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Households Community Preparedness in Dealing with Landslides

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Abstract

The aim of this research were to (1) identify household preparedness in dealing with landslides as seen from the indicator of knowledge and attitude, emergency planning, early warning system resources mobilizing capability, (2) to analyze factors of difference household preparedness. Research was done to the society of Cipanas subdistrict, Cianjur district, West Java. The method used is descriptive. Sampling was done by *purposive sampling* study with the number of 72 households in each sample area. The data analysis used an index analysis to measure the level of household preparedness. The results of early research shows that level of household preparedness in dealing with landslide in Cipanas subdistrict, district of Cianjur, is still in the low category. The values of each parameter are vary, but overall fall into the less prepared category.

Keywords: Preparedness, Landslides

Introduction

Cipanas subdistrict is one area in Cianjur district that prone to landslides. Landslide in subdistrict of Cipanas has occured in about sixteen times in 2011 – 2016. The increasing number of residents in Cipanas subdistrict leads the to changes of land use to be settlement for households. According to the *United Nations Development Program and the Government of Indonesia* (2012, p. 2) preparedness is "a series of activities to anticipate disasters, through the organization as well as through the actions that appropriate and useful." It aims to minimize the losses that may arise after the landslide occurs. According to Bakornas (2006, in Khaira, 2010, p. 33) some household preparedness actions are: "preparing alert bags, bring up electricity tools, studying disaster prone areas map, studying safe locations and routes, studying first aids, placing house keys in a safe place, write down important phone numbers, and put *the phone* in a place that easy to reach. The research problems were (1) How is the condition of knowledge and attitudes of households in Cipanas subdistrict, Cianjur district? (2) How the emergency response plans of households in Cipanas subdistrict, Cianjur district? (3) How is the early warning system of households in Cipanas subdistrict, Cianjur district? (4) How is the ability to mobilize household resources in Cipanas subdistrict, Cianjur district? (5) How is household preparedness in dealing with landslide in Cipanas subdistrict, Cianjur district? (6) How is the level of preparedness of households in dealing with landslide in Cipanas subdistrict, Cianjur district?

One of natural disaster that often occurred in Indonesia is landslides. James (1978) cited by Dumanski (1997) says that landslide is the process by which earth materials (bedrocks, unconsolidated sediments and soils) are transported down slopes by gravity. Just like another disaster, landslides are alo dangerous. Landslides was a movement of rock mass which gliding, shifting (sliding/slipping) and rotating (rotational) due to the force of gravity so that its movement is faster and contained less water (Thornbury, 1969). Besides it will causing physically impact, it certainly will causing nonphysical impact. Areas that has high risk of disasters are expected to receive serious attention. Various efforts need to be done. One of the efforts that is currently a trending topic is disaster mitigation. Natural occurrence, such as earthquakes, landslides, volcanic eruptions, are also very likely. As well as with the occurrence of starvation and poverty

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have also occurred. The problem is that if all these occurrence leads to the destruction of property and human life, it is expected to be anticipated. A good effort, not just after it happened, but the early anticipation mitigation effort are indispensable. Mitigation efforts of landslide can be done through physical and social mitigation (Nursa'ban, 2010). Physical mitigation, in the form of alternative actions that can be done at moderate to high levels of vulnerability. Social mitigation, in the form of prevention and overcoming by suppressing, even eliminating the loss of life and property. Mitigation, in the form of socialization and training and simulation is very important. Mitigation is an action before disaster occurs to reduce to a minimum the loss of property or loss of life (Sutikno, 1994). Mitigation of natural disasters is an action to reduce the impact of disasters and is similar to prevention activities (Sudibyakto, 1985). According to Nugroho (2012) an effective evacuation can be done if there are several things including "alert system that timely and accurate, identification of evacuation routes that clear and safe, policies/regulations that ordered everyone to evacuate when the order was given, and a public education program which contains the public awareness of the evacuation plan." The public education program is in socialization and simulation for the household. Mitigation efforts of landslide can be done through physical and social mitigation (Nursa'ban, 2010). Physical handling is not an appropriate solution, but must be parallel to the social, because the societies is an important element in the handling of disaster.

Method

Research location was in Cipanas subdistrict, Cianjur district. The method used in this research is descriptive, because only presented facts and information of research variables that consists of knowledge and attitude (KA), an emergency response plan (EP), early warning system (WS), resources mobilizing capability (RMC). The research population was divided into two, which are the population of area that covers the whole of Cipanas subdistrict and human population that includes all of households in Cipanas subdistrict. This research samples, each represented by a region which included in the category of landslide threat in low, medium and high levels with total sample of 72 households. The timing of this research was began at September 2016 to January 2017. Data collecting techniques using literature study, observation, documentation study and questionnaire. Analysis data technique was using index analysis with formula and condition of index value of preparedness category as follows.

$$\text{Index} = \frac{\text{Total Riil Score of Parameter}}{\text{Maximum Score of Parameter}} \; x \; 100$$

Table 1. Level of Household Preparedness

No	Index Value	Category
1	80 – 100	Very prepared
2	65 – 79	Prepared
3	55 – 64	Nearly prepared
4	40 – 54	Less prepared
5	0 – 39	Not prepared yet

Source : Sopaheuluwakan (2006)

To calculate the index value of each parameters, using the weight and formula as follows.

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Table 2. Weight of Each Preparedness Parameter

Component	Parameter (%)				Total (%)
	KA	*EP*	*WS*	*RMC*	
Household	30	30	20	20	100

Source : Analysis Results (2016)

$$\text{Index} = \left(\frac{\text{Weight of } KA}{100}\ x\ KA\ index\right) + \left(\frac{\text{Weight of } EP}{100}\ x\ EP\ index\right) + \left(\frac{\text{Weight of } WS}{100}\ x\ WS\ index\right) + \left(\frac{\text{Weight of } RMC}{100}\ x\ RMC\ index\right)$$

Results and Discussion

Cipanas subdistrict area is one of the subdistricts in Cianjur district that located in the northern region under the foot of Mount Gede. Besides, Cipanas subdistrict is directly adjacent to two other districts, which was Bogor district in the west and Sukabumi district in the south. The topographic condition of Cipanas subdistrict which has different altitude causes a diversity of area condition in the form of flat, slope and peak. That area conditions causes differences in levels of landslide threat in Cipanas subdistrict.

In 2015, Cipanas subdistrict has a population of 108.115 inhabitants with population density of 2,689/km^2. The highest numbers of population is located in Cimacan village and the lowest in Ciloto village. The number of school-aged inhabitants in Cipanas subdistrict in 2015 indicates that the majority of inhabitants were elementary school graduates (SD) that reach 57%, followed by junior high school graduates (25%) and the lowest were high school graduates (SMA) that reached 18%. The increasing of population number in Cipanas subdstrict is expected to be a consideration, because if its uncontrollable it will increase the population pressure to the land. The change of land use into built land were caused by the pressure of population that can not be controlled. The population growth will always demand the space needs for the activities. More damaged space will risk the occurrence of landslides.

Knowledge and Attitudes / KA

Knowledge and attitude parameters for low landslide threat area has 55.25% of preparedness index value so that it is counted in the category "Nearly Prepared". While for area of medium and high landslide threat level each of them has 52% and 50,28% of preparedness index value so that counted in "Less Prepared" category. From the calculation of index value, it is seen that there are differences in preparedness categories caused by different levels of education and knowledge of households in Cipanas subdistrict.

Emergency Planning / EP

Parameters of emergency planning for the low level of landslide threat area has 42.45% of preparedness index value so that it belongs to the category "Less Prepared". While for the area of medium and high landslide threat level, each of them has the index of preparedness value of 33.33% and 37.04% which are counted in the category "Not Prepared Yet". The differences of preparedness categories for these parameters are due to attitude factors that affecting households in act to handle the impact of disasters either before or after the landslide occurs.

Early Warning System / WS

Parameter of early warning system for low level of landslide threat area has 28.27% of preparedness index value which belongs to the category "Not Prepared Yet". While for the area of medium and high landslide threat level, each of them has the value of preparedness index of 25.61% and 20.68% which

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belongs to the category "Not Prepared Yet". It is seen that there is no difference in preparedness index categories for all levels of landslide threat of Cipanas subdistrict.

Resources Mobilization Capability / RMC

Parameter of resources mobilization capability for low level of landslide threats area has a value of preparedness index of 32.87% which is counted in "Not Prepared Yet" category. While for the area of medium and high landslide threat level, each of them has preparedness index value of 28.18% and 20.45% which is belongs to the category "Not Prepared Yet".

Household Preparedness Level

Level of household preparedness in the low level of landslide threat area for all combined parameters has an index value of 41,54 which is belongs to the "Less Prepared" category. While for the area of medium and high landslide threat level, each of them has the value of preparedness index of 36,36 and 34,42 which is counted in the category "Not Prepared Yet". For more details see Figure 1 Map of Household Preparedness Level in Cipanas subdistrict, Cianjur district.

Basically, these four parameters indicate the existence of preparedness category differences. This is due to the factors of education, knowledge and attitudes of household members who reside in Cipanas subdistrict. Education alone is not enough, especially if there is no relevances. Training and simulations of disaster should be a complement. Disaster-prepared civilizing are expected to be built, especially in areas with high risk of disasters. Early warning system is a component which came from the local environment in the community. Early warning aims to disseminate disaster information quickly and effectively to be accepted by society. Resources Mobilizing Capability related to disaster management. Soehatman (2010) adds that "the disaster management requires trained and skilled personnel. Therefore, it is need a well-planned coaching and training program on disaster management that includes an understanding of the handling of a disaster" as the provision of skills in dealing with landslides that could occur anytime, without being able to be predicted accurately.

Conclusion

The level of household preparedness in dealing with landslide in Cipanas subdistrict of Cianjur district is still in the low category. It can be seen from the calculation of the index value of each variable, which are (1) knowledge and attitude, (2) emergency planning, (3) early warning system, and (4) resources mobilizing capablity. Some factors were possible to influence differences in household preparedness in dealing with landslides. Knowledge, attitudes and skills of household members will influence the level of preparedness in dealing landslides. Various related parties are expected to do socialization, training and at once simulation of disaster to the household representative members, so they would be on prepared category. Disaster mitigation to households can be done physically and socially.

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