

# 35. Communication Model - SUSTAIN

*by* Puji Lestari

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# CONFERENCE PROCEEDING

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THE 5<sup>TH</sup> INTERNATIONAL CONFERENCE ON  
SUSTAINABLE FUTURE  
FOR HUMAN SECURITY  
SUSTAIN 2014



Co-Host



Kyoto University



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PPI Kyoto

The 5th Sustainable Future for Human Security (Sustain 2014)

## Editorial

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Ery Wijaya, Miguel Esteban, Yulianto Prihatmaji.

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The 5th Sustainable Future for Human Security (Sustain 2014) was held in Bali, Indonesia on 19-21 October, 2014. The conference was organized by the Sustain Society, with the support of some  
19 institutions as follows:

1. Kyoto University:
  - Research Institute for Sustainable Humanosphere (RISH),
  - Inter-Graduate School Program for Sustainable Development and Survivable Societies (GSS)
2. Universitas Gadjah Mada
3. University of Jember
4. Hassanudin University
5. Indonesia Islamic University
6. Sahitya Institute for Research.

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The conference covered a wide range of issues with the aim of highlighting potential issues and paths towards a sustainable future. It attracted a high level of attendance from countries of the global North and South, with a wide geographical coverage. Since 2010, Sustain conference have accepted in more than 10 1200 papers from 30 countries, the overall accepted ratio is less than 50% or 37% to be exact. The quality of papers received was a testament to the reputation that the conference has been building over the past five years.

Papers presented at SUSTAIN 2014 were divided into six thematic areas: (1) Energy and Environment (EnE); (2) Built Environment (BE); (3) Sustainable Agriculture (SA); (4) Sustainable Tropical Forest (STF); (5) Disaster Management (DM); (6) Social and Politics (SP). Under these broad areas, a wide-ranging series of presentations was given, which elaborated on current research across Asia and the world. Being held in Bali, Indonesia's "Island of the Gods", the participants also took part in a tour of some of the main sights and experiences that link modern and ancient Bali.

The two programmed days of the conference each commenced with keynote presentations which, like the conference itself, were wide-ranging. The keynote speakers were: Prof. Kaoru Takara (Kyoto University), Prof. Dwikorita Karnawati (Universitas Gadjah Mada), Prof. Naoshi Kondo (Kyoto University), and Prof. Mamoru Yamamoto (Kyoto University).

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More than 170 participants attended the conference from 12 countries in Asia, Australia, North America and Europe. Around 161 papers were presented in the two days of the conference. Papers of the Sustain are published in three publications, namely: proceeding Conference, the Procedia Environmental Science, and a special issue of the International Journal for Sustainable Futures for Human Security (J-SUSTAIN).



The organizers appreciate the support and assistance of the cooperating organizations, the participants, presenters and staff. The next SUSTAIN conference is highly anticipated by all the attendees of SUSTAIN 2014, and the committee expect to build further on the success of this year's event.

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**The 5th International Conference on Sustainable Future  
for Human Security  
SUSTAIN 2014**

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## Communication Model for Disaster Risk Reduction with SMS Gateway and SOP for Early Warning Communications of Mount Sinabung in Indonesia

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### Abstract

The study aims to develop a disaster communications as an early warning system danger of Mount Sinabung in Karo Regency, North Sumatra. The research implemented method is descriptive qualitative research by using focus group discussion (FGD), interviews, trials and application of the model. Communication models applied for disaster mitigation are in the form of an early warning system using Information and Communication Technology with SMS gateways, as well as Group Communication Strategy (Government, community, volunteer) to arrange SOP of Sinabung Disaster Communications Management to be a useful guideline for Karo local government to prevent unpredicted Mount Sinabung disaster. The results of the research are understanding between researchers with Karo local government specifically with BPBD's Karo in (1) the importance of early warning system using SMS Gateway in the case of Mount Sinabung; (2) the requirement of hazard map of Mount Sinabung. (3) the necessity of the SMS Gateway to support Mount Sinabung early warning systems, (4) the establishment of early warning system community based on government and society under the control of BPBD's Karo district, and (5) the draft of SOP for early warning communications of Mount Sinabung. This study recommends the implementation of a disaster communication model via SMS gateway for government and community-based to mitigate disaster of Mount Sinabung.

*Keywords* : Disaster communication management, Gateway SMS device, SOP, Sinabung,

### 30 1. Introduction

Mount Sinabung is located in Karo District, North Sumatra Province, Indonesia. This mountain is not active from "Carbon Dating", an activity known for heat clouds occurred 1200 years ago

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(Solihin Agus, 2014). The Volcano erupted on August 27, 2010 and it continued from 2013 to 2014.



Fig. 1 The eruption of Mount Sinabung in 2010 and 2013 (Solihin Agus,2014:3.8).

Based on geochemical measurements from 1 September 2013 until 14 April 2014, the mountain is still potentially dangerous (observation until April 2014). Intensive monitoring is still underway, as well as the outreach to community about the threat of Mount Sinabung eruption activity continues intensively. Mount Sinabung activity status is still ALERT (level III), starting from 8 April 2014 at 17:00 pm (ESDM, 16 April 2014).

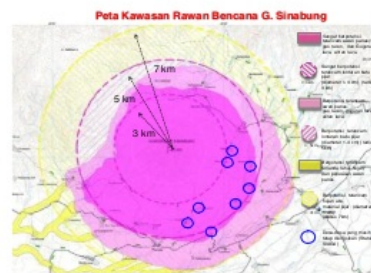


Fig 2: Map of Sinabung in disaster prone areas (Solihin Agus,2014:28).

Various disaster issues in Indonesia have raised national awareness regarding the importance of disaster risk reduction. Disasters likely happen, therefore it is best to prepare to manage these unavoidable events (Hokao, Daunghima, 2013). The issue of disaster management is one of the nine national development priorities in 2010-2014, which aims to build a strong Indonesian community dealing with disaster. In this regard, studies on disaster communication are indispensable to establish disaster resilient communities through disaster mitigation. Communication in disaster period is very important to anticipate destructive effect, therefore, this is a mandatory skill for responsible agency. Strengthening community management of natural disaster mitigation is necessary, such as disaster information management, evacuation, an evacuation process, a common kitchen, managing aid for refugees, and others.

At the time of Mount Sinabung eruption in 2010, the disaster management during the emergency response communications was not well-coordinated due to the absence of SOP (Standard Operating Procedure) of Disaster Management Communication used to guide the implementation of the emergency response, limited usage of interactive media (internet) which specifically informs the disaster, and absence of the Regional disaster Management Agency (BPBD) (Lestari, et al, 2013).

In connection with the above findings, this study aims to develop a model of disaster communication through websites and sms gateway for disaster mitigation in BPBD Karo district of North Sumatra. This research is helpful for people who are threatened by disaster in Karo, Local Government as well as Karo district of North Sumatra province in achieving national development priorities with the urgency to establish disaster resilient communities. Stipulated by the Law of the Republic of Indonesia Number 24 Year 2007 on Disaster Management, the victims of disasters need to be rescued immediately, starting from pre-disaster, emergency response, reconstruction and rehabilitation. An effective disaster communication will be able to reduce the risk of disaster. This was disclosed by Dody Ruswandi, Preparedness Deputy of BNPB, quoted from (Kompas, Wednesday, 04/06/2014, page 13) who argues that research in disaster management is actually one of the fundamental basis of disaster management, as stipulated in Article 3 of Law No. 24 of 2007. Besides, the reality of the lack of research on the background of the disaster is shared by BNPB Kemdikbud Kemristek and the implementation of scientific research meeting 2014 which is expected every year can result in a national blueprint for disaster research.

In order to overcome the problem of lack of research on disasters, Lili Kurniawan, Director of Disaster Risk Reduction, BNPB, quoted from (Kompas, Wednesday, 04/06/2014, page 13) who argues that BNPB currently has been working with 12 universities in Indonesia in developing disaster research with a different focus by reflecting potential disaster area, for example UPN "Veteran" to discuss volcanoes outside of Yogyakarta. UPN "Veteran" Yogyakarta becomes one of the universities that believes to conduct a study of volcanoes in Indonesia, because the performance of Disaster Management Study Center (PSMB) has contributed significantly to the studies about disaster management, particularly volcano.

## 2. Literature Review

Disaster communication model has been developed in Yogyakarta (such as Jalin Merapi). Jalin Merapi Media Center Coordinator, Nasir Ahmad (interviewed in 2011) states that the agency information systems are built to utilize the variety of communication tools, such as: wind chimes radio walkie-talkies, mobile phones, websites, to social media. Nasir says that the number of communication tools for those involved in our system are too many. All means of communication are linked in a managed system. The information system can work because Jalin Merapi has prepared previously. So, during the emergency response period, all parties work without having to think again. Moreover, the information system also seeks to serve all stakeholders, including disaster victims.

Disaster communication is the management of messages production process or information about disaster, spreading and receiving messages from the stage pre-disaster, disaster and post-disaster. As noted by Breakwell (Rod, et al, 2012: 4), the principal rationale for risk communication before, during and after natural hazards is to initiate and direct the protective action. Studies on disaster communication have been done by several researchers, Puji Lestari, (2007); Badri, Muhammad (2008); Nugroho (2008); Puji Lestari, Susilastuti, Retno Hendariningrum (2009); Ramli (2010), Junaedi, Dawn (2011), Noviani Ratna (2012), and Hidayat (2012), Puji Lestari, Agung Prabowo and Arif Authority (2012). According to the results of the Sustainable Management of Earthquake Disaster Communication in the Gantiwarno district, disaster communication management is the process of planning, organizing, implementing, and evaluating the government policies related to the earthquakes management in the area in 2006 and it was found that earthquake disaster management communication in Gantiwarno was not good enough in which it lacked of planning, organizing, implementation and evaluation. It caused many victims

who died, had pain, stress, and a lot of victims were neglected. Thus, the conflict among the community and even with government officials occurred.

Related to disaster management according to Nugroho (2008: 2), efforts to investigate the disaster-prone areas require cooperation and coordination among various government institutions. With the absence of coordination (communication), there will be reactive impact instead of solutive endeavor of disaster mitigation. Badri (2008) examines the communication management in Bantul earthquake DI. Yogyakarta. Communication plays an important role in disaster management, especially to synergize government policies and programs, non-governmental agencies involved in disaster management.

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Some of these studies confirm that the disaster communication is an important activity and should be planned to anticipate the disaster. Things that should be done in an effort of Preparedness or disaster preparedness and volcano mitigation according to one of the researchers who was the chairman of Centre for Disaster Studies UPN "Veteran" Yogyakarta ([http://www.psbupn.org/consul/kesiapsiagaan-and-mitigation\\_bencana-mountain-api.html](http://www.psbupn.org/consul/kesiapsiagaan-and-mitigation_bencana-mountain-api.html)) are: (1) a disaster resilient community should know the characteristics of the disaster-prone areas threat; (2) disaster risks are analyzed by performing threat analysis, vulnerability analysis, and analysis capabilities; (3) a communication network in public radio HT, Hp, internet networks should be established to access information from both government and the community to update the condition of the volcano; (4) the existence of regional action plans (RAD) or a contingency plan at the provincial government level, district to village action plan (RAK) at the community level, which are the activities in disaster risk reduction (DRR), such as training on disaster, building early warning means, building communication networks and so on; (5) the existence of any party cooperation, especially people who are in disaster-prone areas around the volcano; (6) focusing activities to reduce risk before the volcanic eruption; (7) disaster mitigation efforts made in the community to reduce vulnerabilities and increase the communities ability to reduce disaster risk, e.g. disaster training, emergency response training (PPGD) etc.. The theme of this research is a continuation research by the author since 2006 and has been published by Journal of Science Communication accredited (Lestari, 2007), namely the earthquake in communication management in Gantiwarno. Furthermore, the authors also conducted research on conflict management communication in quake-affected areas (Central Java and Yogyakarta) and has been published in the Journal of ISKI (Lestari, Susilastuti, and Retno Hendariningrum, 2009).

According to the research results by Lestari, et al (2013), disaster communication of Merapi 2010 used social networking media, such as facebook, twitter, and HT, HP beside the mass media of television, radio and newspapers as well as magazines. The media is very effective in reducing disaster risk of Mount Merapi in DI. Yogyakarta. Communication and interpersonal group were also performed at the time of emergency response, including through the Forum for Disaster Risk Reduction (FPRB) and many communities were formed at that time. Researchers also examine the models of disaster management communication with students of UPNV Yogyakarta (Lestari, et al 2013). Disaster communication model is very topdown, less involving elements of mass communication and Internet media. Its communication command, which directly uses HT and HP media, is still limited as well (sometimes no signal).

Based on these findings, researchers are interested to contribute ideas to develop a model of disaster communication in Karo district of North Sumatra. Communication model is assessed using appropriate technology (TTG) which is a website and SMS gateway Communication SOP d ter. The model of community-based disaster communication is believed to reduce the risk of Mount Sinabung catastrophe in the Karo district of North Sumatra.

### 3. Research Methods

<sup>35</sup> This study used a qualitative approach and the previous research on the development of Sinabung disaster communication model in Karo district of North Sumatra, erupted in 2010. Researchers developed a communication model for a community-based disaster mitigation of Mount Sinabung. Primary data were collected from interviews with the head of the National Agency for Disaster Management (BNPB). This research partner was the Head of the Regional Disaster Management Agency (BPBD) in Tanah Karo in order to obtain information on the relevant disaster communication model. The data sources given and resource disaster management were mostly done in SKPDs. They also have potential to manage Karo local government websites. The development of communication model through websites and sms gateway can be implemented by the expected human resources in the department,. Subsequently, Focus Group Discussion (FGD) with the following research subjects were attended by several related stakeholders: (1) Head of BPBDs, (2) Head of Social Services, (3) Head of Kesbanglinmas, (4) Chief of Medical Officer, (5) Dept. of Education, (6) District Commanders, (7) BVMBG / Sinabung Postal observation, (8) police chief, (9) representatives of NGOs, (10) representatives of people from the church and mosque (11) representative of volunteers, (12) representative of disaster victims (sub-district). The collected data through focus group discussions resulted in several important statements: (1) experience was once undertaken by the participants in the following programs of Sinabung disaster management in 2013, (2) constraints were experienced during the disaster management, (3) response of the Sinabung disaster management in 2013, (4) the model of communication for disaster mitigation Sinabung cana Sinabung, (5) SMS Gateway Program and SOP Disaster communication. The data were analyzed with descriptive-qualitative techniques. First, the data set was presented in a data display, then those which were not relevant to subject matter were reduced and categorized. The next stage was making the interpretation and conclusion of the study. The conclusions were drawn from the obtained results by the communication model overview for Sinabung disaster mitigation.

### 4. Results And Discussion

#### 4.1. Building SMS Gateway for Sinabung

SMS Gateway was tested in Sinabung, and a few things were prepared. Building the information media must be begun by mapping the users who are the target groups, such as media. In the context of disaster management of Sinabung Volcano eruption, mostly could not be mapped since there are community groups and government who are interested in the information about the volcano. It needs to analyze the required information by both groups and the expected role performed by the groups.

Table 1 Target Group Design and Sinabung Management SMS Information

Source of Information	Sinabung PPGA	PPGA Sinabung
Target Groups (users)	Government (District Government Karo Karo BPBDs)	Society (Leaders / Community Leaders in KRB Sinabung, local community media)
Category Information	Information of Sinabung Volcano status	Information and knowledge about Sinabung Volcano

Nature of Information	Closed / limited	Open / public
Frequency Information	Emergency	Periodic

There are two audiences/key target groups, namely the government and society. Government, as an SMS recipient, is expected to make the decision-making process policies which are appropriately and accurately based on SMS early warning information. Meanwhile, the public is expected to take a decision for the security and safety of themselves, their families, and the environment based on the SMS information. Both groups get information from PPGA Sinabung as a media center or SMS gateway administrator for Early Warning of Sinabung eruption. Categories and the nature of the information for these two groups are different. Government gets detailed and essential information, which are necessary for regional policy decisions, e.g. to decide the evacuation orders. Meanwhile, SMS information to community groups focused more on information about the volcano and it is useful knowledge for disaster education in the family and community environment. Therefore, information via SMS gateway will not shut the role of government down to carry out the duties to provide information in an emergency situation decision directly to the public. SMS information about the status of the mountain (emergency) can be submitted directly to the public with the local government consent.

The system is built in two parts, namely the technical application (technology) and the program management. Frankly speaking, the system are constructed through several stages, including:

- Dissemination process of ideas and concepts to the system maintained by stakeholders and citizens.
- The collection and management of mobile number in the system (input number, categorization a user group)
- Media Management Center as a source of information (PPGA Sinabung)
- Socialization and training to use the system to the user
- Preparation of SOP in the use and management of information systems

This system has been built by a team of Information Technology COMBINE Resource Institution (London) with UPN "Veteran" Yogyakarta online at <http://sms.combine.or.id/sinabung> address. Operating system and application server SMS enabled in COMBINE are connected to the Internet with a public IP. Sinabung SMS Gateway Services is published by a number 0823-1315-9900. The parties in Karo would be trained to use this system after the dissemination of ideas and concepts carried out in March 2014. The process would be a pilot phase system in using a beta version which results are used as a reference of refinement system functions as needed in the field. It is targeted in the end of 2014 that SMS gateway service application to support early warning systems and disaster prevention of Sinabung Volcano eruption could be fully implemented.

#### 4.2. Standard Operation Procedure (Sop) of Early Warning System For Sinabung Volcano

Standard Operation Procedure (SOP) is a standardized set of written instructions regarding the administration of the various activities within organization or institution (government) about how, when, where and by whom it is performed. SOP is a guideline or a reference to perform job duties in accordance with the function and performance assessment tool organization or institution (government agencies), based on technical indicators administratively and procedurally, which in accord with working procedures and systems at the concerned unit. The preparation of SOP is

based on (1) Presidential Instruction No. 7 of 1999 on the Establishment of System and Procedure Activity, Preparation of Government Performance Accountability. (2) Decree of the Minister of State for Administrative Reform No. KEP / 25 / M.PAN / 2/2004 on Guidelines for Preparation of General Public Satisfaction Index Services Unit Government Agencies. (3) Regulation of the Minister of State for Administrative Reform No. PER / 15 / M.PAN / 7/2008 on General Guidelines (institutional, management, and human resources).

The function of an early warning system is to convey information in advance about the physical effects of hazard to people who are affected (Samarajiva, Rohan, 2005). Therefore, early warning systems are complex and require the interrelated relationship between many disciplines, such as natural and social sciences, engineering, governance and public services, disaster management arrangements, the mass media, and community assistance (Paripurno, 2008). Thus, the development and maintenance of warning systems and coordination require a wide array of individuals and institutions contribution. Without the involvement of all stakeholders, such as authorities and government agencies in various sectors at all levels, disaster risk community, civil society organizations (NGOs) or non-governmental organizations or NGOs and private sector, the early warning system will not be effective. Whether the warning is delivered to the public in the disaster risk area or not, it depends on the awareness and ability to carry out the roles and responsibilities of all actors in the chain of communication.

#### 4.2.1 The Role Of The Parties In An Early Warning Volcanoes Sinabung

The Role of Sinabung Volcano Early Warning Communication chain allows the dissemination on the early warning hazards of volcanic eruptions and lava as well as landing timely and effectively. News and direction are issued by the competent authorities and the use of communication channels is agreed upon, so that people who are at the dangers of volcanic eruptions and lava can leave and save themselves from the area before the danger comes. The chain of communication at each volcano is connected by Volcanology and Geological Hazard Mitigation (PVMBG) to the public at vulnerable areas which are prone to volcanic eruption and lava. The parties involved in the communication chain of early warning include: the Center for Volcanology and Geological Hazard Mitigation (PVMBG), National Disaster Management Agency (BNPB), Local Government, particularly Prevention Disaster Agency (BPBD) of North Sumatra province and Karo district, television station (TV) and radio in national and regional level (government and private), the Indonesian Armed Forces (TNI), the Indonesian National Police (INP), Society for Disaster Management Organisation (CBO PB) as the Indonesian Red Cross (PMI), radio Inter Indonesian Population (NEAT), Organization of Inter Radio Population of the Republic of Indonesia (ORARI), Standby Force disastrous (Satgana), disaster Response Team (Tagana), Search and Rescue team (SAR), Youth, community disaster risk through the village chief and the village council (BPD), cellular service provider, and hotel manager/tourist attractions. The institutions that play a role in the chain of Early warning are obliged to provide confirmation immediately that they have received the news chain of early warning information sent by PVMBG.

- PVMBG is an institution under the aegis of Geology - Ministry of Mineral Resources and Energy, the observation and monitoring of Mount Sinabung. PVMBG has a mandate to provide information about the conditions and determine the status of Mount Sinabung, provide advice/recommendation to the Government through BNPB, to North Sumatra Provincial

Government and District Government of Karo and BPBD, for subsequent use in formulating disaster-response policies and following up for people in disaster prone areas. Sinabung Volcano Observation Post (PPGS) in the district of Simpang Empat is the representative of Karo PVMBG.

- BPBD and Karo regency government are obliged to coordinate with the Local Government Unit (on education) to determine the appropriate policy advice/recommendation to PVMBG, and hereinafter inform the public in Disaster Prone Areas (KRB) of Mount Sinabung through local government entities in sub-district, village chief and BPD. BNPB and BPBDs of North Sumatra Province obligation is to support the district policy. When the warning status is in Level IV, the Local Government of Karo is the only party in the chain of early warning communication of volcanic eruption hazards that has authority and responsibility to decide and announce the evacuation status officially based on the advice/recommendation of PVMBG. Local Government is responsible for promptly and widely announcing and providing clear direction and instructive to assist the residents in the KRB to act quickly and appropriately to face the danger of volcanic eruptions.
- TNI-Police is obliged to follow up the status of volcano news and volcano conditions presented by BPBD. TNI- Police can play a role in efforts to disseminate the news on the volcano early warning status of volcanic eruptions, especially at the local level. Police Force can support the community's response to any change in status, including people evacuation. TNI-Police is also obliged to prepare immediate emergency response, search and rescue activities and emergency assistance.
- It is obliged to follow the news on education and the status of volcano early warning news and lava volcanic eruption delivered by BPBD. Education plays a role in efforts to disseminate the news on the volcano early warning status of volcanic eruptions, especially at the local level. Education can support the community's response to any change in status, including people evacuation. SKPD is also obliged to prepare immediate emergency response, search and rescue activities and emergency assistance.
- Community leaders, at sub-district, village chief and BPD, are obliged to follow up the news status of volcano and the early warning news of volcanic eruptions and lava submitted by BPBDs. Community leaders ensure that the news dissemination and the news on the volcano early warning status of volcanic eruptions have been delivered to the community. Community leaders ensure the community's response to any change in status, including the evacuation. Community leaders are also obliged to immediately prepare the emergency response, search and rescue activities, and emergency assistance.
- Radio Stations - TV national or regional (government and private) must broadcast the news on the volcano early warning status of volcanic eruptions and lava, and suggestions submitted by BPBD. TV and radio stations are parties in the communication chain of early warning of volcanic eruptions that have a direct and quick access to the public. TV and radio stations are obliged to immediatly suspend the ongoing broadcast and broadcast the early warning of volcanic eruptions and lava hazards, as well as suggestions received from BPBD to viewers and listeners.
- Vulnerable people, both inside and outside the disaster-prone areas (KRB), are entitled to inform about the dangers of volcanic eruptions as well as instructive directives allowing people who are in danger to act appropriately and quickly. Communities are responsible to save themselves from the dangers of volcanic eruptions. Individuals and public bodies are required to

forward the correct information and direction to others. PB organizations participate in the dissemination of news regarding the status of volcanoes, volcanic eruption early warning news and lava, as well as suggestions submitted by the social organization and religious society by facilitating the process happened in the community.

- Mobile service provider is one part of the chains in the volcanoes news status and early warning of volcanic eruptions and lava through SMS mode. These service providers are obliged to pass on the news status of volcanoes and volcanic eruption early warning of BPBDs to the registered mobile users. Internally, they need to provide higher service for sending SMS from BPBD. Thus, where it happens the solid currents SMS, SMS from BPBD will take precedence to get to the user. In addition, they are required to keep the servers for these services remain operational continuously and well. All these services are free of charge. There are two types of news formats on hazard warning status volcanic eruption. Short text format is used for dissemination via short messages (SMS) with a limited number of characters (160 characters). While, long text format contains more complete information in the form of a letter for dissemination via facsimile, electronic mail, and web sites. The outline for the text formats length are: (a) the head of the document which shows the charge of resources, namely PVMB as official warning news provider; (b) institutions which are concerned as the ones having main mandate for this information; (c) information content consisting of 5 (five) components, namely the first component/introduction containing a description of the volcanoes general character, the second component containing a visual observations and seismicity observations, the third component containing potential hazards that occur in the form of solids, liquids and gases and lava, the fourth component which is the conclusion, the fifth component which is the recommendations for local governments and communities; (d) the person who is in charge of information, in this case is the head of PVMBG; and (e) a list of stakeholders who need to pay attention on this information..

#### 4.2.2 Status, Recommendations and Community Work

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Status is part of the volcano **early warning system** followed by **a series of** actions that demonstrate the preparedness at the community level.

Table 2: Status, Recommendations and Community Work

Volcano Status	Recommendations	Community Activity & BPBDs
Normal	Community in KRB I and II can perform everyday activities.  Communities in KRB III, are allowed to hold daily activities with the increasing awareness and obliged to comply the prevailing provision of local government with the appropriate technical recommendations from geological body, ministry of energy. This step is the preparation for KRB III society.	1 Socialization of mineral resources map KRB 2 Understanding the character of volcanic hazards 3. Public understanding on the residence location in the KRB 4 Documenting the residents in vulnerable areas 5. Documenting resource in disaster prone areas 6 Preparation of standard operating procedures/standard operating procedures 7 Preparation of evacuation routes and lanes marked 8. Training on preparedness



Emergency	<p>Vigilant Society in KRB I is still able to hold general activities with the increased alertness;</p> <p>People in KRB II can still perform activities day-to-day with the increased vigilance to hazards;</p>	<ol style="list-style-type: none"> <li>1 Dissemination of information increase in the status of geological bodies.</li> <li>2 Updating population data in disaster prone areas</li> <li>3 Updating vulnerable populations in disaster prone areas</li> <li>4 Documenting resource in disaster prone areas</li> <li>5 Intensified</li> <li>6 Preparation of equipment and communication systems</li> <li>7 Preparation of an evacuation plan</li> <li>8 Preparation of evacuation transportation</li> <li>9 Preparation of refuge</li> <li>10 Preparation of a common kitchen</li> <li>11 Explanation to the community</li> <li>12 Group division</li> </ol>
Alert	<p>Community Alert in KRB I increases the vigilance by not doing activity around the valley rivers that disgorge in the peak area;</p> <p>People in KRB II start to prepare for refuge while waiting orders from government area according to technical geological bodies recommendation, ministry of energy and mineral resources; Communities in KRB III are restricted to have activity around the crater</p>	<ol style="list-style-type: none"> <li>1 Dissemination of information increase in the status of geological bodies.</li> <li>2 Warning signs are ready to operate</li> <li>3. Evacuation transportation equipment is ready for operation</li> <li>4. Place of refuge is ready for operation</li> <li>5. Operating public kitchen</li> <li>6 Security is prepared and activated</li> <li>7 The procedure remains activated</li> <li>8. Equipment and communications systems are activated</li> <li>9 Determination of emergency response command</li> </ol>
Caution	<p>Society in KRB I, II, and III are immediately evacuated based on the recommendation of local government with appropriate technical recommendations of the geological body, ministry of energy and mineral resources.</p>	<ol style="list-style-type: none"> <li>1 Dissemination of information increase in the status of geological bodies.</li> <li>2 The warning signs sound</li> <li>3. Oral and written evacuation command from the commander of the emergency response.</li> <li>4. Procedure remains activated</li> <li>5. Evacuation done</li> <li>6 The evacuation operation</li> <li>7 Common kitchen is operated</li> <li>8 Security is operated</li> <li>9. Crisis center perpetrators of Communication Volcano Status and Communication Volcano conditions are operated</li> </ol>

Table 3: Agency and information message

Agency	Determination and status information	Information volcano volcanoes conditions
	Information volcano conditions	
Geological Observations PVMBG-volcano	Determination and information status	Information volcano conditions
Regent, BPBDSKPD, TNI, POLRI	Coordination volcano status	Socialization status of the volcano
BPBD, SKPD, TNI, POLRI, community,	Socialization status of the volcano	

Agency	Determination and status information	Information volcano volcanoes conditions
Media, Community Leaders	Socialization response to volcanic  Volcano response  Evaluation of the response to volcanic	

## 5. Conclusion

Disaster communication management is the management of communication or coordination activities that may reduce the risk of disaster or minimize the vulnerabilities and disaster hazards. Disaster communication management is the responsibility of central and local government together with the community, in realizing the maximum protection for people and their assets from possible disasters. Implementer of disaster communication consists of PVMBG- and geological agency, Center of Regional Disaster Prevention (BPBD), Regional Working Unit (SKPD), Indonesia National Army (TNI), Police of Republic of Indonesia (POLRI), civil society organization, media, society figure, and surely the society itself.

This research generates a recommendation to decision-makers, both central and local government, disaster experts and the public who are expected to further improve personal communication for the implementation of disaster management as one priority in the national development and it can be realized in a variety of regions in Indonesia. SMS Gateway program and disaster communications SOP can be an alternative volcano communication model.

Communication chain enables early dissemination of information regarding volcano eruption. This handout will be released by the agency authority through communication tools, so that the vulnerable society of volcano eruption will have immediate respond to rescue from risky territory before the crisis comes.

Volcano status is an integral part of early warning system followed by sequence means to equip civil society preparedness toward disaster response. Normal status (first level category) comprises of Disaster Prone Area (KRB), understanding of the volcano characteristic, society understanding on the living area within KRB territory, data gathering in prone area, standard operational procedure formulation, and preparing route and evacuation sign through simulation. In alert stage of volcano level, agencies need to conduct the information dissemination of status from geological agency, society data renewal in KRB territory, intensify preparing communication device and mechanism, transportation for evacuation, and refuge facilities such as barrack, public kitchen, and any mechanism. At the second highest status, it needs an increasing intensity of disaster response activities, so does the communication process when the increasing level of volcano status and any other threat. The most important communication aspect is the warning system of early warning sign. At this level, all of the refuge instrumenta will be always ready to be operated and also the activation of disaster response mechanism by related agency. When disaster reaches the peak stage, all early warning signs have to be ringed to force the evacuation process of local people. Therefore, when the condition enters to this stage, every refuge facility has to be ready and activated.

The optimal usage of SMS Gateway and communication procedure will be significant disaster response endeavor. Yet, in order to implement the mechanism, it requires active and responsive participant. Communication helps to reduce the victim and material loss caused by disaster. This study recommends the implementation of disaster communication model via SMS gateway for government and community-based to mitigate the disaster of Mount Sinabung.

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### References

1. Badri, Muhammad, *Pemberdayaan Komunikasi Pemuka Pendapat Dalam Penanganan Bencana Gempa Bumi Di Yogyakarta (Kasus Kabupaten Bantul)*, Bogor, Tesis Sekolah Pasca Sarjana Institut Pertanian Bogor, 2008.
2. Daunghima, Wittaya; Hokao, Kazunori, *Analysing the Possible Physical Impact of Flood Disasters on Cultural Heritage in Ayutthaya, Thailand*, International Journal of Sustainable Future for Human Security, J-Sustain Vol. 1, Inc; 2013:1: 35-39.
3. Junaedi, Fajar, *Manajemen Penyiaran Berita Bencana*, bagian dari buku Komunikasi Bencana, editor Setio Budi HH, Yogyakarta, Penerbit Buku Litera kerjasama dengan ASPIKOM dan Perhumas, 2011.
4. Lestari, Puji, *Manajemen Komunikasi Bencana di Daerah Rawan Bencana (Studi pada bencana gempa bumi di Kecamatan Gantiwarno Klaten)*, Yogyakarta, Jurnal Ilmu Komunikasi Terakreditasi UPN "Veteran" Vol 5, 2007:3:197-209.
5. Lestari, Puji, Susilastuti, dan Retno Hendariningrum, *Manajemen Konflik berbasis Budaya Lokal sebagai Upaya Meningkatkan Jati Diri Bangsa Indonesia*, Jurnal Komunikasi Ikatan Sarjana Ilmu Komunikasi (ISKI), Vol 1, 2009:1:73-96.
6. Lestari, Icha, Agung Prabowo, Arif Wibawa, Retno Hendariningrum, 2013, *Manajemen Komunikasi Bencana Sinabung 2010 Saat Tanggap Darurat*, Yogyakarta, Jurnal Ilmu Komunikasi Ilmu Komunikasi Universitas Atmajaya, Vol 10, 2013:2:139-158.
7. Nugroho, Heru, *Bencana Alam dalam Perspektif Sosio Kultural Menuju Politik Bumi yang Melestarikan Lingkungan*, Jurnal Dialog Kebijakan Publik, Edisi 1 / Juni / Tahun II / 2008, Jakarta, penerbit Departemen Komunikasi dan Informatika, 2013.
8. Noviani, Ratna, *Bencana dalam Narasi Media: Kajian Naratif Berita tentang Erupsi Merapi 2010 dalam Program Breaking News di Metro TV*, dalam buku Merapi dalam Kajian Multi disiplin, Editor: Hasse, dkk., Sekolah Pascasarjana Universitas Gadjah Mada, Yogyakarta, 2012.
9. Paripurno, Eko Teguh, *Manajemen Resiko Bencana Berbasis Komunitas: Alternatif Dari Bawah*, Jurnal Dialog Kebijakan Publik Edisi 1 Juni, Tahun II, 2008, Jakarta, Departemen Komunikasi dan Informatika, 2008.
10. Samarajiva, Rohan, *Policy Commentary: Mobilizing Information And Communications Technologies For Effective Disaster Warning: lessons from the 2004 tsunami*, Srilangka, New Media Society, SAGE Publications, 2005; 7: 731.
11. Rod SK., Botan Carl, Holen Are, *Risk communication and the willingness to follow evacuation instructions in a natural disaster*, Health, Risk & Society, Vol. 14, Routledge, 2012; 1: 87-99.
12. Solihin Agus, *Potensi Bahaya Dan Kondisi Terkini Gunung Sinabung*, Makalah Pelatihan Manajemen Bencana Sinabung 16 April 2014, Kementerian Energi Dan Sumberdaya Mineral Badan Geologi Pusat Vulkanologi Dan Mitigasi Bencana Geologi, Inc; 2014; 3,8,28
13. Tarigan, Ronda, (2014), *Manajemen Komunikasi Bencana Gunung Sinabung*, Focus Group Discussion (FGD) di BPBD Kabupaten Karo, 2014.
14. <http://www.psbupn.org/consul/kesiapsiagaan-dan-mitigasi-bencana-gunung-api.html>, (June 25th, 2014)
15. <http://sms.combine.or.id/sinabungaddress> (August 1st, 2014)

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