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The use of social media for earthquake and Tsunami information

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ABSTRACT

As one of the countries being passed by the Pacific Fire Circle (Ring of Fire), Indonesia is prone to earthquakes. Recently, an earthquake and tsunami occurred. A new disaster occurred in Central Sulawesi, Indonesia, resulting in the destroyed buildings and houses. This occurrence of the disaster was quite shocking to various countries. News of the occurrence of natural disasters immediately went viral through various social media due to the residents' and BMKG's posts. Social media is greatly involved in natural disaster cases as it facilitates analysis on the conditions and situations of earthquake-affected areas. Besides, it also functions to disseminate earthquake information. By using social media, such as Twitter and Facebook, we may rescue the directly affected individuals. It can also be means of sharing information and ways for people in and outside disaster-affected areas to volunteer and provide support-based information to affected individuals. Additionally, social media can perform important assistance functions such as identification of safety, placement of displaced people, provision of damage information, support for disabled people, volunteer organizations, fundraising, and a moral support system. This study discusses the potential usage of social media in disaster preparedness and response, especially in Central Sulawesi, Indonesia, earthquakes and tsunamis.

1. Introduction

Indonesia is one of the countries passed by the Pacific Fire Circle (Ring of Fire). Consequently, Indonesia is prone to earthquakes. Recently, Indonesia just experienced earthquakes and tsunamis, especially in the Central Sulawesi region. This incident has destroyed a number of buildings and houses, with more than 2000 casualties. Information from these natural events has spread quickly in the community through social media, signifying the crucial role of social media in disaster management [1], [2].

Social media is a set of applications and services that connect people to one another using Internet networks [3]. With the presence of social media, users can connect and exchange information in the form of text, images, and videos [4], [5]. The social media that are widely used include Twitter, Facebook, Line, Instagram, and others. In addition to social media, websites, such as Wikipedia and Youtube, are also the means to create content. The use of applications and social media is growing with the development of internet technology, such as smartphones [2].

The Ministry of Communication and Information stated that the number of Internet users in Indonesia is currently very high, reaching 63 million people, with 95 percent of whom use the Internet to access social networks. Social networking sites that are widely accessed are Facebook and Twitter.

Besides, Indonesia is ranked as the 4th largest Facebook user after the USA, Brazil, and India. Further, Indonesia ranks 5th in Twitter users in the world. Another social network known in Indonesia is Path, with 700,000 users, Line with 10 million users, Google+ 3.4 million users and Linkdlin 1 million users [6]–[8].

Social media has great potential but also carries numerous adverse effects, such as misinformation, the digital divide (between users and non-users), privacy, and identity theft [3]. During the 2018 Central Sulawesi earthquake and tsunami, popular social media such as Twitter, Facebook, and Instagram functioned as a means of rescuing directly affected individuals, means of sharing information, and means to volunteer, as well as providing support-based information to those directly affected victims [9]. Additionally, social media is also used to perform important assistance functions such as identification of safety, placement of displaced people, provision of damage information, support for disabled people, volunteer organizations, fundraising, moral support systems, and so forth [3].

This paper discusses the effectiveness of social media in the earthquake and tsunami disasters management in Central Sulawesi. Based on a survey of social media users, social media had an effective role in the earthquake and tsunami in Central Sulawesi. The results of the study are expected to increase disaster preparedness and response in the future.

2. Method

In this study, we garnered data through an online media questionnaire distributed to the general public. There were 14 questions raised related to the use of social media during the earthquake and tsunami in Central Sulawesi. The number of respondents in the study was 64 respondents consisting of 49 women and 15 men. The online questionnaire began to be disseminated in the community from October 5 2018 to October 25 2018. The duration of the research conducted was quite short, which was around 20 days. Those who first filled out the online questionnaire at a time reported difficulty organizing it. Based on the results of the survey, the analysis of various parameters related to social media was carried out for the benefit of the community affected by the natural disaster.

Table.1 Summary of Questionnaire Items

No.	Question	Answer Choice
1.	What is your gender?	a. Male b. Female
2.	How old are you?	a. <18 b. 18-27 c. 28-37 d. 38-47 e. >47
3.	Are you a community affected by the Palu,Sigi and Donggala earthquakes and tsunamis?	a. Yes b. No
4.	Where did you find out information about the earthquake and tsunami in Palu, Sigi and Donggala?	a. TV b. Print Media c. Radio d. Social Media e. Other
5.	Do you use social media?	a. Yes b. No
6.	Do you know information about the Palu, Sigi and Donggala earthquakes and tsunamis through social media?	a. Yes b. No
7.	Do you get information through social media?	a. Facebook b. Twitter c. Instagram d. Other
8.	Are you interested in finding information about the earthquake and tsunami in Palu, Sigi and Donggala through social media?	a. Yes b. No
9.	Are you interested in seeking information on the Palu, Sigi and Donggala earthquakes and tsunamis through social media? if yes, what kind of information search do you use?	a. Based on certain groups b. Use keyword # (hastag) c. Use the description that leads d. Other

10.	What type of information did you receive during the disaster?	a. General information b. Safety information c. Infrastructure information d. Help information
11.	Does information about the earthquake and tsunami disaster in Palu, Sigi and Donggala affect you?	a. Yes b. No
12.	What did you do after hearing the news?	a. Does not do anything b. Redistribute information c. Volunteering d. Other
13.	Do you think social media is able to influence the affected victims of natural disaster?	a. Yes b. No
14	Are you sure or believe in the information contained in social media related to the Palu and Sigi and Donggala earthquakes and tsunamis?	a. Strongly believes b. Believe c. Believe it enough d. Lack of trust

3. Results and Discussion

Among the Indonesian social media users, 85% of them are less than 35 years old, with the majority being from the ages of 14 to 24 years, with a total of 41%. [5] This age group is students who have an important role in holding discussions on social media, so it does not rule out the possibility that the people of Central Sulawesi, especially students, can access and provide information on social media.

Media has an important role in making a public agenda [10], [11]. If the issue of disaster in Central Sulawesi has succeeded in becoming an agenda in the community, the government will automatically put more concern into it and make a policy to overcome the existing problems. Media indifference to disaster issues will be able to exacerbate the losses experienced by the community when they are struck by a disaster. According to Prajarto (2008), the core of the involvement of the media and its workers lies in the issue of providing information. The provision of information in the form of reports and developments in events and direct or indirect actions results in assistance to save people, reduce the number of victims, alleviate the suffering of victims, and reduce other possible losses.

The forms of social media involvement can be realized in various formats of information and news, in the forums in the community, and in actions when a disaster strikes. In addition, the media also plays an important role in providing pre-disaster, disasters, and post-disaster information.

According to Harry Tanoe Soedibyo in Kompas (2013), between Indonesian people who reached almost 250 million, 95% of them got information from television. Meanwhile, the remaining public gets information from the Internet (30%), then radio (23%), and print (12%). From this fact, we can know that public access to mass media or internet-based social media in Indonesia is quite high. Thus, the inclusion of disaster content in mass and social media has a high chance of touching the community directly [12].

At present, reporting on disasters usually focuses on the event only. Furthermore, mitigation and preparedness in the face of disasters are regarded as less interesting content for journalists and social media users. As in the earthquake that occurred in Chile on April 1, 2014, this event became a trending topic on Twitter with #prayforchille. The world community, including Indonesia, expressed their empathy through Twitter related to the disaster in Chile. However, after seeing this phenomenon, public awareness of a disaster is still limited to the occurrence of a disaster. The community has not adopted the information to increase their preparedness in facing future disasters.

The issues of natural disasters have many agencies related to a disaster, starting to touch social media (Twitter and Facebook), such as from the accounts @prayforpalu, @prayfordonggala, and @BMKG, but the news provided is limited to information about disaster events, with minimum issues of disaster preparedness being discussed. Therefore, we need to introduce social media use to the people of Central Sulawesi.

This is of concern to us, given the paradigm shift in disaster management that has taken place in Indonesia and the world. The change in the paradigm of disaster management from the reactive efforts of emergencies towards disaster risk reduction seems to have only involved academics and

practitioners, and it is not yet reaching the media and society. Actually, the government's efforts through BNPB and BMKG to get through the public via mass and social media have been carried out, such as by launching applications to improve preparedness, such as the InfoBMKG-based android application and Bancana BNPB Monitoring. However, the response of the community to disaster preparedness is still very lacking, as seen from the small number of application downloads. Besides, its social media accounts, such as Twitter and Facebook, also have not attracted the public's attention, as observed from their low number of followers and posts about disaster [13]–[15].

Research on the effectiveness of the use of social media in the earthquake and tsunami in Central Sulawesi was carried out using a sample on a fairly small scope of only 64 respondents with 14 questions in the questionnaire. Based on their answers, two questions are classified as poor questions because they get a 100% presentation. The question receiving 100% presentation stated that each respondent who filled out the questionnaire used social media, and the respondents stated that social media could have a significant impact on the affected community. In this study, data were obtained by directly distributing questionnaires to respondents who were active social media users from nearby communities. Easy access and efficient time in delivering information lead us to spread questionnaires through social media. The questionnaires can be increasingly simple and quickly disseminated on social media since it offers a broad global reach. Recently, social media can be easily used by people without an IT knowledge base. Consequently, the respondents can access questionnaires via smartphone or computer with an internet connection. Thus, it is easier for researchers to review the answers.

In the distribution of the questionnaire, we started on October 5, and we got 64 respondents. Each questionnaire was given to the respondent, and the respondent was expected to submit the questionnaire. The respondent's statements are certainly in accordance with the actual situation. From questionnaires distributed to internet users, all can be processed into data that is useful for the continuation of this research. The responses obtained from the questionnaire that we distributed are discussed in the following.

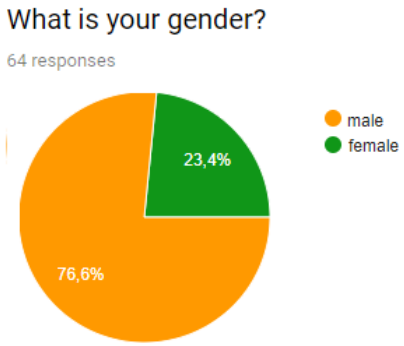

Fig. 1. Graph of the respondents' gender of the respondent

Of the 64 respondents who filled out a questionnaire about the role of social media in the earthquake and tsunami disaster in Central Sulawesi, 49 of them were women, and 15 men. The results obtained indicate that women are more concerned with events such as earthquakes and tsunamis that occur in Central Sulawesi.

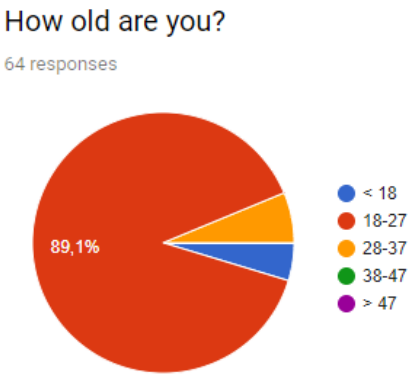

Fig. 2. Graph of the age of respondents

Fig. 2 shows that most of those who responded to the questionnaire distributed were at aged 18-27 years. This shows that the earthquake and tsunami information that occurred in Central Sulawesi was widely distributed by those of productive age.

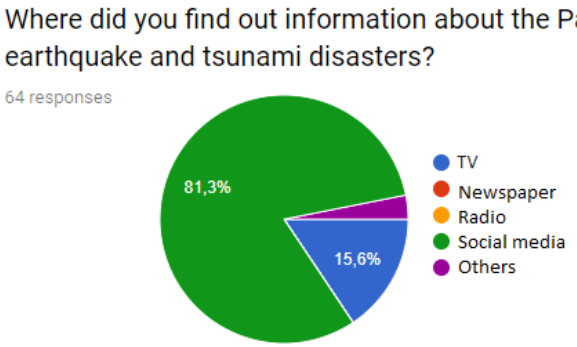

Fig. 3. The public knows information through social media

Fig. 3 illustrates that information about the earthquake and tsunami disaster in Central Sulawesi was disseminated through several media such as TV, social media, radio, print media, and others. The results of this study indicate that 81.3% of the people knew about the event through social media, 15.6% via TV, and the rest through other media, such as getting information from person to person.

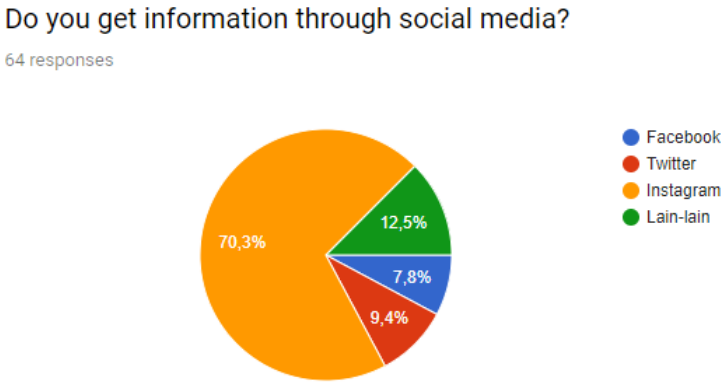

Fig. 4. Types of social media used by the community

In addition, social media that is widely used to obtain information about the earthquake and tsunami is Instagram social media, followed by Twitter, and Facebook, as shown in Fig 4.

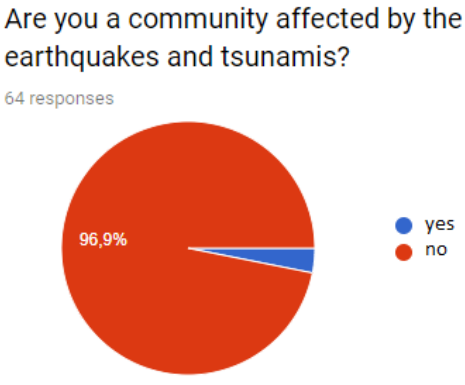

Fig. 5. Community interest in social media

Fig. 5 suggests that many people are interested in finding information about the earthquake and tsunami disasters in Central Sulawesi through social media. Social media is used as an easy medium to get information quickly and precisely.

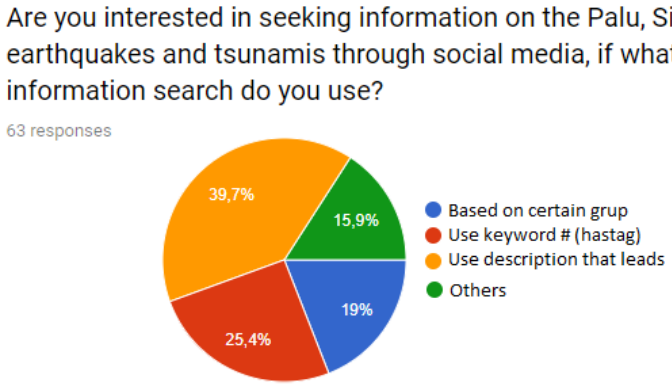

Fig. 6. Forms of information on social media disasters obtained

Fig. 6 indicates that seismic and tsunami information retrieval is obtained through certain groups, uses certain keywords, and searches using event descriptions.

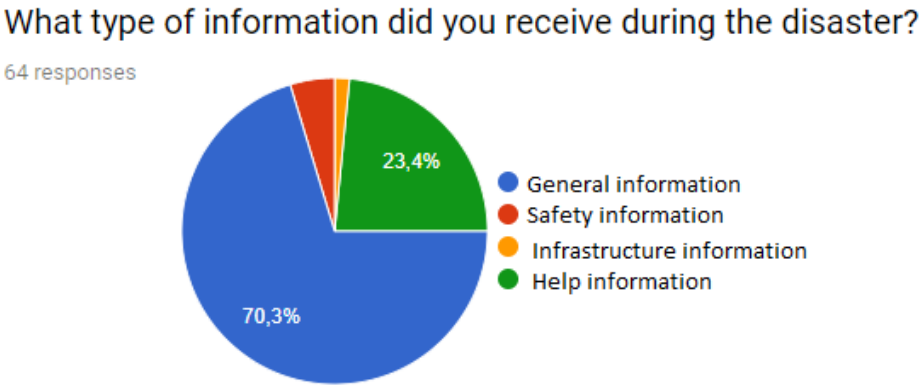

Fig. 7. The type of information obtained during natural disasters occurs

Information obtained through social media from the earthquake and tsunami that occurred in Central Sulawesi was in the form of general information, such as when the earthquake occurred, the number of victims, and which areas were affected. Safety information, such as how many people are dead, and information on infrastructure and assistance. Most of the information sought by the community from the earthquake and tsunami that occurred in Central Sulawesi was general information.

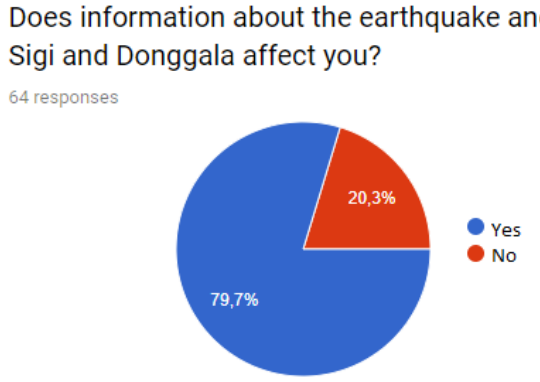

Fig. 8. Information affects society.

The earthquake and tsunami disasters that occurred in Central Sulawesi influenced the community; as shown in the Fig. 8, 79.7% of people felt the impact of the event, even though they were not affected.

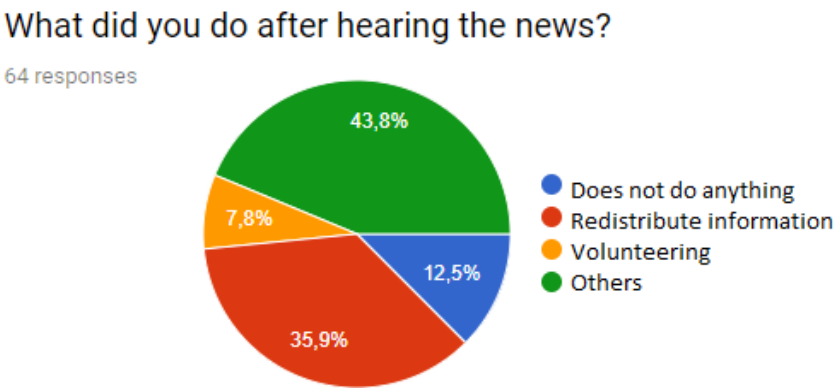

Fig. 9. Activities carried out by the community after knowing the information

After knowing the information about the earthquake and tsunami in Central Sulawesi, 35.9% of respondents distributed the information obtained, 7% volunteered, while 12.5% did nothing.

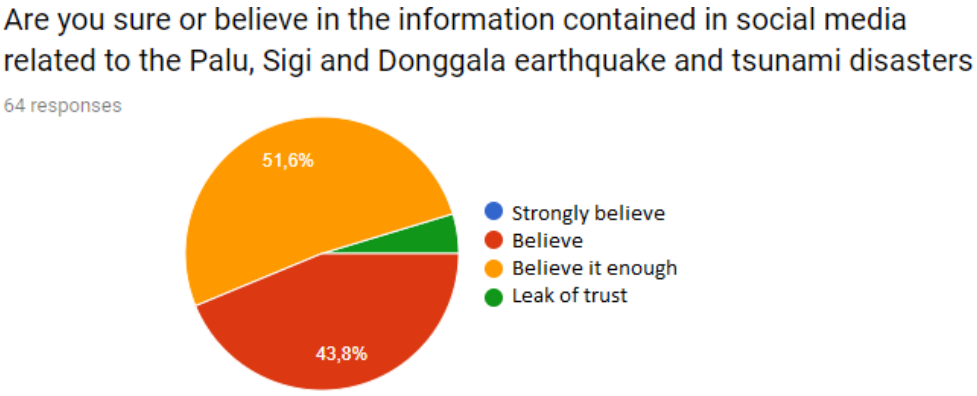

Fig. 10. The level of public trust in information

Dissemination of earthquake and tsunami information in Central Sulawesi through social media, its identity is believed to be true by the community. As shown in Fig. 10 that less than 5% of them do not believe the truth of the information disseminated through social media.

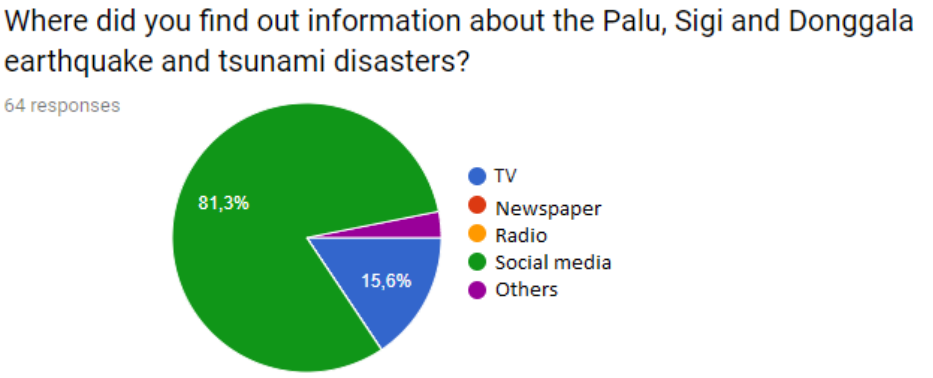

Fig. 11. Media to get information

Information about the Central Sulawesi earthquake and tsunami disaster 81.3% was obtained through social media, 15.6% through TV media, and the remaining through radio and newspapers. This shows that social media has an important role in the dissemination of information on the earthquake and tsunami that occurred in Central Sulawesi.

4. Conclusion

This study aims to examine the effective usage of social media in natural disaster management, especially after the occurrence of tsunamis or earthquakes in Palu, Sigi and Donggala areas in Central Sulawesi. Based on the results of the study, the conclusions from this study are based on the respondents involved in this study. Most of them said that social media can have an impact on those directly affected by the disaster and those who are not directly affected by the disaster. Through social media, the community can also play a role in saving disaster victims by volunteering and sending aid through the foundation for the distribution of natural disaster relief in certain social media groups involving the community. The results of this study expect control of the information so that the purpose of important information can be achieved effectively and efficiently. Because this control system focuses on achieving disaster news objectives, this type of control must allow the results to be measured and compared to standards so that the willingness of news about the disaster and the condition of the victim does not experience deception.

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