Local Wisdom and Public Participation in Landslide Disasters in Girimulyo Kulon Progo

N. Asriyani and Hastuti
Department Geography Education Post Graduate Education Yogya State University

Email: nisa_asriyani.2017@student.uny.ac.id, hastuti@uny.ac.id.

Abstract. This research is about the local wisdom of Girimulyo community in disaster prevention. The purpose of this research is to obtain data and information about local wisdom based on knowledge, understanding, and the way of local wisdom mitigation of landslide disaster in Girimulyo. This type of research is qualitative. There is 5 households selected as sample by using proporitional sampling technique. For informants, they were selected using porposive sampling where the people living in Girimulyo were selected as informants were questionnaires analyzed using percentages. Outcomes (1) Local wisdom based on their knowledge can predict it then save themselves elsewhere, (2) Communities have a good understanding to determine what they should do (3) Community mitigation activities are done by preparing all the needs that should be brought. Girimulyo people got information about the disaster from BPBD Kulon Progo government.

1. PRELIMINARY
Natural disasters are indeed a very scary thing to feel. Many natural disasters are caused not only because of nature but also human activities. Natural disasters certainly not only can damage facilities, things in our environment and natural disasters can also cause material losses and even cause loss of life. One example of a natural disaster is a landslide.

Based on statistics, in the period of 2005 - 2011 recorded landslides occurred in 809 locations spread throughout the territory of Indonesia and resulted in fatalities reaching 2484 people were killed. For this reason, actions need to be taken to reduce disaster risk. Regarding this matter the government carries out the implementation of Disaster Risk Reduction (DRR) with the legal basis of the Republic of Indonesia Law no. 24 of 2007 concerning 'Disaster Management'. Indonesia is located at the confluence of three world plates namely the Eurasian plate, the Pacific plate, and the Australian plate which are always moving and mashing together. The consequence of the collision is the formation of volcanic pathways in Indonesia. The existence of this volcanic pathway causes in some regions of Indonesia mountains and hills are formed with sloping slopes to steep slopes. This condition causes Indonesia to have the potential of landslides that can cause loss of life, property loss and environmental damage. Landslide disasters are local, but many are spread throughout Indonesia. In the long run, landslides cause more losses than other disasters. The number of landslide incidents has increased in the rainy season, especially in steep hills. Regarding this matter the government carries out the implementation of Disaster Risk Reduction (DRR) with the legal basis of the Republic of Indonesia Law no. 24 of 2007 concerning 'Disaster Management'.

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The area in the northern part of Kulon Progo Regency was formed by the origin of the structural process to produce the appearance of hills on the west side known as Menoreh Hills. Hilly morphological conditions make part of the Kulon Progo area prone to landslides. Landslides are a period of movement of both soil and rocks that descend the slope. One of the triggers of landslides is high rainfall. The high intensity of rainfall due to the formation of Cempaka Cyclones on 28 to 30 November 2017 and then in the south of Java Island, caused the potential for landslide events in Kulon Progo Regency to be even higher. Thus, it is necessary to map areas that have the potential to cause landslides so that the potential losses caused by a disaster can be minimized.

The hilly area is an area that is very susceptible to landslides especially if land use and management do not heed the pre-determined interests and also do not pay attention to the ability of the land. However, the need for shelter is increasing while the land area is fixed, so many residents are building housing around the hills and some even reach the foothills. This is very dangerous for the community itself (Rozi, 2014). The limited ability of the government to deal with landslides that often occur in Girimulyo Subdistrict, especially in Purwosari, encourages local communities to carry out landslide disaster management based on local wisdom. People have become accustomed to this situation. They began to develop knowledge about landslides as local wisdom. The community has knowledge of the signs given by nature before the occurrence of landslides. Local wisdom that exists in the community is a very valuable potential to be utilized in dealing with the problems of natural disasters that always hit this region.

The people in Purwosari believe the signs given by nature before taking action. If the rainfall is high within a few days, the community evacuates to places that are considered safe for evacuation. This region has a sloping settlement pattern which is very vulnerable to being buried by landslides if landslides occur with a larger volume. Based on the phenomenon that occurred and the background of the problem above, the researcher was interested in conducting a study entitled Local Wisdom and Community Participation in Landslide Disasters in Girimulyo.

Local wisdom is often called local wisdom can be understood as a human effort by using his mind to act and behave towards something, objects or events that occur in a particular space. This understanding is arranged etymologically, where wisdom is understood as a person's ability to use his mind in acting or acting as a result of an evaluation of something, an object or event that occurs [1]. Local wisdom is considered very valuable and has its own benefits in people's lives. The system was developed because of the need to live, maintain and sustain life in accordance with the situation, conditions, abilities and values that are lived in the community concerned. In other words, local wisdom then becomes part of their wise way of life to solve all the problems of life they face. Thanks to local wisdom they can carry on their lives, and can even develop sustainably [2]. Social words and society are taken from the Latin language, which is socios which means friend or friend. Society is a group of people who associate with each other in scientific terms are interacting with each other. Another definition is the unity of human life that interacts according to a particular system of customs which is continuous, and is bound by a sense of shared identity. Continuity is a community unit that has four characteristics, namely: 1) interaction between its citizens, 2) customs, 3) time continuity, 4) strong sense of identity that binds all citizens (Koenjaraningrat, 2009 in Putra 2015).

Landslides are one type of soil or rock mass movement, or a mixture of both, down or out of the slope due to disruption of the stability of the soil or rock constituents of the slope. Landslides occur due to stability in the soil or rocks that make up slopes (Ramli, 2010 in Sari 2015). Landslide disaster is an event or series of events caused by the movement of the soil mass from the top of the slope to the bottom of the slope resulting in human casualties, environmental damage, property losses, and psychological impacts [3]. Knowledge gained from curiosity. The stronger the desire to want to
know humans, the more knowledge they have (Djamaris, 2011 in Erisa 2016). Knowledge itself is obtained from human experience of themselves and their environment. The way to get it is through symptoms (phenomena) observed by the senses. Knowledge gained through this experience is different from science.

Local knowledge is a broader concept that refers to knowledge possessed by a group of people who live in a particular area for a long time. In this case, we need to know whether the community is a native or not. Even more important is how a society views in a particular area and how they interact with their environment, not whether they are indigenous or not. This is important in an effort to find out their knowledge to design more appropriate interventions [1].

The understanding of understanding according to Anas 2009 in Fatma 2016 is the ability to use knowledge that has been remembered more or less the same as that which has been taught and in accordance with the purpose of its use. Basically the same understanding is that understanding something means someone can maintain, suspect and interpret.

2. RESEARCH METHODS

This type of research is descriptive qualitative, descriptive research is one type of research that aims to describe systematically, factually, and accurately the facts and characteristics of a particular population. This research is more directed at the disclosure of a problem or condition as it is and reveals the facts that exist, although sometimes given interpretation or analysis (Pabundu, 2005).

The research location is the place where the research was carried out. The purpose of setting the research location is to clearly identify the object of research. In this study the authors determined the location of the study related to the problems that the author took, namely the people in Purwosari, Girimulyo District, Kulon Progo Regency.

[4] States that a sample of some or representative of the population under study, if the subject is less than 100, it is better all so that the research is a population research. However, if the number of subjects is large it can be taken between 10-15% or 20-25% or more. Sampling of respondents in this study was carried out by proportional sampling technique with a sample size of 50% from 139 to 70 people to be sampled.

Research informants are people who are used to provide information about the situation and background conditions of the study. So you must have a lot of experience about the research setting. The technique of determining the informants using proposive sampling with the criteria of the informants that have been predetermined, namely using key informants, key informants are those who know and have various basic information needed in the study. Key informants in this study are: Purwosari residents and community leaders who know best about the form of community wisdom in dealing with this landslide.

Data analysis techniques used in this study are 2, namely:

**Descriptive**

Data analysis used in descriptive research and taken from respondents and analyzed using percentage formula according to Arikunto, 2006 as follows:

**Percentage Formula:**

\[ P = \frac{f}{n} \times 100\% \]

Information:
P = Percentage
f = Frequency
n = Number of respondents

Qualitative
Qualitative analysis does not rely on standard formulas but rather relies on the ability of researchers. There are three elements in the process of qualitative analysis in research, namely:

1. Data reduction
Data reduction is a simplification process from rough data information that arises from written records in the field. Data reduction is a form of sharpening analysis, classifying and organizing data so that final conclusions can be drawn.

2. Presentation of Data
The presentation of information that is arranged allows for conclusion drawing and withdrawal of action. In presenting this data, the researcher grouped and arranged the data according to the order category so that the structure could be understood and gave a conclusion.

3. Conclusion Withdrawal
Withdrawal of conclusions is part of the whole activity. Conclusions are carried out after the research has been carried out.

3. RESULTS AND ANALYSIS
A. Results of Descriptive Research
After doing research in Purwosari, about the knowledge, understanding and form of mitigation, the results are obtained:

1. Knowledge of the community in dealing with landslide disasters as follows: (a) Community knowledge of landslides 44.71%. (b) information on landslides 48.14%. (c) The cause of landslides is 86.14%. (d) Efforts when landslides 81.86%. (e) Signs before landslide 41.86%.

2. Understanding of the Community in the face of landslides as follows: (a) The impact of landslides is 75.14%. (b) Efforts to prevent landslides 44.71%. (c) Community economic activities 92.71%. (d) Activity of landslide occurrence 45.29%. (e) The role of the government in overcoming 59.57% landslides.

3. Forms of Mitigation in the face of landslides as follows: (a) Understanding of mitigation 34.71%. (b) Mitigation Measures 28.14%. (c) Efforts after 100% landslide. (d) Socialization after landslides 74.71%. (e) Experience about mitigation 52.43%.

B. Qualitative Research Results
After doing research in Purwosari, about the knowledge, understanding and form of mitigation, the results are obtained:

1. Knowledge of the community in the face of landslides.
Longor is the same as falling trees and mud from above the slope, due to deforestation. It is prone to landslides here where landslides often occur. There is a thunderous sound, the river water shrinks. Planting trees but not yet adequate.

2. Understanding the community in the face of landslides.
When there are signs of landslides, the community will be instructed to evacuate immediately. The community already has knowledge about landslides which are given by the government and the BNPB. The closest evacuation route is in the village hall which is a flat area. There are no agricultural activities that cause landslides, but because land clearing for plantations is the cause of landslides. The government through BNPB is very helpful in eradicating landslides through simulations and what happens when landslides occur such as avoiding crack areas if there is continuous rain.
3. Form of mitigation in the face of landslides.
Attempts to prevent landslides from happening again. Plant trees where landslides have occurred. Inform the community if there is a program from the government for tree planting, there are funds available from the plantation service for reforestation of landslides. Participate in tree planting. Come see the location of the landslide and observe what impacts the landslide has caused and reported to the government and BPBD.

4. Government and community efforts in disaster mitigation.
The Geospatial Information Agency (BIG) in collaboration with the Regional Disaster Management Agency (BPBD) of Kulon Progo Regency conducts rapid mapping in parts of Girimulyo Subdistrict. The selection of the study area was based on reports from local residents who encountered ground cracks in Purwosari Village, Girimulyo Subdistrict. The BIG Rapid Reaction Team and BPBD of Kulon Progo District carried out aerial photography with UAVs and field surveys to collect data on the actual appearance of the field, fault lines, surface material conditions, and the location of springs and evacuation posts. Besides that, there were found landslides (actual landslides) in several locations. Based on the results of the field survey, the length of the soil cracks in Purwosari Village is ± 150 m. Ground cracks in Purwosari Village have been buried by residents to minimize water infiltration. The local Village Chief said, his party had formed a natural disaster post along with a local Disaster Preparedness Village (KSB) team assisted by volunteers, Disaster Preparedness Cadets (Tagana), Girimulyo Sector Police, and Indonesian National Army (TNI) personnel to work together to condition disasters and collect donations to be given to refugees.

This discussion will discuss the results of research on the wisdom of the community in dealing with landslide disasters in Purwosari, Girimulyo, Kulon Progo regency which includes knowledge, understanding and forms of mitigation.
First, based on research that has been done in the field on community wisdom in dealing with landslides in Purwosari in terms of knowledge as follows: 1) Community knowledge of the understanding of landslides is the fall of trees that are sloping. 2) Knowledge of information about landslide events, namely through own experience. 3) Knowledge of the causes of landslides, namely high rainfall. 4) Knowledge of the efforts made when landslides occur, namely to evacuate a safe place. 5) Knowledge of the signs of landslides, namely the soil has cracked. In this case the results of interviews conducted with the community stated the same thing that landslides were interpreted as falling trees on the slopes accompanied by soil containing water from the top of the slope. They got information about landslides from their own experience, landslides caused by the high rainfall that hit the region. When a landslide occurs they immediately evacuate the designated place and the signs before the landslide they observe as river water changes color, the volume of river water decreases from the usual one, the ground cracks and the roar.

Compared with [5] research in accordance with the "Influence of Disaster Knowledge on Attitude of Citizens Preparedness in Facing Landslide Disasters in Sridadi Village, Sirampog Sub-District, Brebes Regency" disaster in the high category is indicated by the attitude of citizens preparedness in dealing with landslides.

Second, based on research that has been done in the field on community management in terms of understanding as follows: 1) Community understanding of the impacts of landslides, namely loss of livelihoods. 2) Community understanding of prevent landslides, namely not cutting down trees around the slopes. 3) Community understanding of economic activities, namely agriculture. 4) Understanding of the community on the activity that causes landslides, namely the garden. 5) Understanding the community in overcoming landslides, namely responsiveness. The results of the interviews also show that the paths are in more flat villages such as Giripuwo and Pendoworejo depending on the distance
between the houses and the evacuation location. Landslides Clove plantation activities have been caused due to land clearing by logging. Efforts to prevent landslides they are by planting trees in locations that have been damaged by landslides. Compared to [6] study, it was not appropriate because of his research entitled "Understanding the Community of Landslide Vulnerability Vulnerability in Dieng Village, Kejajar Subdistrict, Wonosobo District." and how to overcome landslides in the low category.

Third, based on research that has been done in the field on community wisdom in dealing with landslide disasters in Purwosari in terms of mitigation forms as follows: 1) Forms of community mitigation regarding the understanding of landslides is a series of efforts to stop disasters. 2) Form of community mitigation regarding actions in mitigation, namely before a disaster occurs. 3) Forms of community mitigation in an effort carried out after landslides, namely returning home after the instruction. 4) Forms of community mitigation regarding landslide socialization, namely community leaders. 5) Form of community mitigation on experience in landslide mitigation, which is frequent. The results of the interviews also concluded that they understood mitigation as an effort to prevent the impact of landslides, they carried out mitigation activities by evacuating and preparing everything that was considered very important. The socialization efforts were carried out by the government and BNPB by holding activities that could be attended by the community as well as special visit activities from the local government. They support government activities regarding greening of degraded forests so that this activity is expected to prevent the occurrence of landslides that often hit their territory.

Compared with the study Susanti, et al (2017) accordingly because his research entitled "Analysis of Landslide Vulnerability as a basis for Mitigation in Banjarnegara District" suggested mitigation efforts that can be applied to areas that are categorized as landslide prone are based on community independence through the formation of disaster resilient villages, namely villages responsive and can minimize disaster risk through adaptation or adaptation to the environment that is vulnerable to landslides.

4. CONCLUSION

From the research that has been done can be concluded as follows:
1. Community wisdom in dealing with landslides in terms of knowledge has been very good, they already know that their area is an area prone to landslides so they already know the signs of landslides and evacuation routes to escape from the disaster.
2. Community wisdom in terms of understanding, the community has determined the action if the symptoms of landslides have occurred such as evacuating to the routes that have been determined such as Giripurwo and Pendoworejo villages depending on the closest distance between their settlement and the evacuation site.
3. Community wisdom in landslide disasters is seen from mitigation, namely, the mitigation activities they do by preparing everything that needs to be carried out when landslides occur. The Giripurwo community received socialization of landslide disasters from the local government and from the BPBD of Kulon Progo Regency.

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