Disaster Information Management on the Phreatic Eruption of Mount Merapi, Indonesia 2018

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ABSTRACT

On May 11, 2018, Mount Merapi in Indonesia erupted suddenly and then followed by three eruptions on May 21, 2018. The Department of Research and Development on Technology for Geological Disaster (BPPTKG), a governmental body for disaster and geological research, calls it as a phreatic or minor eruption. BPPTKG the announced the warning status of Mount Merapi as "Caution" . Even though the eruption was not dangerous, yet it still scared the people. BPPTKG then created Media Center to provide information for the people regarding the phreatic eruption in 2018. The methodology used was study case with BPPTKG's Media Center as the research object, while the data collection techniques were interview and observation. The conclusions of this research were: first, the use of new media in spreading information about disaster risk reduction is faster, more precise and accurate; second, it is very important to spread and provide information regarding disaster risk reduction to the people according to the target audience and adjusting it with different media's characteristics; third, the challenge in the management of disaster risk reduction the processing of complex numerical data into information in a language that can be easily understood by the people. The purpose is to let the people, rescue department and stakeholders to understand the information easily and to provide recommendations for the disaster risk reduction; fourth, through the role of Clearing House and Buzzer, BPPTKG's Media Center is able to monitor the circulation of information and messages, especially in dealing with rumor and hoax. Fifth, Volcano literacy or called as "Literasi Merapi" is a product of information owned by BPPTKG's Media Center. Literasi Merapi is one way to improve the understanding about volcano phenomena, especially Mount Merapi, as a part of information-based disaster risk reduction methods.

Keywords: *Mount Merapi, information management, disaster risk reduction information, eruption, Mount literacy, hoaxes*

INTRODUCTION

On May 11, 2018, at 7:40 AM, Mount Merapi that is located in Java Island, Indonesia, erupted. It was started with a rumbling sound for 5 minutes, with column height of 5500

meter (BPPTKG, 2018). Not so long after the eruption, BPPTKG, a governmental agency in Indonesia which focuses on geological disaster research, called that eruption as phreatic or minor eruption. Phreatic or minor eruption an eruption that is in form of fragmented gas, water, or rocks, in which the rocks are mixed and liquefied (Kaneshima et al., 1996). Not only once, phreatic eruption occurred again on May 21, 2018. Different to phreatic eruption on May 11, 2019; eruptions that occurred on May 21, 2018, happened respectively at 01.25 A.M, 09.38 A.M, and 05.50 P.M. At 11:00 P.M, BPPTKG team decided to announce warning status Mount Merapi in "Caution" status (BPPTKG, 2018).

Mount Merapi is located in Java Island, Indonesia, between two provinces of Central Java and Yogyakarta. Mount Merapi is located at geographical position of 7 ˚ 32.5 southern latitude and 110 ˚ 26.5' eastern longitude. The height of Mount Merapi is 2914 meter above the surface (Triyoga, 2010). As the most active volcano in Indonesia, Mount Merapi has erupted 27 times since 1990s with more than 1500 dead casualties (Sulistiyorini, 2001) (Permana, Setyowati, Slamet, Juhadi, 2017). Giant eruption in 2010 killed 347 people (Sayudi, Nurnaning, Juliani, Muzani, 2011).

In facing the possibility of phreatic eruption from occurring again and people's panic, BPPTKG established the Media Center. It aimed to provide information regarding the phreatic eruption to the disaster management body, people, and mass media. BPPTKG Media Center tried to bridge the communication and information between BPPTKG and the society.

Before phreatic eruption in 2018, BPPTKG had not had the Media Center. All information was directly controlled by the research team, especially BPPTKG Head. Research team directly communicated with the mass media and disaster response agency. Socialization, press conference, direct interview with the journalist and communication via amateur radio – communication radio- were the methods used in the eruption management in 2010 and years before.

BPPTKG's information management on the eruption in 2010 and years before that used mass media and communication radio. Nowadays, media technology is more complex with different media characters. This made BPPTKG to expand its media reach, especially in the form of new media. The new media used were internet-based media, such as email, Instagram, Facebook, Twitter and Whatsapp. New media offered faster and more effective information access experience (Lister et al, 2003).

Conventional information spreading techniques, such as press conference, are still conducted. Amateur radio or communication radio is also used to monitor the condition of Mount Merapi and it can be directly listened to by the people. The used radio frequency was

165.075 Mhz. This radio frequency was used for observation in 5 observation posts in Mount Merapi, which were in Kaliurang Village, Ngepos Village, Jrakah Village, Babadan Village, and Selo Village. BPPTKG also made a Whatsapp Group (WaG), specifically for journalists and disaster response bodies, to create a communication forum between the journalist and the disaster response bodies. WaG was also made in every people's communities who lived near the Mount Merapi's peak.

The people's response on BPPTKG's Media Center through social media was pretty high. The indicators were the number of like and comments. According to Nur Cholik, BPPTKG Staff for Mount Merapi, stated that information technology during the major eruption in 2010 was not as advanced as in 2018. In 2010, communication and information media was dominated by mainstream mass media and amateur radio. The use of social media such as Facebook and Twitter was also conducted, but the performance was not optimum since the number of smartphones were not as many as nowadays. Facebook and Twitter were commonly used for inter-bodies coordination and communication.

Information management for disaster risk reduction in new media era has different challenges. Half of the people will start to change in the way they access information due to media technology advancement, such as the migration from conventional media to internet. As a media center which handles information, there shall be an understanding about the media characteristics at the present era and how the dissemination method is to disaster risk reduction purpose.

This article answers the question on how information management in BPPTKG Media Center is in dealing with Mount Merapi eruption. This article also answers the second question on how effective the management and dissemination of information through social media is.

LITERATURE REVIEW

Disaster is an incident or event which causes massive damage or the loss of lives (Tiwari, 2015). In *International Strategy for Disaster Reduction,* disaster is a serious function's disorder on communities/society due to the massive loss of human lives, material, economy, and environment, which is beyond the ability of the people to deal with it using their own resources (UNISDR, 2009).

Information on the status of Merapi's eruption was based on the data and conclusion obtained by the researchers in BPPTKG. Data is an initial part of information. Data is a set of something specific that is related with objective fact or independent observation result

(Pearlson & Saunders, 2010). Fact does not have any certain significance, yet it can be easily understood, shared, stored or archived. Data and information are two different matters. Data is specific and objective, therefore, information related to data is given to a person or group in accordance to its needs and purposes (Druker, 1988; Pearlson & Saunders, 2010).

In critical situation of Merapi's phreatic eruption in 2018, information was not only needed to be provided for the public, but also for the affected society, stakeholder, and disaster response bodies. Therefore, there shall be a good information process in managing this information. Information management is the form of planning, organizing, controlling, demonstrating or publishing information (Paul, Sarangi, Chartejee, Chattri, 2012). The challenges in information management are to find the information's needs, to distinguish and to publish it in accordance with the needs of its target audience. Information management shall also be based on disaster risk reduction in which the managed and published information has to be sensitive towards the spirit of reducing disaster risk.

There are many disaster experts who emphasized the importance of "maintaining communication" during a disaster. The most important things in communication and information management during a disaster are information integration, information availability, fast access, precise timing, information update, as well as information standardization (Meissner, Luckenbach, Risse, Kirste, Kirchner, 2002). Information sharing in form of collaboration and coordination is the key to effectiveness, sustainability, precision, accuracy and participation during the recovery period post-disaster (Haddow and Haddow, 2009). However, the effectiveness of disaster communication does not only focus on the post-disaster, but also includes mitigation and preparedness.

Risk communication is a part of disaster communication (Houston, 2012: Houston, 2014). Risk communication in disaster communication highlights risk messages (Witte, 2016). Risk message is the creation of a message which grows the feeling of fear, in which the message focuses to display threat so people will grow a sense of compliance to what the message suggests. Thus, there shall be a risk manager which always looks for an effective way to deliver this risk information to the public.

In providing information during disaster, the method has to be adjusted with the target and the needs. The provision of disaster information is not merely intended for disaster-prone population, but also for the public, educators, media, emergency services, NGO, policymakers, or anyone who might need the information. The purpose is to change behavior or to facilitate the process in disaster management or risk reduction (Coppola and Maloney, 2009). Disaster communication and information is a success if the communication strategy is

conducted properly. There are five critical assumptions in a disaster communication strategy (Haddow and Haddow, 2009, they are; 1). Understanding what information is needed by the customer or partner, then the communication mechanism is made to send the information properly and accurately, 2). Emergency operation's leader has to commit in building effective communication as well as taking part in the communication process, 3) Specific communication has to be involved in every emergency and operation planning to ensure that the communication is delivered on the right time and accurately, 4) Effective communication is based on the precise timing, analysis, and information dissemination from the disaster area. The basic principle is effective communication, such as transparency and honesty, 5) Media, such as television, internet, radio, or newspaper are the most effective communication channels to deliver the information on time and accurate to the public. Building good relations with the media and providing trained staffs who directly work with the media are meant to obtain accurate information and to disseminate it to the public.

As the impact of new media technology, other than involving mass media within the disaster information's dissemination process, disaster information also involves the public. Internet is interconnection networking, a network which connects computers around the world to access one another (Wahono, 2006). The emergence of internet affects the change of media technology, which is then known as the new media. New media is a technology that is based on two main elements: digitalization and virtualization (Lister, 2003). Digitalization is everything that is related with the use of computer. Digitalization is an input process which uses numerical data. By using numerical data, users can easily duplicate data and share to other users easily. Virtual is understood as an interaction experience in new forms: image and technology simulation. Virtual is also a metaphor of space and time through information communication network. Virtual is real, yet not concrete (Shield, 2003), real but also related to abstraction.

Unlike conventional media that is passive, new media is interactive. Media users have power over the media's text. User is more independent in building the relations with the knowledge source. The network is connected worldwide, simplifying access from one interface to another quickly and easily.

Social media is an important tool of communication and information in disaster response (Yate & Paquette, 2010), since social media consists of tools that enables information exchange online through interaction and conversation. Social media includes blogs, micro blogs, social bookmarking, social networking, forums, collaboration creation of document such as Wiki, audio sharing, photography, design or video (Balana, 2012: Alexander, 2014).

In medical field, social media is able to disseminate information quickly and spontaneously, like social media network in Thailand and Indonesia about dengue fever disaster. Social media can be used for collecting and spreading updated information in disaster area (Qu, Huang, Zhang, 2011).

The use of social media by governmental bodies in disseminating disaster information requires different conditions (Montagut & Anson, 2013). In the past, information was created independently by bodies or agencies, but with the development of social media, information has become much more complex. Social media information involves public and other bodies, such as the involvement of traditional, public, and private organization's mass media. The characteristic of information changes as well, from just merely produced to be merely read by the public into "shared" as well.

METHODOLOGY

This research used study case approach. The characteristic of a study case is the development of in-depth description and analysis on one or various cases (Yin, 2006). The research object was Media Center for Geological Disaster Technology Research and Development Center (BPPTKG). BPPTKG is located in Cendana Street, Yogyakarta Province, Indonesia. The research period was from May to August of 2018. Within this research, the data were collected using observation on participants, interview, as well as document exploration and collection. Interview is an interaction in which sharing of rules, responsibility, feeling, trust, motive and information are shared (Steward and Cash, 2008: Herdiansah, 2013). Other than interview and observation, the other data source was documents.

This research was limited to Merapi's phreatic eruption in 2018. Phreatic eruption happened in 2013 and 2014 in low frequency. Phreatic eruptions in 2013 and 2014 only occurred once a year. Phreatic eruptions in 2018 occurred in May to August of 2018, with five eruptions in total. On August 19, 2018, BPPTKG changed the status of Mount Merapi from phreatic (minor) to major eruption. This was proven by the creation of lava crater on the peak of Mount Merapi (BPPTKG, 2018).

RESULTS AND DISCUSSION

It is difficult to predict when an earthquake is going to happen, but volcano can be monitored and predicted. Monitoring when a volcano is going to erupt can be seen from

several indicators, such as the mountain's morphology, repeated shallow earthquake or the creation of lava crater. Thus, before an eruption occurs, the volcano monitoring agencies like BPPTKG will be able to inform the people and the rescue team to prepare for disaster possibility.

Mount Merapi's phreatic eruption case in 2018 is different compared to major eruption. Phreatic eruption cannot be predicted when it will happen, because the characteristic of phreatic eruption is sudden eruption. Even though phreatic eruption is also called as minor eruption and considered as not dangerous in a certain radius, but its loud sound and strong vibration still cause the people to panic. Thus, BPPTKG created Media Center, to provide information about Merapi's phreatic eruption. Its purpose is to provide updated information to the people about the status of Mount Merapi.

Managing Information: Altering Data into Information

BPPTKG always produces data of Mount Merapi's update, especially during the phreatic eruption incidents in 2018. However, not everyone was able to understand the data. The outcomes were geological or seismic data which could only be understood by geology or volcanology experts, while these data had to be disseminated and shared to the public as a part of its information duty. Therefore, before it was published to the society, the data had to be transformed into information that was understandable by the common people.

The alteration of data form into information is one of BPPTKG's efforts to avoid misperception by the people. Data and information are two different things. Data is a set of things that is specific, related to objective fact or independent observation result inform of fact which has no certain significance but can be easily understood, shared, stored or archived (Pearlson & Saunders, 2010). Information that is related with data is given in accordance with its need and purpose (Druker, 1988; Pearlson & Saunders, 2010).

In the process of delivering information about the status of Merapi's phreatic eruption in 2018, BPPTKG Media Center observed the most popular and most used words among the people within the context of volcano and eruption. These keywords were then studied by the Media Center to be the material for developing information that can be easily understood by the people. For example: things that became the common concerns of many people were Mount Merapi's Status -level I/Normal, level II/ Caution, Level III/Caution Alert, Level IV/Danger-, pyroclastic flow, and danger radius from the creater.

Information message is packaged in disaster preparedness approach. The characteristics of disaster preparedness information are actual and conclusive, including the

recommendations about what the people should do at that time. Information with disaster preparedness approach is a part of building people's motivation towards their awareness on hazards and risk perception (Paton, 2003), especially the local people who live around Mount Merapi.
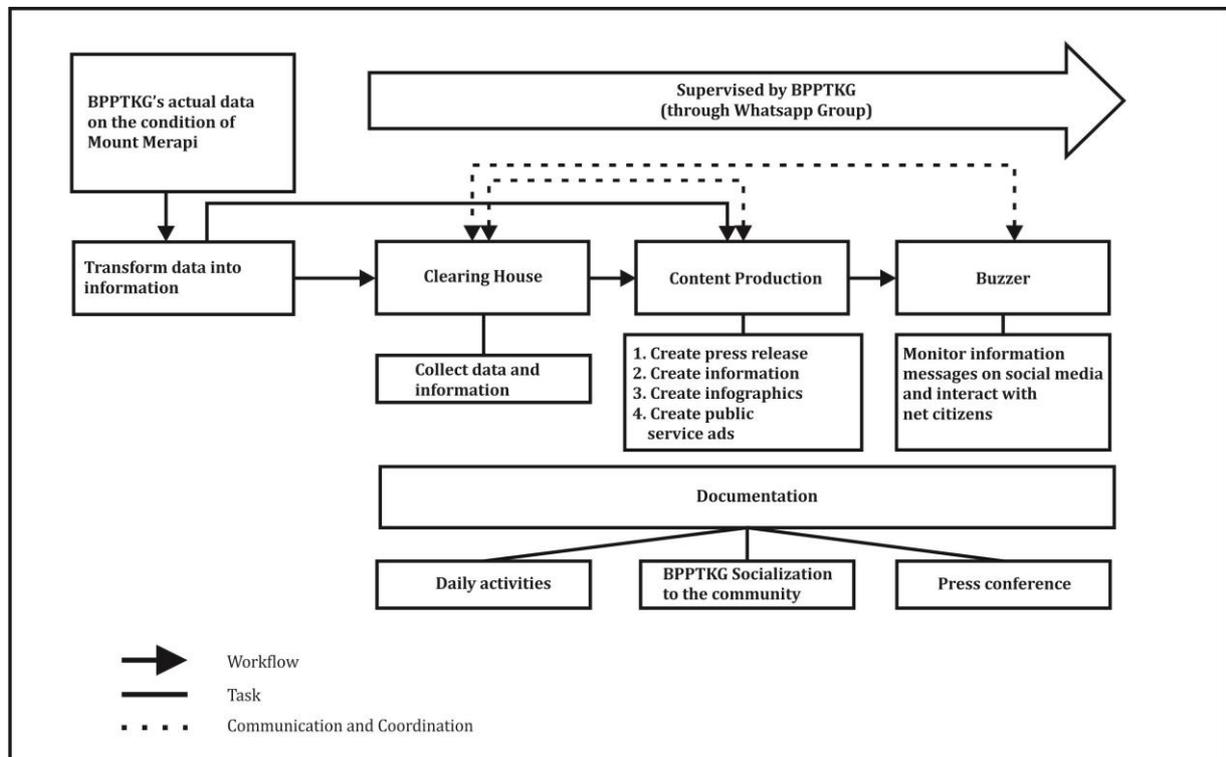

Figure 1. Model of BPPTKG Media Center's Information Management.
Note: The information management flow of BPPTKG during Merapi's phreatic eruption crisis in 2018. The information management flow is re-narrated by the researcher.

The information management flow of BPPTKG was started by releasing the data of Mount Merapi's condition by BPPTKG Volcano Researchers. The data were usually in forms of geological, chemical, or seismic charts. Then, the data would be processed and altered into information. Clearing House Division was responsible for transforming the data into information. Furthermore, Clearing House was responsible for collecting the information needs (see Figure 1). Not only Clearing House was responsible for collecting information needs, but also categorizing them.

Content Production was responsible for making the information message. Content Production division produced many types of information, such as making press release, making information content for social media, making information graph, as well as making the advertisement for public service.

If Content Production is in the level of message production, then Buzzer is in the level of receiver. Buzzers' duty is to monitor and to protect the information message after being published to the social and mass media. If there is any miscommunication or unsynchronized information after being published to social and mass media, then it can be responded to quickly. Buzzer also observes netizens' feedbacks regarding the information. Commentaries and questions are monitored, if the commentary or question is crucial to respond to, then it will be answered by the expert through buzzer team. Buzzer team will post commentary or questions to the WAG of the media center team, then the commentary or question will be answered by the experts, then the answers will be posted in the social media by the buzzer. The buzzer team is divided into 2: bot buzzer and human buzzer (Ibrahim, Abdillah, Wicaksono, Adriani, 2015). BPPTKG involves few human buzzers, and managed by human, not robot.

Documentation Division is a division which recorded every BPPTKG activities when dealing with the phreatic eruption in 2018, such as BPPTKG team's activities when educating the condition of Mount Merapi to the people, press conference, and relations with other institutions. Documentations were in photo and video. The activities of all divisions –Clearing House, Content Production, Buzzer and Documentation are observed by BPPTKG (see figure 1). The detail can be seen in Table 1.

Table 1: Divisions in BPPTKG Media Center and their Job Descriptions.

Division	Job Description
Clearing House Division	Collecting all data and information for content production and buzzer needs, especially during emergency (phreatic eruption).Clearing House Division collects data and information, understands flow of data and information and verifies them.
Content Production Division	Making the content of information message that is adjusted with the media type and spread it. In normal condition, this division also produces additional information about the literacy of Merapi, geology, and volcano.
Buzzer Division	Monitoring messages that have been released on social media, self-defining in every type of social media and protecting information.
Dokumentation Division	Documenting daily activities during Merapi 2018 crisis, documenting BPPTKG's campaign to the people, and documenting press conferences.

Source: BPPTKG Media Center re-narrated by the researcher.

The Effectiveness of the Use of New Media in Disaster Condition

In disaster condition, social media can spread the information quickly (Acar and Muraki, 2011). In mass media, information needs to be selected and framed by the redactor before the information is published; but social media does not. BPPTKG Media Center chose social media because it is able to reach more people faster. In mainstream mass media, information

needs to be carefully selected and framed by the media for political or economic interest of the media. The mass media obstacle that happened during phreatic eruption in 2018 was that BPPTKG releases had to be re-selected by the editor to be adjusted into the media's interests. Therefore, the information published by BPPTKG and mass media might be different.

If the content of information on mainstream media is influenced by the media's ideology, routine, and ownership (Shoemaker and Reese, 1996), then BPPTKG Media Center, in building the redaction policy is based on disaster risk reduction. In Mount Merapi eruptions in 2006 and 2010, the information media were mostly conventional media: mass media and community media. The community media used was community-based transmission radio and amateur radio (communication radio). Community-based radio was also less effective because it was only accessible to limited radius of 2-5 km, and so was amateur radio because only few people owned it.

In Merapi eruptions in 2006 and 2010, a community that managed the inter-communities interaction and information around Mount Merapi was established, namely JALIN MERAPI (*Jaringan Informasi Lingkar Merapi*) or Information Network around Merapi (Afrizal, *et.al*, 2007). JALIN MERAPI is a community of the people around Mount Merapi which tried to bridge the information about Merapi's condition and disaster to the people by utilizing all types of media. JALIN MERAPI tried to combine conventional media and new media during the eruption crisis at that time. At that time, JALINE MERAPI successfully bridged all societal communities whom were affected by the eruption disaster. According to Elanto Wijoyono, one of the initiators of JALIN MERAPI, there are 8 communities in JALIN MERAPI (interview, 2017). During a disaster, information sharing in form of coordination and collaboration are the keys to effectiveness, sustainability, punctuality and participatory (Gillmor, 2006; Haddow and Haddow, 2009). What JALIN MERAPI did was a part of the importance of information management during disaster condition, which was based on participation, effectiveness, and punctuality.

Despite of JALIN MERAPI's effort to combine media technology, the ownership on information technology was still limited. Therefore, the role of stakeholders and prominent figures of that area was very crucial in spreading the information conventionally to the people. As mentioned by Subagyo (43 years old male), the Chief of Pangukrejo Hamlet, Umbulharjo Village, that mosque played very vital role in spreading emergency information because it could be heard by the people around the area (Interview 2017).

Mosque was a very strategic local media during the eruption disaster in 2006 and 2010. Mosques in Indonesia mostly use big speaker for *adzan*. *Adzan* is a loud voice to call people

nearby for pray. *Adzan* sound can be clearly heard until 500 meter. However, phreatic eruption case in 2018, the management of Pangukrejo Hamlet mosque never used mosque's speaker to announce the information about the phreatic eruption, because the people had already been able to monitor it through their own mobile phones. (Interview with Suripto, male, 47 years old).

In Mount Merapi's phreatic eruption in 2018, BPPTKG Media Center tried to maximize the use of new media to public and specific target audience. Specific society refers to SAR – rescue agency, local disaster management agency – BPBD, volunteers and NGO who needed information for Merapi disaster management. BPPTKG's information could be directly received by the stakeholders of people who had direct needs for the information. Throughout the whole experience of BPPTKG Media Center in managing information, there was only one inaccurate interpretation to the information, which was when Kompas TV informed that the lava was already on the peak of the mountain, on May 23, 2018.

The problem of inaccurate information interpretation on mass media was caused by several factors. First, the journalist who was in charge as the news contributor lacked the knowledge on geology, volcanology, and disaster risk reduction. Contributor is someone that is placed in a specific area by the media redactor to collect information and data of an incident (Hidayat and Anisti, 2015). The second is the role of editor or redactor, who has the policy to frame the news for the media's interest. Even though the information from journalists are already clear, but the content may be reduced or modified after being placed on the redactor desk for their mass media's interests. Third, the lack of knowledge on disaster risk on editor level may affect the news content. The impact of inaccurate information may cause the people around Mount Merapi to panic. The inaccurate news of Kompas TV on May 23, 2018, was then directly confirmed to the media through journalists WaG that was managed by BPPTKG.

Based on observation, the types of information that were circulated during the phreatic eruption crisis of Mount Merapi in 2018 were divided into three: emergency, actual, and daily information. Emergency information is information which is intended to be delivered quickly to the target. Emergency information is sent when the phreatic eruption occurs, or soon after it occurs. The information on the condition of Mount Merapi or its post-eruption condition is very crucial for the rescue team, stakeholder, and people who live near Mount Merapi. Thus, quick information dissemination is very important for the recommendations making of disaster risk reduction. This information dissemination may be sent through email, radio, WaG, or phone.

The second information is actual information. After the fourth phreatic eruption on May 21, 2018, BPPTKG, BPPTKG Media Center released information daily or once in three days about the condition of Mount Merapi. For some time after the eruption, BPPTKG often sent the information about the Mount Merapi's condition daily, but it was sent once in three days or even a week on July and August. Media Center team had some strategies to prevent the information from being distorted. First, the information was delivered to BPBD, a local governmental agency for disaster reduction and emergency. BPBD which received the message via WaG was BPBD of Sleman Regency–West part of Mount Merapi, BPBD of Boyolali Regency – North part of Mount Merapi, BPBD of Klaten Regency – East part of Mount Merapi, BPBD of Central Java Province – provincial level post, directly coordinating with Boyolali, Klaten, and Magelang area-, and BPBD of Yogyakarta Province – provincial level post, which directly coordinated with Sleman regency. Second, the information was delivered to mass media through press release via journalists WAG and BPPTKG social media. During the phreatic eruption on May 2018, press conference could be directly held because the journalists were always in BPPTKG office. In August, when Merapi no longer frequently erupted, press conference was conducted by inviting journalists. BPPTKG chose press conference because journalists could directly ask Mount Merapi researchers to create one perception on one information.

The third information is daily information. The purpose of BPPTKG Media Center was to build "Literasi Merapi". Literasi Merapi, according to Mart Widarto, a supervisor in BPPTKG Media Center, refers to the understanding on Mount Merapi. For Mart, Mount Merapi is a blessing of fertile land, but the people who live around Merapi also need to be prepared to face the threats of Mount Merapi.

Unlike emergency and actual information which involved mainstream media in spreading information, daily information can directly be uploaded to BPPTKG's social media. Literasi Merapi daily information is not a type of information which needs to be delivered quickly to the people and rescue team or stakeholders. Literasi Merapi activities included the making of content about informative knowledge or inspiring knowledge about geological information, history of Merapi and its eruption, as well as the stories from the environmental activists, artists who lived in the feet of Merapi.

The researcher also conducted interview with purposive sampling approach to some people in Umbulharjo Village, Sleman Regency, Yogyakarta. Umbulharjo Village is a village in the southern part of Mount Merapi which is really prone to eruption. It is located about 7 to 8 km from the peak of Mount Merapi. On the eruption of Merapi in 2010, half of the village

was destroyed to dust due to pyroclastic flow. Pyroclastic flow is the ruin of lava crater which forms the cloud in high temperature and high speed (Neri, et.al, 2003). The local people often call it as *"awan panas"* or *"wedus gembel"* in their local language, which means sheep, because the cloud resembles sheep fur. Pyroclastic flow is the primary threat of Mount Merapi (BPPTKG, 2017). There were 41 people dead in that incident. There were so many people died in Kinahrejo area, a sub-village located in the upper part of Umbulharjo Village (Sayudi, Nurnaning, Juliani, Muzani, 2010).

In the phreatic eruption in 2018, half of the people of Umbulharjo Village always paid attention to the information from BPPTKG Media Center. The information spread by the BPPTKG was their main information. Other than seismic wave that can be heard using communication radio wave, direct information on the condition of Mount Merapi could also be obtained through the monitoring radio of BPPTKG Mount Merapi that was located in Kali Urang Village. The frequency wave of Mount Merapi monitoring could be heard by the people around Merapi, especillay in Cangkringan District. The distance between the BPPTKG's Mount Merapi monitor to Cangkringan District is only 3 km.

Social media became the most popular media to obtain information regarding the phreatic eruption of Mount Merapi. But not everyone was able to use social media as the main source of information about Merapi eruption. Age factor affects the use of media in obtaining information about Mount Merapi. Cici Febrianti, (female 21 years old) chose Twitter social media to monitor the situation development of Merapi. According to her, information on Twitter is faster. She always monitors the information from BPPTKG, BPBD of Sleman Regency or Rescue Agency of Sleman Regency (interview, 2018). The purpose of monitoring information from SAR or BPBD was to obtain information if there is any instruction to evacuate.

Triyono (Male, 34 years old) from Kaliadem chose Wag of Umbulharjo Village to obtain actual information from BPPTKG. One staff from BPPTKG also joined the group so that BPPTKG would be able to directly deliver the information and monitor the information that the people receive (interview, 2018). Tri Wahyuningsih (female, 58 years old) and Tukirno (male, 45 years old) relied on the information from her children who use social media. Tri Wahyuingsih and Tukirno were still comfortable in using conventional mass media to know the condition of Merapi, especially television, Newspaper were difficult to access in Umbulharjo because of the geographical location. Tri Wahyuningsih and Tukirno also still used traditional approach in looking at the condition of Mount Merapi. According to them, if

Merapi is in danger condition status, the animals will come down to the people's residence and the temperature will increase (interview, 2018).

Japan's Tsunami in 2011 became an important lesson that social media possesses very crucial role in disaster management. Through social media that connects so many people, we can monitor the condition of the people whom are affected by the disaster in real time. The victims provide information and other people share the information to even wider audience (Acar & Muraki, 2011). Direct and fast information to the people makes social media to be more preferred by the people of Merapi.

Media technology that changes makes the people to change as well in the context of access to information. Merapi eruption in 2006 and 2010 became a valuable lesson for the people of Umbulharjo Village that biased information from mass media and sensational content makes the people to become unsympathetic to mass media. As what Mulyono (male, 37 years old) mentioned that mass media's information is not really important because mass media only shows post-disaster information, not what happened before. According to Mulyono, mass media only reported in post-disaster or during disaster emergency only. Mass media rarely involves itself during mitigation or disaster preparation.

On the eruption in 2010, three national mass media of Indonesia reported incorrect information (Juanedi and Sukmono, 2017). ANTV, a national television, reported a shop burglary that was located in the disaster area. Then it was found as a wrong information after being clarified. The incident occurred when a group of people cleaned the environment of post Merapi eruption in 2010. A shop that was damaged by the disaster allowed the people who cleaned to take foods and drinks from that shop. Then, a journalist recorded that activity and displayed on the news with the title of "burglary". TVONE, a national TV, reported that the pyroclastic flow had reached the urban area of Yogyakarta. This created panic among the people of Yogyakarta and area around it. The distance from the peak of Mount Merapi and Yogyakarta City is 35 Km, while pyroclastic flow can only reach 7 km from the mount peak. When the eruption in 2010 happened, "Silet", a showbiz program from RCTI, reported that the eruption of Merapi in 2010 will become even bigger. What makes it interesting is that it was concluded through myths.

The Openness of Information Versus Hoax
The openness of information that was conducted by BPPTKG Media Center and the ease of the people to directly interact related to the condition of phreatic eruption in 2010 minimized biased and hoax information. Based on the result of 4-months observation from

May 21 to August 20 of 2018, Media Center clarified four biased and hoax information. First, the news from Kompas TV which stated that the lava already reached the mount's peak. Second, the widespread of video stating that the lava had already gone down from the mount's peak. After the video was tracked, it was found that it was the video of Mount Marum/Ambrym's crater which was claimed as the mount merapi'crater. Third, the issue which stated that there would a big eruption right on the day Mbah Maridjan died on October 26, 2010. Mbah Maridjan was the prominent 'key holder' of Mount Merapi. He died because of pyroclastic flow which destroyed his house. According the calendar of Javanese ethnicity, a calendar that is still believed in by a portion of people in Java, showed that Mbah Maridjan died on Tuesday *Pahing*, *Sawal* month of 1943, Javanese year. *Pahing* is one of five "*pasaran*" or days in Javanese calendar, they are: *pahing, legi, kliwon, pon and wage.* The purpose of *pasaran* days is to identify days in a month. During phreatic eruption in 2018, Tuesday *pahing* of *Sawal* month happened to be on Tuesday, June 26 of 2018. The people were afraid of big eruption on June 26, 2018, which was precisely the same date when Mbah Maridjan died in the eruption of 2010.

"Mbah" of the name of Mbah Maridjan is a Javanese culture to call a grandfather/grandmother. Mbah is also a title of honor for people who have strong cultural influence and mystical power. Since 1970, Mbah Maridjan had been one of the most influential cultural figures in Mount Merapi. He was also called as "punokawan", which meant the soldier of Yogyakarta Kingdom and "Key Holder" of Mount Merapi (Permana, Setyowati, Slamet, Juhadi, 2017). Mbah Maridjan, as the key holder of Mount Merapi, is really trusted by the traditional Javanese people (Lavigne, Coster, Juvin, Flohic, Gaillard, Texier, Morin, Sartohadi, 2008). Yogyakarta region is a special region in Indonesia. Yogyakarta Kingdom is one of the heritages of Mataram Kingdom since the 16th century, with Islam as its basic belief (Woodward, 2004). Fourth, the news that announced that Mount Merapi would erupt during Islamic *Eid* day. *Eid Fitr* is the most celebrated Islamic *eid.* Coincidentally, *Eid Fitr* happened to be on Friday, June 15 of 2018. Friday is always connected with phreatic eruption, because ever since the very first phreatic on May 11, 2018, all happened on Friday. Eid Fitr is an Islamic big day after fasting for one month.

These four biased and hoax information were then clarified by BPPTKG. For Kompas TV case, BPPTKG asked for the right to clarify regarding the incorrect information. BPPTKG also held a press conference to clarify these perceptions to the real situation. In every press conference, a Q&A forum is always provided through press release. About the video of lava

that went viral, this video was then clarified through social media, with the explanation that the video did not happen in Mount Merapi or Indonesia.

The rumor of eruption which happened to be on the same day of Mbah Maridjan's death was the most difficult case to control, because BPPTKG also could not predict when Merapi will erupt again. BPPTKG only provided direct explanations to the people around Mount Merapi and spread the information via social media. The content of the information was that the eruption would not be as damaging as the eruption in 2010. Dewi Sri, a geological researcher in BPPTKG, from a discussion with the people, said that a big eruption like what happened in 2010 will happen in 50 years, so the people who live around Mount Merapi did not need to worry. Similar clarification happened as well on the rumor which stated that Mount Merapi would erupt on Friday and *Eid Fitr*.

CONCLUSION

Managing information in pre-disaster and disaster emergency condition is very important. Good information management in both during the pre-disaster and disaster emergency will affect various aspects, such as political, rescue, and inter-sector communication in disaster management process. With a good information flow, prone-to-disaster people will be able to understand the disaster environment better, to prepare their disaster preparedness condition.

As a contribution for the study of disaster information, therefore, the conclusions are: First, new media became the solution in spreading information during pre-disaster and emergency disaster conditions. Information in new media, especially internet, spreads faster and directly delivered to the target. The information comes from secondary source. Second, in managing information, BPPTKG Media Center builds four main divisions in its media management, which are Clearing House, Content Production, Buzzer and Documentation. The need of these divisions is based on the adjustment of media technology which is more complex and diverse in characteristics. Third, the challenge of BPPTKG Media Center is to inform the data in form of disaster risk reduction. Therefore, BPPTKG requires the complex data to be altered into a language of information that is easily understandable by the people. The purpose is to make the people, rescue team, and stakeholders to better understand the information and they can take the action as recommended in the message. Fourth, regarding rumors and hoax, through the role of Clearing House and buzzer, BPPTKG Media Center is able to monitor the circulation of information and messages to respond to the rumor and hoax. Fifth, Media Center does not only handle content of information related to Merapi crisis, but also to build the literacy on volcano, which is called as "Literasi Merapi". Literasi Merapi is

the light information or soft news about volcano, especially Mount Merapi. Literasi Merapi contains information about volcanology and geology. Literasi Merapi also contains information about inspiring and prominent group or person who lives around Merapi, such as how to build a relation between the nature, culture, and social.

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