

# Community Disaster Awareness: Lesson Learned from Karo and Banjarnegara

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**Abstract:** Geographical location, archipelagic region, tectonic formation, large population, and tropical climate condition have put Indonesia as the highest disaster risks area of tropical geo-hazards. How Indonesia deals with natural disasters is a crucial issue nowadays not only for the government but also for academia. This paper provides the experiences of community disaster awareness processes from two case studies on volcanic eruptions in Karo, North Sumatera and landslides in Banjarnegara, Central Java. By conducting in-depth interviews and field observations, this study found that the strategies used in managing natural disasters in Indonesia are still reactive. Although most people live and seek life in the midst of high-risk areas of natural disasters, they are not adequately prepared for disasters, no well-established tradition in facing imminent disasters. This is a characteristic of people with a fatalistic view including those who were the victims of natural disasters. The majority of disaster victims are not afraid to return to their original residence that once was a disaster area. This lack of awareness influenced by the perspective of most people in assessing natural disasters. People tend to accept what nature provides and see natural disasters as an inevitable destiny.

## 1 INTRODUCTION

In the last few years, the disaster caused by nature and non-nature has risen, both from the characteristic factor and the level of risk. The raising of environmental decay through nature exploitation has triggered the raising of the potential disaster.

In general, a natural disaster is an inflicted event which resulted from natural earth cycling processes (Bankoff, Freks, & Hilhorst, 2003) such as flood, hurricane, volcano eruption, earthquake, tsunami, and other geological processes. As a consequence of the disaster, there are numbers of death, injuries or misery, property damage, the loss of family income, and psychological impact.

Based on Worldwatch Institute, 905 disasters happened in 2012 across the world, and 93 percent was caused by weather anomalies (Ikhuoria, Yesuf, Enaruvbe, & Ige-Olumide, 2012). It said that flood and hurricane are among the two highest main factors of the disaster in the world. Meanwhile, the flood was the most frequent and has an enormous impact on economic, business, infrastructure, service and health in society as this also happens in Indonesia.

In 2005, UNESCO placed Indonesia in the seventh among high-risk countries in the world. Various disasters happened and caused victims along with numerous losses. Every year, many people died, injured, fled from their home, and many other detriments. Therefore, it is important for Indonesian people to know, understand, and aware that the earth has a high risk of disaster.

Experiences have proven that disaster has directly affected a society. Not only physical damage but also the loss of beloved families. It might cause psychological pressure for citizens and also cause post-traumatic stress disorder (PTSD) (Jia, et al., 2010). It can also cause depression, somatic, and anxiety [ (Chou & al, 2004). In a post-disaster period, people are likely vulnerable and useless toward the traumatic effect of the disaster.

In the sociological perspective, disasters are often known by people and social perspective, based on their emotional experiences on various events that threaten their lives. Disaster is part of the definition that composes a social context of a social and cultural aspect of people who experience a disaster (Pramono, 2016).

One of the strategies to manage natural disaster in Indonesia is still tenuous. Meanwhile, many kinds of literature have proven that factors related to the enhancement of adaptive capacity on disaster should be adopted and implemented as a policy. Therefore, readiness is the most critical factor in the mitigation process. There are various approaches to disaster management; prevention is among one of them. The main principle of disaster management is if we are incapable of preventing disaster, then we have to relieve the number of victims and losses

The government has been doing some programs, such as Desa Tangguh Bencana (Sturdy Village from Disaster) or called *Destana* program. *Destana* aims to give a special preparation and insight on disaster mitigation so that the people could be more prepared on the possibilities of disaster. The real form of this program is by forming villages' acts, planning on village disaster handling, autonomous budget composing for disaster perceptive or village budget. This program hopes, people might understand the disaster management, such as prevention, mitigation, alert planning, early warning, readiness, emergency knowledge, operational planning, emergency perceptive, recovery, rehabilitation, and reconstruction. In the macro level, government, people, and the private sector are expected to strongly beneficial in the implementation of living in harmony with disaster risks.

The government of Indonesia has enacted law No. 24 on disaster management since 2007. Based on this law, the implementation of disaster tackling is (1) readiness; (2) early warning; and (3) disaster mitigation. Regarding disaster mitigation, more often is constrained by people misperception on disaster. Admittedly, it is uneasy to raise people awareness on their way of the importance of disaster readiness.

## 2 THE LANDSLIDE IN BANJARNEGARA

Banjarnegara district is located from 7°12'S–7°31'S latitude and 109°29'E–109°45'E longitude. Spreading on the mountain valley in the middle of west side of Central Java which across from west to east. Banjarnegara is a district that has lies on mountain area with high level of landslide hazard (Prasetyo, 2018). One of the main cause factors of the vulnerability escalation is improper land-use planning. Vulnerability escalation can get intense worse if the government as well as the people do not realize or anticipate any threat of natural disaster

coming in their area. Landslide disaster in Banjarnegara District caused economic collapse, building damages, fatalities and property losses.

In 2014, a landslide struck in Dusun Jemblung, Sampang Village, Karangobar District, Banjarnegara Regency, and Central Jawa Province. Dusun Jemblung is a risky area on landslide with mid-high intensity. Two days before the event, on December 10th-11th, 2014, Dusun Jemblung had rained heavily so, land in the area filled with water. Meanwhile, the material composition of Telaga Lele hill – the location of Dusun Jemblung – was precipitated by old volcanic material which the soil horizon is thick and weathered and the slope of the hill is less than 60 percent.

Meanwhile, most plants on the hill is an annual crop such as palawija which is not so close, and the soil becomes loose and easily carried by water. Allegedly, the cause of landslide is the human itself. Agricultural cultivation which was not considered conservation also become one of the causes of the landslide. In the slope of the location of the incident also has many terraces.

Landslide disaster is not something new for people in Karakobar district. In the district with 13 villages, nearly every year this type of disaster happens, even though on a relatively small scale. Naturally, natural landscape of Karangobar is not appropriate for settlement area. Its hilly landscape and unstable soil texture made this area easily hit by a landslide. Fragile soil also is the characteristic of this area geological. Rocks insert the soil, and when hit by rainfall, plots that cut all bond between soil and rocks will potentially be going slide.

Regarding disaster handling, the role of state and society are needed. The role of the state is represented by BNPB (National Disaster Management Agency) and BPBD (Regional Disaster Management Agencies) which are responsible for taking any action during the calamity. Meanwhile, people participation is required for disaster risk reduction and avoidance. However, it is crucial also to enhance people awareness and capacity for disaster management (Suryanti, Rahayu, & Retnowati, 2010). A study, (Zein, 2010) explained that society is the party that has direct experience of a disaster event. Therefore, understanding of disaster might be beneficial and capital for risk disaster reduction. In the context of natural disaster management, it is essential to know how people respond to natural disaster (Marfai, et al., 2008).

Respond of the people is the beginning adaptation strategy which resulted through the understanding of existing disaster; people's understanding such as

knowledge and perception that has actualized through attitude and action towards a disaster. The result of behaviour and action towards disaster is an adaptive strategy which means an adjustment on the potential threat from the surrounding environment.

Since adaptation and social resilience of society in the disaster area are crucial, there is a need to increase various studies on adaptation strategy in society, both in individual level and group on disaster management. Adaptation is a result of people's attitude which appears based on their knowledge and perception of disaster indication.

Almost 70 to 75 percent of Banjarnegara area is indicated as potential landslide area because of its location on the slope of Dieng highland. 12 out of 20 districts in Banjarnegara Regency, is in the red zone or landslide potential zone since the area is hilly and the soil is easily in motion. The increasing number of a landslide in Banjarnegara should trigger its surrounding neighbourhood on understanding and anticipating any potential harmful disaster by living in harmony with surrounding nature. It became essential since the self-mitigation concept in society is still weak.

People, in general still depend on the government's aid and initiative up to now. As a consequence, victims during the disaster cannot be reduced significantly. Numbers of people in the area, who live in the hill area in Banjarnegara admitted that they did not have any knowledge on disaster mitigation and they depend on the natural indication. Mostly, people who live in the landslide area felt perforce to live in the mountain area because of the high density of the urban area. They usually depend on cultivation and agricultural economics and make them live in the hilly and risky area is a logical consequence of being a peasant.

In general, a village with landslide risk is under a big hill with most of its slope is planted by annual crops such as Potato, Cabbage, and several varieties of horticulture. Therefore, during the rainy season, the soil condition remains unstable and causing a landslide. So far, people often rely on disaster socialization from the government. There are no self-movement initiated by people to raise the attitude towards disaster consciousness. People's behaviour in the surrounding disaster-prone area is not suitable for the rules of conservation. For example, Jemblung village has landslide at the end of 2014, of about 150 families, 75 percent of them have a fish ponds surrounding their houses.

People and Government need to consider some steps; First of all is the identification of Jemblung village characteristic and its surrounding such as the

form of land which is hilly with a medium-steep slope with mostly volcanic rocks, various type of slopes, the type of soil, rainfall, and also the river intensity.

The concept of understanding of anticipating the risk of landslide needs to be acknowledged by the entire community so that the community is expected to be able to overcome the risk in the area. Government both central and regional should focus on raising people's awareness of the life in disaster-prone areas in Banjarnegara and be educated on disaster mitigation properly.

The most appropriate treatment in Jemblung village is the bio-engineering system or planting technique, because of extensive and hilly in the area. Therefore, this might be difficult to apply as protection techniques such as making talus on the slopes. The bio-engineering method is a method for landslides handling by observing the equilibrium of slopes which formed by plants.

As in the Telaga Lele Hill (the location where Jemblung village is) and its surroundings, when setting the plant, people should pay attention to the angle of slope and the position of the slope. Because *palawija* crops can be planted on the lower slopes and the slope is not extremely steep. Therefore, there must be a plant that supports or strengthen the slopes such as calliandra and other strong root plants, although there are not many. For the upward parts, it is still permitted to plant *palawija* crops in the higher slope area, and it needs more support of plants in the slope due to steep slope conditions which have the potential to a landslide.

Furthermore, on very steep slopes, it is only possible for certain reinforcement plants. Hard plants can also be used as water absorbers, reducing the concentration of water in the soil and might naturally prevent landslides. However, the most important thing is the plant might become a buffer plant in the slope area and protecting the soil from landslides. The community should understand that in the location of landslide-prone areas, non-structural activities such as socialization of landslide prevention become an important agenda in landslide handling and must be done immediately. The government should bring all elements of society in this activity, for example by involving universities, NGOs, and mass organizations so that the community can prevent landslides.

Landslide disaster is not new for the people in Karangobar District, Banjarnegara, and Central Java. Almost every year there is always a similar disaster in the sub-district. Almost every year, land slide also costs the lives and the properties of people. The area in Karangobar Sub-district, especially in

Jemblung village, is not possible to be a settlement area. The condition of the hilly topography and unsteady soil texture make this area potentially hit by landslides. In general, the geological condition of this region has fragile soils. The rocky soil and some fields cut the bonds between soil and rock. When the rain arrives, the soil might be susceptible to slide or landslides.

### 3 THE SINABUNG VOLCANO ERUPTION IN KARO

Mount Sinabung, located in Tanah Karo District, North Sumatra Province, is one of 30 volcanoes located above the Great Sumatra Fault. Mount Sinabung began to reactivate after the earthquake and a devastating tsunami that shook Aceh on December 26, 2004, followed by the Nias earthquake in March 2005 and July 2006 then the earthquake in Padang in September 2009 followed by an earthquake in Nias Island in October 2009. A year later, on August 29, 2010, Mount Sinabung erupted for the first time after 400 years of silence (Lestari, 2016). Since then, the Mount experienced a significant increase in activity. On September 15, 2013, the status started from Level II (Cautious), and entered Level III (Alert) from November 3, 2013, until now it has entered the highest level, namely Level IV (Beware).

From December 2013 until January 2014 there have been 365 eruptions that spewed hot clouds on Mount Sinabung. Even though the government lowered the status to Standby in May 2014, Mount Sinabung was still a significant threat to Karo District residents.

The eruption has affected 33,192 people, and 10,322 families have fled to 37 destinations; 17 people died, of which 14 were found at the Sukameriah Village, an area within a 3-kilometer radius from the top of the mountain, while three others who had previously suffered burns died in the hospital. The high intensity of eruption also caused a relocation for some villages within a 5-kilometer radius, considering that these villages could no longer be inhabited. The most severe losses and damage from the eruption are in the infrastructure and agricultural sectors. Although the Karo district government is still implementing the emergency response, the government has begun to take a stand for recovery for people who have been allowed to go home.

Around 28 billion rupiahs have been rolled out by National Disaster Management Agency (BNPB)

through the Regional Disaster Management Agency (BPBD) of Karo Regency which is allocated to immediately address the needs of citizens in recovery processes, ranging from shelters, food, agriculture, and so on. The BPBD has also begun to assist the affected people. These are specifically directed to people in Sukameriah Village, Guru Kinayan Village, Selandi Village, Bekerah Village, Berastepu Village, Kebayaken Village, Simacem Village, Kuta Tonggal Village, Kuta Rayat Village, Gamber Village, Sigarang-Garang Village, Suka Nalu Village, Kuta Gugung Village, Mardinding Village, Kuta Tengah Village, and Perbaji Village.

Siosar Village in Merek District is designated as the relocation site for victims of the eruption. The construction of the house is almost complete, and some people have received the keys and occupied it. The house, with a 100 square meters of land, has also equipped with clean water, electricity and fully furnished. Even though, most people are reluctant to reside in the house because of the land readiness for farming activity as most of them are farmers or peasants.

In the first phase, the government built 370 houses occupied by villagers who were most severely affected by the eruption such as in Bekerah, Suka Meriah, and Simacem Villages. An area of 458 hectares has been prepared to accommodate a total of 2,053 people including the agricultural area, with a budget of Rp59.4 million each. Nevertheless, this program is still experiencing some problems, and it still has a wide gap in meeting the basic need because of the allocation is considered very minimal and has not been able to meet the needs of all affected people.

The government previously had spent 13 billion Rupiahs for agricultural restoration for people in 16 villages in the first phase; this assistance was obtained from the Regional Agency. According to the Regional Office of Agriculture, the funds were spent on the purchase of fast-harvesting crops, such as chili, tomatoes, vegetables, and others. Furthermore, for residents of the nine villages that have just been repatriated, there has been no special allocation for agricultural recovery. The availability of new funds will be allocated for the handling of people in refugee camps, considering that the Karo Regency still states the emergency response situation and some of the treatment is still focusing on this phase.

Until now, all the victims who have been allowed to return to their settlements have not received any assistance for their livelihood recovery from the Karo Regency. In some villages, such as Mardinding Village and Perbaji Village, many residents have been indebted to fulfil their basic needs. Since the

evacuation, their family income is only from their life insurance (especially during the last emergency response period) which has been given by the government in a minimal amount. Head of Perbaji Village, Mr. Martin Ginting, said that many people sold their assets (such as gold) and owed money to fulfil their daily needs such as children's school, food, and other needs.

Some people take the initiative to work on other people agricultural. Unfortunately, it does not need any labour. Some others are renting people's land in around Rp. 6 million per year for 0.5 hectares. However, the land is in dormant condition due to the capital limitation to buy seeds and fertilizer. The government's promise to provide seed is yet to come. Based on the interviews and discussions carried out with the community, the majority of people in the nine villages did not have any ability except farming. Considering that they are doing this inherited profession, it is challenging for them to adapt to other economic activities.

They expected the assistance from the government in the form of seeds with a short harvest period (about 3-4 months) and had a relatively good economic value. The hope is that the assistance is might be improving their economic conditions. The data shows that the refugee's livelihoods are vegetable and horticulture farming. By being a peasant, they can merely survive and continue their post-disaster life.

As explained above, the affected people have suffered and harmed their livelihood in farming for almost one year. In short, the livelihood system of the people in the affected villages was destroyed. It destroys people's economy, and it is difficult for them to be able to meet their basic needs when returning home. Some of them also have indebted to fulfil their basic needs. People also do not have any other skills and their lives depend on agricultural activity. Entering the transition period of recovery, especially for residents in the nine villages that have been allowed to return home, a quick response is needed to restore their economic conditions.

Refugees need short-term programs that generate stimulus income in the relocation area. Providing financial resources through cash for work (CFW) is one of the recommended models for the recovery program. The program can be directed to repair or rebuild public facilities so that the community has an opportunity to continue and rebuild their lives towards a normal situation. A real example that can be done is by involving people in some government recovery projects for they can earn a decent income.

The way of refugee's handling disaster seems to emulate the community-based settlement rehabilitation and reconstruction model. This model was successfully applied to refugees from the Mount Merapi eruption disaster several years ago. Unfortunately, the recovery processes of the Mount Sinabung refugees are slower compared to Merapi refugees. Some factors that make their vulnerable are the unemployment period during a disaster and the dependency of assistance from the government. The local government is often focused only on building temporary relocation housing rather than encouraging the refugees to regain family livelihoods and income. In an interview with Mr. Ginting, a refugee that had occupied the relocation house, he is still complaining about the lack of income and employment. As a horticulture farmer, he preferred to be given by the government a land rather than a house; with the land, he can work and make money. He claimed, he was used to sleeping in the agricultural fields by building simple huts. By farming, he can generate an income, and later he can make a permanent house.

#### 4 LESSON LEARNED

Based on the two disaster cases mentioned above, namely landslides in Banjarnegara and the eruption of Mount Sinabung above, the possibility of natural disasters in both areas should be anticipated in advance. During the last 25 years, more than 20 natural disaster management policies have been made by the government of Indonesia. All of them have the same substance, which is trying to protect the community from the impact of disasters. However, so far, the government has not been proven to be able to move the community to be prepared better for disasters. This can be seen from physical facilities or disaster prevention programs that are very few and still below the minimum standart. Availability of early warning facilities and evacuation routes is considered inadequate. Mitigation infrastructure is generally only available in areas that have just been hit by natural disasters. After that the treatment is often overlooked.

The results of this study are in line with the Kompas survey (2011), which found the fact that half of respondents in tsunami-affected areas in Aceh claimed that there were no proper evacuation facilities in their area. While 20 percent of other respondents in the area claimed they did not know about the existence of evacuation routes in their area. Whereas risk mitigation arising from natural disasters and post-disaster adaptation is crucial to being

understood and carried out by the community. The role of the government in socializing the disaster mitigation is very large and crucial. This program was apparently still not optimal. Still according to the survey, most of the respondents (85 percent) felt that they had never been involved in various disaster management activities. This fact strengthens, the culture of disaster awareness in the country that is full of natural disaster threats is still far from what we expected.

It's good if we learn from Japan. Japan is very well known for its highly effective disaster management (disaster response management), this country is always fast and responsive in victims handling. The response from the Japanese government together with all elements of society is generally very fast in dealing with post-disaster situations, recovering areas affected by disasters, and addressing the health and life problems of survivors (Tanaka, 2005).

Disaster management is a structural and managerial process of managing the resources and responsibility in handling everything related to every aspect of human safety, both in the phase of preparation, response, and recovery of disaster events, with the aim of minimizing the negative impact caused by the disaster. Therefore, by developing an assumption that the earthquake disaster has always been repeated, the government and the Japanese community designed and built earthquake resistant buildings.

In addition, they also maintain a consistent environmental protection movements, such as protection of coastal forests or mangrove forests and early protection of the tsunami waves (by placing breakwater stones on the shore to reduce the impact of the tsunami). Equally important, Japan developed a disaster-early warning system. This system make all parties, starting from the disaster task force unit (disaster alert task force) able to respond the event quickly, as well as people who have the potential to experience the impact of the disaster to immediately prepare themselves to move out to the prepared place. They also set up shelters (protection areas) for affected people or victims and provide routine training to the community as a quick response to natural disasters that might come at any time.

One of the things that can be learned by the government and society from Japan is that they continuously develop a disaster emergency response system more effectively. In the tsunami disaster caused by the 8.5 magnitude earthquake on December 26, 2004 that hit Aceh, for example, there were 200,000 people died. Comparing to the 8.9 magnitude earthquake with tsunami on March 11, 2011 in Japan,

there were only around 7,000 people died. This evidence shows that Japan is prepared better for disasters than Indonesia, because of numbers of experiences. Japan is the most prepared country to face disasters. A variety of methods have been carried out by Japan to reduce the impact of disasters, ranging from raising public awareness from an early age, building adaptive infrastructure that might resist to the earthquakes, and developing an evacuation routes for the safety of citizens.

For the sake of developing a disaster awareness, the community is accustomed to participate in disaster evacuation training. The aim of this training is that when a disaster really happens, the residents will no longer panic, and they will calmly follow the standard procedures that they have trained for many times. Likewise, early warning systems for an earthquake and tsunami disasters work well and the results are quickly distributed to the community. The result of the raising of awareness of disasters among the Japanese citizens are clearly seen by their attitude that emphasizes public safety.

For people who are aware of its high impact and physical and social consequences of this catastrophe will put disaster events as a routine issue in everyday life so that they will not shocked if a disaster occurs because it has been predicted beforehand and the disaster management is already planned properly. For people who have not made disaster management planning a public issue, generally they will look very *nrino* (fatalistic) where there is only a resignation to the God when the disaster comes while hoping for help to come as soon as possible. In the end, the pattern declined in the disaster management regime put the country as the dominant actor in handling any disasters. Countries that follow the fatalist principle will apply the principle of minimalism (just fulfill their obligations) in the making of emergency response efforts. This is completely different with a country that is so serious in preparing for a disaster. In addition, this also reflected a major problem between a country or people with lack of cooperation and an egalitarian country or state that is deliberately prepared and anticipated a disasters and upholds cooperation in dealing with disasters as a commons problem.

## 5 CONCLUSION

The handling of disasters that have been carried out in many countries is still considered impulsive (focusing on post-disaster actions); issues on some prevention or reduction are rarely carried out. Many

governments trapped in charity efforts, it seems helpful when a disaster occurs then over time the recovery problem is charged entirely to the citizen. As a result, the perception and accepting attitude towards the disaster that was perceived by the Banjarnegara community and Mount Sinabung make the disaster problem seem to be recurrent without any effort to minimize the victims.

The growing perception among the victims is that disasters are considered as a form of obstacles from God so they must accept it without doing anything about it. This kind of resignation turns out to be a source of individual strength so that they can forget the disaster without experiencing prolonged stress. Awareness of accepting calamities is also a way for the government to efficiently carry out the disaster management policies without any resistance from the victims.

Almost all the refugees and victims in the two regions understand that they used to live in a disaster-prone area with the medium-high category. That is why there is no resistance during the relocation process. Relocation is considered to be the best choice for survival and continuation of life.

Another fact is that the government, both central and local, and communities are often more focused on logistical assistance (clothing, food, and settlement) which is only a short-term solution. However, at the community or social level, rehabilitation and improvement of community or social institutions such as markets, places of worship, schools, livelihoods, and others are often forgotten. In the future, the Agencies, as well as all parties should focus on improving the community-level institutions that were destroyed and building people awareness in their minds.

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