

# How Can Indonesia Government Handle the Natural Disaster during COVID-19 Pandemic: Analysis of Twitter Account

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## ABSTRACT

This study aims to determine how the National Board for Disaster Management and the National Search and Rescue Agency handle natural disasters during the COVID-19 pandemic through social media Twitter. This study uses NVIVO 12 plus for analyzing data using chart, cluster, and word frequency analysis. Sources of the data used in this study came from the Twitter accounts of the National Board for Disaster Management and the National Search and Rescue Agency. The social media Twitter was chosen because both state institutions are responsible for handling natural disasters in Indonesia. The time for data collection in this study started from January 2020 to December 2020. Because at that time, the number of natural disasters in Indonesia is high, moreover the COVID-19 pandemic in Indonesia disrupts natural disaster management in 2020. The findings in this study are that the National Board for Disaster Management plays a dominant role in handling natural disasters, implementing health protocols, and information about natural disaster incidents. Meanwhile, the National Search and Rescue Agency plays a dominant role in helping in natural disasters, information about natural disasters, and victims in a natural disaster. The narrative of natural disaster management on the National Board for Disaster Management Twitter accounts and the National Search and Rescue Agency is about COVID-19, carrying out institutional duties and functions, and using Twitter to inform natural disasters. Judging from its intensity on Twitter, the National Board for Disaster Management is more active than the National Search and Rescue Agency in 2020.

**Keywords:** Handle, Natural Disaster, National Board for Disaster Management, National Search and Rescue Agency, Social Media Twitter.

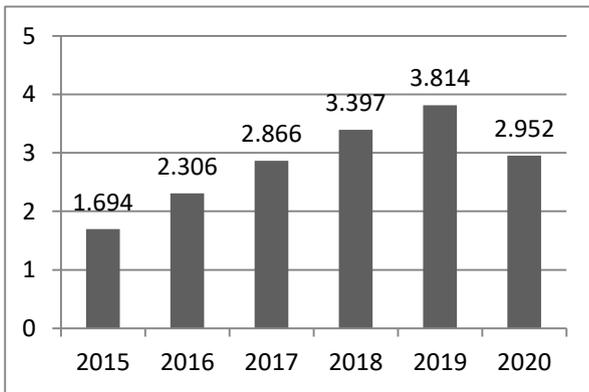
## 1. INTRODUCTION

Indonesia has institutions responsible for handling natural disasters, namely the National Board for Disaster Management and the National Search and Rescue Agency [1]. However, the difference is that the National Board for Disaster Management is assigned with providing guidance and direction and delivering information related to

disaster management such as disaster mitigation, disaster emergency response, rehabilitation, and reconstruction in a fair and equal manner. Meanwhile, the National Search and Rescue Agency is assigned with carrying out rescue, evacuation when a disaster occurs and searching for victims if there are any missing victims in a disaster[2]. Therefore, this study aims to determine how the National Board for Disaster Management and the

National Search and Rescue Agency handle natural disasters during the COVID-19 pandemic through social media Twitter.

Natural disasters in Indonesia are very high, causing extensive damage and casualties and moderate-intensity. Increasing environmental damage due to the increased exploitation of nature has triggered an increased risk of natural disasters [3]. Data for the last five years compiled by the National Board for Disaster Management Agency shows that the natural disasters in Indonesia are very high. Figure 1 helps to show the total natural disasters that occurred in Indonesia from 2015-2020.



**Figure 1. Indonesia Natural Disaster 2015-2020**

Figure 1 shows that the total incident of natural disasters in Indonesia in 2015 is 1,694. The following year, 2016, increased to 2,306 incidents. In 2017 the number of disasters increased again by 2,866. In 2018 a total number of 2,297 incidents occurred, making a significant increase in 2019 as many as 3,814 and in 2020 slightly decreased by 2,951. This shows that the number of incidents of natural disasters in Indonesia from 2015 to 2020 is very high. Moreover, handling natural disasters in 2020 will be challenging because the COVID-19 pandemic accompanies it. Handling natural disasters in the current epidemic era has made the challenges multiply. Handling disasters requires time, effort, and costs far greater during the COVID-19 pandemic condition.

The significance of the research is that during the COVID-19 pandemic, disaster management in Indonesia must continue to operate. The National Board for Disaster Management Agency and the National Search and Rescue Agency can use social media Twitter features to communicate and handle natural disasters in Indonesia. Over the last decade, social media has grown in importance as a tool for gathering and disseminating information [4]. Social

media Twitter is an appealing platform for governments to interact with citizens due to its inherent features and extensive widespread use for interaction with citizens [5]. Research on natural disasters has been carried out from various perspectives. Economic growth is influenced by disasters but not necessarily detrimental, and the consequences vary depending on the type of disaster and the economic field. Natural disasters have a more significant impact on developing countries rather than developed countries [6]. Massive natural disasters have adverse effects on economic growth both in the short and long term [7]. Other studies have looked at the impact of natural disasters on children. The number of children affected by natural disasters each year is alarmingly high and can be expected to rise as climate change continues [8]. Natural disasters such as heatwaves, floods, drought, and forest fires pose a considerable risk to children, impoverished families, and developing countries [9].

Natural disasters cause significant population displacement and intensify synergic risk factors (changes in the climate, human conditions, and susceptibility to established pathogens), infectious disease outbreaks may occur [10]. Natural disasters have long been a part of human culture, causing spikes in mortality and morbidity [11]. Natural disasters have posed significant challenges to society's long-term sustainability. As a result, emergency decision management for natural disasters becomes increasingly prominent in enhancing disaster response capability [12]. The need for data in natural disaster management is a challenge for database management [13].

Several previous studies have described natural disasters from their impact on the country's economy, children, the risk of spreading disease, and disaster management. Therefore, this study's novelty focuses on using Twitter social media by state institutions to handle natural disasters. This research will answer how the National Board for Disaster Management and the National Search and Rescue Agency handle natural disasters during the COVID-19 pandemic through social media Twitter.

## 2. BASIC THEORY

### 2.1 The Use of Social Media in Government

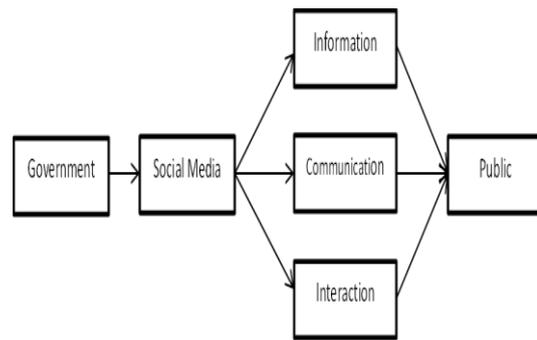
Governments are seizing the opportunity to improve public involvement in political and social affairs by using social media as a significant source of online collaborative participation [14]. The use of the public sector social media accounts links

positively to satisfaction and trustworthiness attitudes [15]. In the government, social media provides a quick and open means of disseminating information tailored to provide services that include public involvement. For the public, social media has become an accountability tool. It is stated that social media is building a contact network between the government and the people through policies on infrastructure restoration and public space growth [16][17].

The government's use of social media is seen as a new wave of technology adoption. The government's involvement in social media sites is never more seen as an option but rather a new norm [18][19]. Social media technology applications in the public sector have formed the fifth wave of information and communications technology adoption in government [20]. The use of social media serves as a communication link between the government and the general public. This government agency's trustworthiness is expected to improve public trust in the government [21][19]. The use of social media increases cooperation between different stakeholders, allows for feedback, and encourages citizen participation. Through fostering "transparency, government responsiveness, and citizen engagement," the creative use of technology contributes to democracy. To increase public engagement, government agencies use social media to communicate with people. Social media serves as a bridge between the government and people is possible in various ways [22][23].

Social media, which includes off-the-shelf networking sites like Facebook, microblogging services like Twitter, and information sharing channels like YouTube, is one medium by which these goals are being followed [24]. Government agencies may use Twitter, Facebook, and Google+ to create new contact networks for communicating with people and stakeholders [25]. The use of social media by government agencies to boost their communication policies' effectiveness is fraught with difficulties. The brevity of messages is one limitation; Twitter, for example, restricts messages to just 140 characters [26].

The Theoretical Framework in figure 2 explains that the government uses social media to provide information, communicate and interact with the public.



**Figure 2. Theoretical Framework use social media in Government**

**2.2 Natural Disaster**

A natural disaster is a natural process that causes loss of life, property and disturbs the order of life [27]. A natural disaster is a natural event that significantly impacts the human population [28]. As time goes by, with increasing human needs, human dependence on the existing natural potentials becomes the cause of natural damage if not treated wisely. This natural damage has triggered natural disasters that result in material and immaterial losses [29]. Natural disasters have varying macroeconomic effects in different geographical areas, and these variations may be connected to the central government's capacity to produce transfers [30]. Natural disasters also result in reduced economic growth and deterioration of fiscal and external balances [31]. Natural disasters have wreaked havoc in many countries, delaying economic growth in developing nations by years.

Natural disasters have become significant threats to human life and the global economy. As a result, governments and international organizations cooperate to foster global and regional risk management and develop disaster mitigation capabilities [32]. Vulnerability must be countered by raising the social capital of communities in disaster-prone areas through the promotion of education and training, as well as the training of citizens through the growth of participation in simultaneous action. Reducing isolation by relying on the development of networks that facilitate communication and exchange of information among diverse communities with shared concerns about disaster risk management [33]. Lower population concentration in vulnerable (mainly coastal) areas and lower concentration of utilities and other infrastructure in disaster-prone areas should prioritize public policy [34]. Policymakers, especially in developing countries,

should research disaster risk financing tools (such as insurance, micro-insurance, and catastrophic bonds). This will protect people and property and ensure that the Sustainable Development Goals are met [35].

The Theoretical Framework in figure 3 explains that natural disasters impact human life, the country's economy, and damage to public infrastructure.

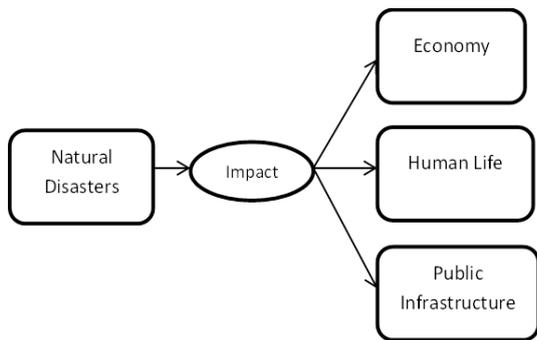


Figure 3. Theoretical Framework Natural Disaster

3. METHODS

This study used NVIVO 12 plus in analyzing data. The features of NVIVO 12 Plus are used to analyze data in the form of chart, cluster, and word frequency analysis. Sources of the data used in this study came from the Twitter social media accounts of the National Board Disaster Management and the National Search and Rescue Agency. The social media Twitter was chosen because both state institutions are responsible for handling natural disasters in Indonesia. The data obtained were then confirmed by the official websites of two institutions and credible mass media such as Kompas.com, liputan6.com, and detiknews.com. The time for data collection in this study started from January 2020 to December 2020. Because at that time, the number of natural disasters in Indonesia was high, moreover the COVID-19 pandemic in Indonesia disrupted natural disaster management in 2020. Data taken from the Twitter's accounts of the National Board for Disaster Management and the National Search and Rescue Agency are in the form of tweets, retweets, followers, following, the roles of the two institutions, narratives, and intensity of natural disaster management on Twitter social media.

The Twitter account for the National Board for Disaster Management has 392.2 thousand followers and follows 288 accounts. Furthermore, the number of Twitter account tweets of the National Disaster Management Agency is 2435, and retweets are 148, as figure 4.

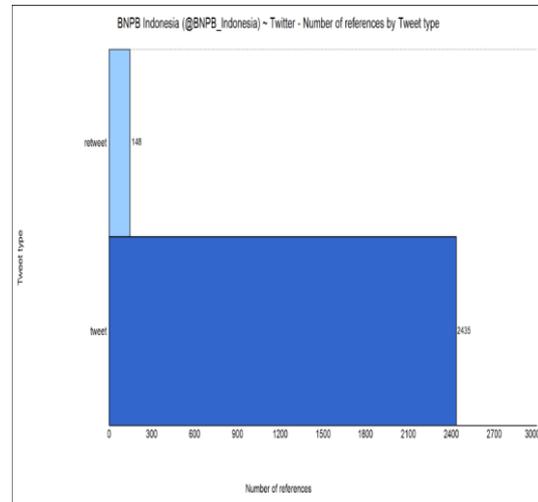


Figure 4. Tweet and retweet the National Board for Disaster Management Twitter accounts

Meanwhile, the National Search and Rescue Agency's Twitter social media account has 485.6 thousand followers and follows 102 accounts. Furthermore, the number of tweets on the National Search and Rescue Agency's social media accounts was 1769, and retweets were 524, as shown in figure 5.

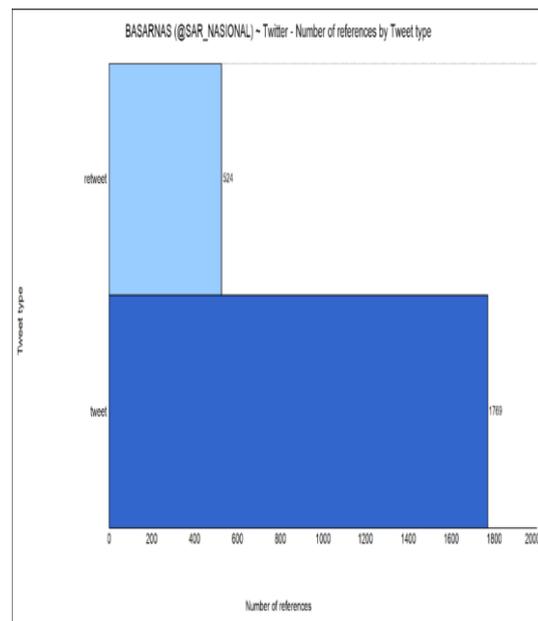


Figure 5. Tweet and retweet the National Search and Rescue Agency Twitter accounts

The number of followers, following, tweets, and retweets of the Twitter social media accounts of the National Board for Disaster Management and the National Search and Rescue Agency show that the Twitter social media account is actively used.

**4. FINDING AND DISCUSSION**

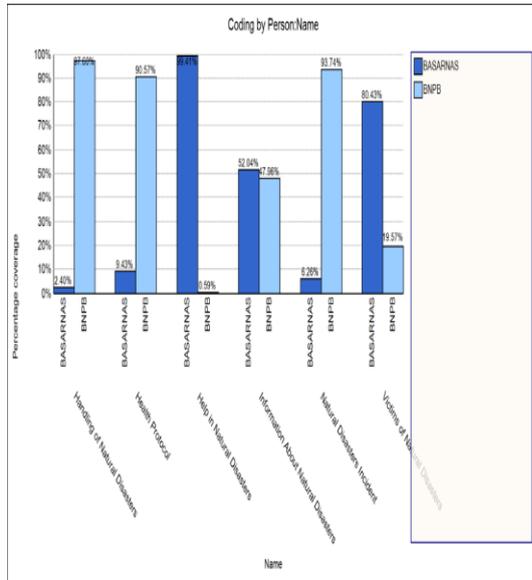
**4.1 The Role of the National Board for Disaster Management and the National Search and Rescue Agency on Twitter**

The National Board for Disaster Management and the National Search and Rescue Agency play a role in the emergency and recovery phase due to natural disasters [36]. The National Board for Disaster Management and the National Search and Rescue Agency use social media Twitter to create a new role in Indonesia's natural disasters. Figure 6 shows the National Board for Disaster Management Agency's role and the National Search and Rescue Agency on Twitter from the chart analysis results. Some of these roles are handling natural disasters, health protocol, helping in natural disasters, information about natural disasters, information about natural disasters incidents, and victims of natural disasters. The chart analysis results in figure 6 help understand how the National Board for Disaster Management and the National Search and Rescue Agency play a role in dealing with natural disasters during the COVID-19 pandemic on Twitter social media.

Disaster Management's role in handling natural disasters is 97.60%, and the National Search and Rescue Agency is only 2.40%. The role related to health protocol, the National Disaster Board for Management amounted to 90.57%, while the National Search and Rescue Agency was only 9.43%. The National Board for Disaster Management appears to have consistently played a role in reminding health protocols in handling natural disasters. Head of the Center for Disaster Data, Information and Communication at the National Disaster Board for Management Raditya Jati reminded the entire joint team to search for victims and refugees in disaster locations to prioritize health protocols. All parties in the disaster area continue to wear masks and maintain their distance, especially in evacuation locations, which must be separated between vulnerable groups and those who are not [37].

The National Search and Rescue Agency appears to have a very consistent role in helping in natural disasters. This is inseparable from the National Search and Rescue Agency's primary task to assist the president in carrying out government affairs in the search and rescue sector. In terms of disaster management, the National Search and Rescue Agency is usually assigned with evacuating or providing natural disaster victims assistance. Besides, they are also assigned to search for victims who have been lost due to natural disasters [1]. The role related to information about natural disasters, the National Board for Disaster Management, was 47.96%, while the National Search and Rescue Agency was 52.04%. Furthermore, the role related to helping in natural disasters, the National Board for Disaster Management of Disaster was only 0.59%, while the National Search and Rescue Agency was 99.41%. This shows that both institutions have consistently played a role in conveying information related to natural disasters.

The National Board for Disaster Management has consistently played a role in communicating natural disasters in Indonesia. The National Board for Disaster Management role was 93.74%, and the National Search and Rescue Agency was only 6.26% in information about natural disaster incidents. Finally, the role of natural disaster victims, the National Board for Disaster Management, was only 19.57%, while the National Search and Rescue Agency was 80.43%. The National Search and Rescue Agency appears to have a very consistent role in natural disasters. This is because the National Search and Rescue Agency focuses on evacuating victims. As the Head National Search and Rescue



**Figure 6. The Role of the National Board for Disaster Management and the National Search and Rescue Agency on Twitter**

Figure 6 shows that the National Board for

Agency Marshal Madya Muhammad Syaugi, National Search and Rescue Agency is looking for, helping, evacuating, and saving lives, as long as there are no casualties natural disasters, National Search and Rescue Agency will not enter there [38].

Some of the National Board for Disaster Management roles and the National Search and Rescue Agency handling natural disasters on Twitter are linked. The results of the cluster analysis in Table 1 help show the relationship between these roles and the strength of these relationships.

**Table 1. The coefficient number of the relationship between the roles of the National Board for Disaster Management and the National Search and Rescue Agency based on Twitter**

Role A	Role B	Pearson correlation coefficient
Health Protocol	Handling of Natural Disasters	0.873442
Information About Natural Disasters	Help in Natural Disasters	0.778824
Victims of Natural Disasters	Information About Natural Disasters	0.476388
Help in Natural Disasters	Health Protocol	0.110449
Help in Natural Disasters	Handling of Natural Disasters	0.098042

Table 1 shows that the role of health protocols with natural disaster management has a high relationship up to 0.873442. This was followed by the role of information about natural disasters with help in a natural disaster of 0.778824. The third position is related to natural disaster victims and information about natural disasters as much as 0476388. In comparison, the weakest relationship is the role of natural disasters and natural disaster handling with only 0.098042.

**4.2 Natural Disaster Management Narrative on Twitter**

The narrative of natural disaster management for the National Board for Disaster Management and the National Search and Rescue Agency on Twitter was obtained from word frequency analysis. Figure 7 shows the narrative of a conversation about natural disaster management on the Twitter social media accounts of the National Board for Disaster Management and the National Search and Rescue Agency during the COVID-19 pandemic. Some of the words that are often discussed are "COVID", "Indonesia", #bersatulawancovid19, "disaster", "handling", "basarnas", "BNPB",

#infobencanaabnpb, "search", "2020", "flood", "earthquake " and others.



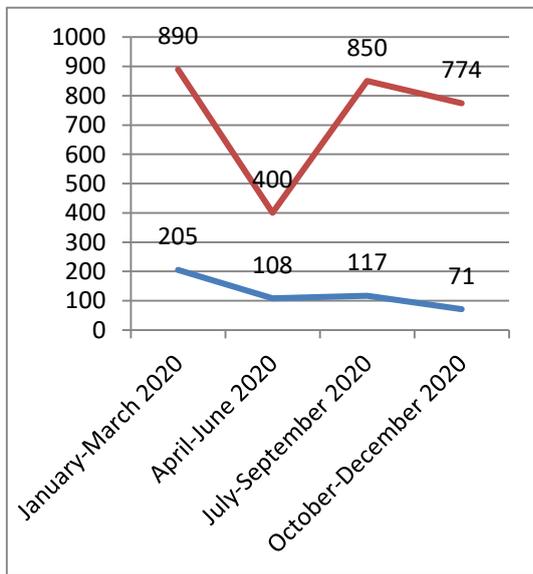
**Figure 7. The narrative of natural disaster management for the National Board for Disaster Management and the National Search and Rescue Agency on Twitter**

Figure 7 shows that the National Board for Disaster Management and the National Search and Rescue Agency pay attention to the COVID-19 pandemic that has hit Indonesia with the words "COVID" and #bersatulawancovid19. The National Board for Disaster Management Agency and the National Search and Rescue Agency talk about "disasters," "handling," "search," and "help" because it is their responsibility to deal with natural disasters in Indonesia. Furthermore, the words "floods" and "earthquakes "are a small part of natural disasters in Indonesia in 2020. The words "basarnas," "BNPB," #infogografibencana, and #infobencanaabnpb are a form of the National Board for Disaster Management, and the National Search Agency Rescue use social media Twitter to deliver information related to natural disasters.

The National Board for Disaster Management recorded 2,925 natural disasters in the country during 2020. This number is from Wednesday, January 1 to today, Tuesday, December 29, 2020. Based on the National Board for Disaster Management data, the dominant disasters are hydrometeorological natural disasters such as floods, flash floods, landslides, tornadoes, drought, forest, and land fires. The impact of these incidents was that 370 people died while 39 people were missing and 536 people were injured [39].

### 4.3 The Intensity of Natural Disaster Management on Twitter

The National Board for Disaster Management responded to handling natural disasters from January to March 2020 so high that it reached 890 times. However, in the period from April to June 2020, the intensity has decreased by 400 times. Then it went back up in the period from July to September 2020, reaching 850 times. Furthermore, in the period from October to December, it was stable at 774 times. Meanwhile, the National Search and Rescue Agency's intensity on social media Twitter is relatively low compared to the National Board for Disaster Management. In early 2020, from January to March, the National Search and Relief Agency responded to the response to natural disasters only 205 times. Then it decreased in the period from April to June 2020 by 108 times. Furthermore, the intensity again increased from July to September 2020 as much as 117 times. At the end of 2020, from October to December, the intensity is low only 71 times. Figure 8 helps to show in full the intensity of natural disaster management during the 2020 COVID-19 pandemic by the National Board For Disaster Management and the National Search and Rescue Agency on Twitter social media accounts.



**Figure 8. The intensity of the National Board for Disaster Management and National Search and Rescue Agency based on Twitter**

Figure 8 shows that the National Board for Disaster Management has the highest intensity from January to March 2020. This is inseparable from the many natural disasters that occurred in early 2020.

Head of the Data Information and Communication Center for the National Board for Disaster Management, Agus, said that there were 203 disaster events during early 2020, dominated by tornadoes as many as 93 events. Then, followed by flooding by 63 events and 45 landslide events. After that, the National Board for Disaster Management noted three forest and land fire cases and two tidal waves and abrasion events since early 2020. The impact of these events was as many as 74 people died, hundreds of others were displaced by the disaster during that period. The National Disaster Management Agency also noted that 83 people were injured and eight people were missing due to natural disasters. The natural disasters also caused many physical damages, including 12,148 houses, 38 offices, and 93 bridges. One hundred seventy-one public facilities were affected, consisting of 118 educational facilities, 42 religious facilities, and 11 health facilities [40][41]. The high incidence of natural disasters in early 2020 resulted in casualties, coupled with the intensity of natural disaster management by the National Search and Rescue Agency on social media Twitter. January to March is the highest intensity of the National Search and Rescue Agency on Twitter social media. The National Search and Rescue Agency helps victims of floods that occurred in Jakarta in January 2020.

### 5. CONCLUSION

This study concludes that the National Board for Disaster Management plays a dominant role in handling natural disasters, implementing health protocols, and information about natural disaster incidents. Meanwhile, the National Search and Rescue Agency has a dominant role concerning help in natural disasters, information about natural disasters, and victims of natural disasters. The National Board for Disaster Management and the National Search and Rescue Agency's two roles in handling natural disasters through the social media Twitter are interrelated. The most vital connectivity is health protocol and handling natural disasters, while the weakest connectivity is between help in natural disasters and the handling of natural disasters. The three narratives of natural disaster management on the Twitter social media accounts of the National Board for Disaster Management and the Search and Rescue Agency are about COVID-19, carrying out the duties and functions of the two institutions, and using Twitter to convey information related to natural disasters. Fourth, the National Board for Disaster Management has a high intensity from January to March 2020 and the National Search and

Rescue Agency. However, in terms of intensity, the National Board for Disaster Management is more active than the National Search and Rescue Agency.

The limitation in this study is the data collection period which is only in 2020. Because in early 2021, Indonesia was also hit by so many natural disasters, even more, the COVID-19 pandemic still has not finished hitting Indonesia. Therefore, the recommendation for further research is that the data collection period includes the year of 2021 natural disasters. The additional time for collecting the data makes the data obtained will be more comprehensive.

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