Resolving Health Communication Problem On Disaster Risk Through Community Relationships

Isma Adila¹, Wayan Weda Asmara Dewi, Dian Tamitiadini

This study focuses on how communication science is applied to Disaster Mitigation based on how Community and Communications synergized to in term of Resolving Health Problem after Disaster. In this study, community media is one form of community empowerment that can be a potential in disaster management, based on community self-reliance. In general, studies on how social science positions in disaster mitigation studies are still lacking in Indonesia. It is inversely proportional to the case...
in Indonesia, as we know Indonesia is located on the cluster active volcano, also on the position of the islands. Besides aiming to fill the related studies gaps, the results of this study can be a pilot project for BNBP Indonesia and Public Health Office in determining the government’s attitude for the next steps in protecting people stay in the hazard region to natural disasters in Indonesia. To achieve research objectives, the research type is Action Research, particularly the type of participatory action research. The result of mapping unit of the affected area will categorize the priority level of the management of the Kelud Slope Area, Pujon-Kediri Area. An action plan for disaster mitigation will be covered in an organically-formed communication tools, whether based on communications technology or local community media. This Resolving Health program refers to the major Framework of SDG’s Disaster Prevention on the Asia Pacific Plate. National BNPB also seeks to implement the Sendai Framework 2015-2030 on Disaster Mitigation in Asia, especially Indonesia which has a High Disaster Risk in Southeast Asian Countries. Given the importance of this program, all disaster-hazard regions of Indonesia should implement community-based disaster risk reduction programs.

**Keywords:** Disaster Mitigation; Health Problem; Reducing Disaster Risk

**INTRODUCTION**

In the discussion of the National Medium Term Development Plan (RPJMN/Rencana Pembangunan Jangka Menengah Nasional) for 2014-2019 disaster management programs become government priorities since Indonesia is a country that prone to disasters. This statement is supported by data from the United Nations International Strategy for Disaster Reduction (UNISDR 2010) showed that Indonesia ranks 12th out of 35 countries with the highest risk of death for hazard threats. Based on data from National Board for Disaster Management (BNPB 2011), Indonesia was ranked first for tsunami and landslide with the highest number of victims worldwide. This disaster can not be separated from the factors of geography, geological, and demographic of Indonesia.

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Kelud Mount is one of active volcanoes in Indonesia. The area includes three regions, namely Kediri, Blitar, and Malang. When Kelud Mount erupted in 2014, the ash was covering the area of Pujon-Kediri. Therefore, these two areas experienced a massive impact from this eruption. Several river lanes cannot be used by local residents because it was covered by cold lava.

According to the Preliminary Research conducted in 2015, it is known that the people affected by Kelud volcano already have communities for Disaster Response. Unfortunately, they only focus on post-disaster rescue and recovery activities. They have no pre-disaster or mitigation education, either by local people or Regional Disaster Management Agency (BPBD/Badan Penanggulangan Bencana Daerah).

![Figure 1 Kelud eruption of 2014](source: BPBD Kabupaten Kediri)

Community-based disaster risk reduction (PRBBK/ Pengurangan Resiko Bencana Berbasis Komunitas) is an effort made by community members in an organized manner, especially before a disaster occurs, using the available resources they have as many as possible. In this study, community-based disaster risk reduction is conducted through health communication approaches. This is due to the dissemination of health-based disaster impacts utilizing information technology as an important part of disaster mitigation in accordance with Kepmenkes. 064 / MENKES / SK / II / 2006 about the delivery of Data / Information and reporting using Health Crisis Response Information System for post disaster. Additionally, given the importance of this program, the entire disaster-hazard regions of Indonesia are expected to use health-communication approach as an effort to implement a community-based disaster risk reduction program.
MATERIAL AND METHOD

Qualitative method was conducted in this study. Denzin and Lincoln cited in Moleong (2007) stated that qualitative research is a study that uses a natural setting with the intent to interpret the phenomenon that occurs by involving various existed methods. The study focus according to Moleong (2004) has two intentions, namely 1) to limit the study, and 2) to meet the criteria of a newly acquired information’s flow in the field. Thus, the study focus will show the needed data that should be collected.

This study aims at identifying the programs that have been done regarding disaster mitigation and its evaluation. Later, it will be explained how the disaster risk reduction based on health and community communication in Pandansari Village in the slopes of Kelud Mount, East Java.

![Figure 2 Maps of the area prone to Kelud eruption in East Java](image)
Source: BPBD Kabupaten Kediri

Besides, researchers will cooperate with disaster prepared community groups. This cooperation aims to build community development programs involving people. By doing so, researcher builds post-disaster health information communication system to embody accountability that includes audience focus (consisting of disaster preparedness group, community, and volunteer), leader commitment (covering the role of regional leader, community leader, public figure, and others), situational awareness (understanding the condition of the area at risk of being affected by the eruption of Mount Kelud in order to know the possibilities of evacuation, regional character, and others), and media partnership (the role of researchers in term of providing alternative socialization media to the community such as disaster response application).

By having the dissemination of information related to the impact of the Kelud eruption on public health through health communication approach, it is expected that the community can
gain an understanding and able to encourage others to conduct disaster mitigation independently.

The magnitude impact of Kelud eruption shows the necessity to collaborate with Disaster Responding Village or Destana (Desa Tanggap Bencana) to provide understanding and knowledge that can be accepted continuously across generation in the local area, which can be spreaded to the surrounding area. Destana itself was formed in 2008 as an real attempt to response Kelud eruption both in 2007 and before 1990. The word of Destana comes from the phrase "Jangkare Kawulo Redi", which essentially means to train the community to be able to live side by side with Kelud. In order to equip people to have an early prevention for disaster, Destana has conducted simulation to all villages around Kelud.

Until now, Destana's early prevention is attempted through a radio communication network owned in 67 Villages around Kelud, including 11 villages in Malang District from about 300 villages at risk of being affected (jatim.bps.go.id). The role of East Java BPBD is providing direction as a moral support to all heads of BPBD for districts/ cities in East Java. Therefore, stakeholders who are in charge in the rural area to be able to optimally train a resilient community to face a disaster so that disaster risk can be reduced to zero accident. In this program, people are trained to have the ability to avoid harm. Having an understanding that their environment is a disaster-risk area, they are expected to prepare a plan to avoid the disaster. This program has goals such as actualizing the disaster risk reduction and preparing people's self-sufficient to deal with disaster situations and post-disaster conditions. The people is nurtured to grow an awareness of the disaster mitigation that is generated through understanding the impact of natural disasters for health in disaster communication model, which means people can face appropriately when the disaster strikes.

To achieve the research objectives, Action Research is conducted. In its application, Kurt Lewin cited by Pickard (2013) who pioneered the use of it proposed the principle of "cyclic step" consisting of identifying problems, action planning, implementation, evaluation, and reflection. The type of Action Research used in this study is participatory action research. Gonsalves et al cited by Iqbal, Basuno, and Budhi (2007) explained that participatory action research is a combination of research and action in a participatory way to improve aspects of people's lives.
The affected location is quite large, which consists of 3 districts, namely Kediri, Blitar and Malang. When Kelud Volcano erupted in 2014, the ash was covering the area of Pujon-Kediri where these two areas that belong to Malang District experienced the massive impact from the eruption. Therefore, this research is conducted in Malang District, and thus, it is expected to help the community in Kelud area to conduct community-based disaster mitigation through proper health communication. To do so, the categorization of informants has been done. This categorization was based on the proximity of informants in accessing the relevant information. First, a group of people who are agents of change including the Village Head and the relevant head of government agencies in Malang District, and the members of the disaster awareness group in Kelud area. Second, supported groups including people who have lived in the Kelud area for 5 years who are members of the aforementioned group. The scheme of stages followed in this study is provided in Table 1.

Table 1. The scheme of this research

![Scheme of stages](image)

**Stage 1**
- Identifying the health problem and people’s need appeared as the impact of disaster in Kelud slope.

**Stage 2**
- Collaborating with Destana, BPBD of Malang Regency, dan local health agency to build community relations for people to tackle the health problem as the impact of eruption in Kelud Slope.

**Stage 3**
- Strengthening Destana and increasing the participation of people by implementing the "sustainable health communication in disaster mitigation plan" model in tackling health problem as the impact of eruption in Kelud Slope.

**Source:** compiled by authors

The data analysis done in this study is epiphani analysis that is defined as "analysis done by collecting and reducing information so that significant information and key element are found" (Nawangsari 2004). Thus, there are several purposes of this analysis, such as 1) to reduce, filter, or crystallize the large data, 2) to strengthen and clarify the understanding of
planning and implementation as well as to find the supporting and inhibiting factors in building the community libraries with community participation.

EXPECTED RESULT AND DISCUSSION

1. The role of BPBD in performing the disaster mitigation of Kelud.

BPBD is a government institution that served as the main actor in conducting disaster mitigation program. They perform different approaches based on the types of activities in each of the disaster risk areas. In the Kelud disaster, BPBD has a Destana program (Desa Tanggap Bencana or Disaster Responding Village). This program is implemented in Pandansari village in 2014 after the eruption of Mount Kelud which was inaugurated in 2015.

![Map of Destana Working Area based on disaster risk](image)

**Figure 3** Map of Destana Working Area based on disaster risk

Source: BPBD Kabupaten Kediri

Pandansari village is the largest and most risky affected village among others such as Banturejo Village, Sidodadi Village, and Kasembon. Pandansari Village itself has a Village Information System (SID) that collects all data about the population of Pandansari Village and other needs in digital form related to disaster. Therefore, SID is very important and necessary in tackling the disaster. SID has several functions since in every disaster, data preparedness is necessary, such as: 1) accelerate the making of letters / documents 2) assisting data collection during disaster evacuation such as the number of elderly, pregnant women, livestock, and
others. 3) digital data can be accessed anywhere, as well as serving as a duplicate of physical documents. Data available in SID is updated monthly through data collected by the head of a number of people who live in the same neighborhood (RT/Rukun Tetangga).

The activity in this village was initiated by Mr. Suparno, as a local community leader with the help of local community. Currently, there are 65 members consisting of 30 volunteers and 35 members of the Protection of Society (LINMAS). Besides, Destana initiated activities based on the situation, such as providing emergency corner in the village office when there is an emergency situation due to rainy season. These are the types of catastrophic impacts that should be considered (Table 2).

**Table 2.** The types of catastrophic impacts

<table>
<thead>
<tr>
<th>No.</th>
<th>Form of disaster</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Volcanic Gas</td>
<td>Gases released during volcanic eruptions, such as carbon monoxide (CO), Carbondioxide (Co2), Hydrogen Sulfide (H2S), sulfur dioxide (SO2) and nitrogen (NO2), which harm people.</td>
</tr>
<tr>
<td>2.</td>
<td>Lava</td>
<td>A high-temperature magma fluid that flows to the surface through the volcano's crater. Dilute Lava is able to flow away from the source following the existing river or valley, whereas thick lava flows not far from the source.</td>
</tr>
<tr>
<td>3.</td>
<td>Volcanic mudflow</td>
<td>The eruption of volcanic mudflow occurs when a volcano that has a crater lake erupts so that the hot lake water mixed with eruption material of Kelud in 2014. On the other hand, rain lava occurs due to mixing eruption material with rain water around the top.</td>
</tr>
<tr>
<td>4.</td>
<td>Ash volcano eruption</td>
<td>The impact of eruption ash caused the breathing problems, vision difficulties, water source pollution, electrical storms, disrupt the work of machines and motor vehicles, damages of the roof, fields, organs of the body.</td>
</tr>
</tbody>
</table>
5. Hot clouds

Hot clouds can cause burns to the body’s open areas such as head, arms, neck or legs and also cause out of breath until not breathing.

Source: compiled by authors

Kelud Disaster Management by BPBD and the involved communities are considered as successful by Japan in educating its citizens before the eruption occurs. The education has been started by Destana (Desa Tanggap Bencana) in 2008. It essentially aims to grow people’s awareness that they live in the disaster-prone areas and they have the capacity to do relevant prevention. Besides, they should independently do the action since BPBD office is relatively far and people there should understand better the characteristics of the region. Generally, people were aware of their condition and have the ability and independence to do self-evacuation when disaster occurs. By doing so, people have finally realized its importance such that when the disaster occurred they can implement it in order to prevent victims.

2. The types of activities by Health Agency of Government as the attempt of disaster mitigation.

Related to health problems, there are two village midwives assigned in Pandansari Village. Based on the results of in-depth interviews conducted with Dwi Ratna as an active disaster preparedness team in Ngantang sub-district, disaster mitigation activities from the health sector have been done in collaboration with BPBD, Destana, PMI, KSR also supported by participation from village apparatus. So far, the form of the activity is still a simulated disaster preparedness routinely implemented at least once a year. This simulation is routinely done since the eruption of Mount Kelud occurred in 1991.

On the other hand, the health office is usually seen from vulnerable groups first either the elderly or babies. Potential health problems during Kelud disaster are because the volcanic ash that can harm humans and animals (e.g animal digestion, such as the volcanic ash in between the grass can damage the stomach of animals if they consume it). As for humans, it can disturb their breathing, especially in vulnerable groups such as the elderly. When Kelud erupted last time, many elderly were difficult to be evacuated and chose to return to their homes on foot. It happens since they belief that the eruption of Kelud will not reach
Pandansari Village. Cases like this tend to occur in the areas prone to volcanic eruptions. Due to the closeness of the community to their living environment, many of them are difficult to be evacuated. The Health Office itself is still having difficulties to approach the community groups to participate in the evacuation process. Eventhough their environmental conditions shows the high risk for respiratory health and environmental health. Therefore, those people have already understand what to do when disasters occurs, for example, they can hide under the table even if their house collapses, but not the afterward. After the catastrophic eruption occurs, it is usually followed by other disease outbreaks such as respiratory tract infections and acrobatic diarrhea from unhealthy environment and surrounding resources (for example, the feasibility of clean water and plants for consumption).

Health communication activities conducted by health office are more likely to be done during pre-disaster (for example, through integrated simulations with other agencies) and during disasters. Health communication during disasters is done in aid posts. The Health Office through smaller health offices (puskesmas) usually conduct counseling session collaborated with Destana. These attractive health communication activities were initiated by Destana community, not the Health Office. Unlike the regular action that use LCD (Liquid Crystal Display) monitor or media to explain disaster mitigation steps, but this one is still relatively rare, because most steps have been explained during the simulations. Those activities were conducted by the "Promkes" division or health promotion in collaboration with Destana, as Destana is the main driver of disaster mitigation in the Pandansari region.

Technically, the obstacles possessed by the health office are supporting facilities that have not owned yet by the local health center, such as tents and drug limitations. While in terms of socialization of health impacts, the health department team acknowledged the constraints of information absorption by local people. According to the researchers, this can be anticipated by the existence of a consistent form of health communication such as the information submitted through communication media in the form of banners and leaflets that can be obtained at the nearest health center (Polindes). Additionally, based on the descriptions of interview results, communication activities have inclination to be conducted only to directly experienced the impact of natural disasters, such as information in health education related to respiratory health. In fact, health communication messages delivered not only in the context of breathing but also related to environmental health. Health communication was rarely
disseminated the information related to environmental health. Previously, the environmental health team directly conducts environmental health tests (for example, on clean water, crops, and livestock) to be communicated to the public whether it is edible or not. However, this is not communicated evenly, so that it impacted on the high status of outbreaks of Diarrhea in the community that exist in aid posts. Researchers think that it would be better if basic information related to environmental health communication is also communicated to the community intensively so that the community can independently classify how the most basic environmental health criteria. For example, the information about how to identify clean water and proper consumption, how to cook or process food in the neighborhood post, and others.

Table 3. the form of communication

<table>
<thead>
<tr>
<th>No</th>
<th>Form</th>
<th>Aims</th>
<th>Targets</th>
<th>Action time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Banner</td>
<td>Explaining that the impact of natural disasters can harm health conditions as an important issue</td>
<td>Communities who seek for treatment at village health centers</td>
<td>Consistently, pre-disaster</td>
</tr>
<tr>
<td>2.</td>
<td>leaflet</td>
<td>Communities can bring personalized information media to their homes to be shared with other family members.</td>
<td>People who seek for treatment at village health centers and family members at home</td>
<td>Pre-disaster</td>
</tr>
<tr>
<td>3.</td>
<td>Counseling</td>
<td>It can reach the community groups that</td>
<td>Group of PKK</td>
<td>Pre-disaster</td>
</tr>
</tbody>
</table>
play an important role in
the social system
4. Routine simulation
   Performed once in a year.
   Increasing community awareness by knowing
   the location of the evacuation route.

5. Briefing on environmental health
   Socializing the criteria of a healthy environment condition and
   differentiate decent resources for consumption to the community

6. Communication in the form of verbal announcement
   Delivering the information regarding the location of aid posts

7. Establishment of working groups of citizens / communities
   Strengthening community groups for site rehabilitation

Source: compiled by authors

As a health service center for communities located in hazard-prone areas, Puskesmas and other health institutions should promote health communication promotion related to the impacts of disaster risk around them through the internal communication media that can be
obtained when the community visits to have health check-ups at the Puskesmas or Other institutions despite the occurrence of symptoms of natural disasters. So that the information they get can be vigilant and aware of the importance of their health individually. Realizing its importance, they are able to persuade other communities to participate in evacuation if a natural disaster strikes.

In the perspective of health communication, communicators are assumed to build the perceptions of communicator (community) about new ideas to change behavior that aims to increase the value of health understanding by selecting information and presenting it both gradually and continuously in order to become a priority of information understood by Community. Activities undertaken by Health Office through Puskesmas and Polindes were currently still prioritizing nationally prioritized health issues. In fact, especially for areas with high disaster risk, health communication issues are not only related to major issues nationally but also on the immediate priority issue of how to respond to disaster risks that impact on public health. By showing how to perform the health responses for pre- and post-disaster through the internal media of Puskesmas and Polindes while they are waiting to obtain health services, communicators can take advantage of these conditions in order to build a perception on society that the idea is very important to them. People who are examining their health, can be well educated without having to go through a more specific counseling. Their understanding of the information they can convey to others who are around them. This is in accordance with the characteristics of local communities whose collectivities are high. Health information disclosure will be more effective and the purpose of health communication in disaster mitigation can be more optimal thanks to the role of the community, whether already incorporated in the disaster preparedness community, or who are not incorporated therein.
The creation of independent community in disaster management is part of the Sustainable Development Objective Concept that was born at the UN Sustainable Development Conference, Rio + 20, by 2012 by setting a set of targets that can be applied universally and measurable in balancing three dimensions of sustainable development; (1) environment, (2) social, and (3) economy. Through health communication approach, two main aspects of
sustainable developing goals that can be found are environmental health aspect and development of social system of self-reliance of disaster response.

This research supports the ideas presented in the Sendai Framework as a global reference in disaster management. The framework explains that each country has the primary responsibility for preventing and reducing disaster risks, through international, regional, subregional, cross-border and bilateral cooperation. Disaster risk reduction is a common problem for all countries and the extent to which developing countries can effectively improve and implement disaster risk reduction policies and context-related measures in their respective countries and further enhance their capacity through sustainable international cooperation. Managing disaster risks aims to protect people and their property, health, livelihoods and production assets, as well as cultural and environmental assets as well as promote and protect all human rights, including the right to build, for which community engagement and partnership is required. It also requires empowerment and inclusive, accessible and non-discriminatory participation, paying special attention to people affected by disasters disproportionately, especially the poorest.

CONCLUSION

In the case of Mount Kelud eruption disaster alert, the community has an active role in disaster mitigation activities. Activities undertaken by Destana community is supported by the government through BPBD and Health Office. However, there are many obstacles in the process of delivering messages related to health issues as the impact of these natural disasters. The health approach should be one of the main ideas in supporting effective disaster mitigation programs to the community, especially in Pandansari Village which has the highest risk of impact.

Based on the data obtained, disaster mitigation activities through health communication approaches can be done individually or in groups, with health messages covering disaster response activities in three conditions: pre-disaster, during disaster, and post-disaster. Public health messages submitted to Puskesmas and Polindes through internal communication media consist of how the impact of Mount Kelud eruption disaster for health and how communication related to environmental health post disaster. Such information or ideas can be accessed by the wider community when they visit a local health service center. Thus, the
message is disseminated to the family members of the community so that the community acts as an individual or personal actor.

In contrast to activities that have previously been routinely performed by community-based Destana, people whose level of understanding and information is high enough, Destana-based disaster mitigation activities are very effective because Destana approaches community to community (community groups are gathered to receive counseling and simulation). While the personal health communication approach supported by health office participation can help to reduce difficulties especially in conducting dissemination of disaster mitigation to the elderly or community groups that are difficult / do not want to be evacuated.

As a conclusion, this research provide an approach solution in disaster risk reduction efforts based on Sendai’s framework regarding the criteria of society: 1. Understanding disaster risks; 2. Strengthen disaster risk management and disaster risk management; 3. Investment in disaster risk reduction for toughness; 4. Increase disaster preparedness for effective response, and to "rebuild in a better condition" as a recovery, rehabilitation and reconstruction. It can be formulated through the following model.
Figure 5 Health Communication Based-Disaster Mitigation Plan

Source: compiled by authors

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