 5) Don't act alone on help
- 6) Do not go back to the location of the disaster, be aware of aftershocks



- 7) Help the victim, prioritize the seriously injured
- 8) Do not be easily provoked by issues, wait for information from the authorities to carry out further activities
- 9) Do not disturb the officer who is giving help and evacuating the victim.

Before the simulation activities, facilitators and the community conducted coordination with the Village Government, Regional Disaster Management Agency in Trenggalek Regency, Bendungan Sub-District Rapid Reaction Team, Sumurup Village Disaster Preparedness Team, and Village Midwives, to participate in supporting disaster simulation activities in Winong Hamlet.

4.2.4. Implementation of Participatory Action

The implementation of the landslide simulation activities was carried out starting at 13:15 ended at 3:35 p.m. led by a team of facilitators, supported by the BPBD Team of Trenggalek Regency, the Bendungan Sub-District Rapid Response Team, the Sumurup Village Apparatus, and the Sumurup Village Tagana Team and participated in by 200 residents in Winong Hamlet which consists of parents, mothers, and even children. Their full involvement is part of their concern for the safety of their lives and physical assets for the threat of the landslides they face.

The event began with an opening by the facilitator team, and continued with a general explanation and remarks from the BPBD Team of Trenggalek Regency namely Agung. After the technical explanation is followed by simulation activities and followed by evaluation and dialogue with the TRC BPBD, the Village Head and the facilitator together with the residents' questions and answers about the things that are likely to happen, and the Anticipation Technique.

In this simulation activity, the facilitating team has divided the tasks and roles to the community, including as a

coordinator, helper for vulnerable groups (pregnant women, children, elderly and disabled), injured victims, and the role of citizens who bring some of their assets objects they have. In the first technique, it was done by sounding the kenthongan first, then the community walked to the location of the gathering point which was safer. Some people have gone to the meeting point, Teguh as the coordinator calculates the number of people who are brada in their villages to do the viewing of their residents. Each member group was declared complete and subsequently reported to the Village Head and Tagana that residents were declared safe and complete. Only 3 people were lightly injured.

For residents who experience minor injuries, they are directly handled by the authorities, namely health workers from Sumurup Village Health Center.



Figure 12. Community Joint Disaster Simulation Activities,2019)

After the activity was finished, the event ended with a closing prayer led by the facilitator team and continued to eat together.

5. CONCLUSIONS AND SUGGESTION

The level of public understanding of landslide prone areas in Winong Hamlet, Sumurup Village is very low, as seen from the characteristics of the community of Winong Hamlet, is to follow what they are told. So that independence in the process of change is not embedded in their attitudes, so that whatever happens does not affect the advanced mindset. Because of the low level of understanding and educational factors which on average do not complete elementary school (SD), it is not surprising



that when a disaster strikes, the community prefers to wait for instructions from information rather than initiatives to save themselves. It's like the case when people actually want to have hope to change but powerlessness makes them feel they lack strength. Because there is no assistance from anywhere, even when there are assistants who want to bring the community to change, the community is very enthusiastic about that change.

Community preparedness in dealing with landslides in Winong Hamlet has reflected an enthusiastic attitude in dealing with disasters which is really needed by the people of Winong Hamlet, but the lack of information and availability of facilities in the disaster regarding the disaster has not been felt by the community of Winong Hamlet at all. Because with a calm and safe situation before the disaster, the community and village officials never thought about potential hazards, so disaster preparedness in the community was not implemented in Sumurup Village. Make people only think safe.

The village policy had just opened the beginning of the active standby village program that was only one year old, the village was actively active because it reflected the current disaster, and the formation of active village groups was on standby, but had not run optimally. There is still a lot of needed improvement regarding programs related to natural disasters, both by the village government agencies themselves and the community. The right strategy to create a community ready to reduce the level of disaster risk is a number of strategies that have been carried out including Mitigation Education for Landslide Disaster Mitigation in the Winong Hamlet Community in Disaster Risk Reduction with patterns of field action and practice in understanding to increase and reduce potential hazard risks there could have been a disaster, but the limitations of the community in

understanding and practicing in the field were not yet maximal, but the community was very enthusiastic if one day there was assistance made for development in the improvement and empowerment carried out in Winong Hamlet.

ACKNOWLEDGMENT

The researcher grateful thanks to the well-appointed village government and winong hamlet community who have participated in participatory action research activities in landslide risk reduction in Sumurup Village.

BIBLIOGRAPHY

- Abarquez, I. and Zubaid, M. 2004, *Community Based Disaster Risk Management: Field Practitioners' Handbook*. ADPC, pp. 17
- Afandi, A. 2018. Participatory Action Research (PAR) in the Community Service of UIN Sunan Ampel. *UNIVERSITY-COMMUNITY ENGAGEMENT October 8-10, 2018* 3 (1), pp. 19.
- Grotberg, E.H. 1999. *Tapping Your Inner Strength*. Oakland: New Harbinger Publication.
- Kafle, S. K., & Murshed, Z. 2006. Community-based disaster risk management for local authorities. *Asian Disaster Preparedness Center, Bangkok*, pp. 19-27.
- Lassa, J. 2009. *The Right Tips for Managing Disaster Risk: Community Based Disaster Risk Management (PRBBK)*, Jakarta: PT Gramedia Widiasarana Indonesia.
- Reivich, K. and Shatte, A. 2002. *The Resilience Factor*. New York: Random House,
- Wayan I C. E. S. 2013. *Tests Landslide Disaster Risk Analysis in Sukasadi District, Kab. Buleleng*. Universitas Udayana Denpasar, pp. 27-37