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The role of social media as a communication facility for hydrometeorological disasters in shallot farming activities

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Abstract

This study aims to determine the role of social media as a means of communication for hydrometeorological disasters in shallot farming activities. The design of this research is descriptive quantitative research. The research was carried out from April to October 2021 by taking the location of shallot farmers in Parangtritis Village, Kretek Subdistrict, Bantul District, Yogyakarta Special Region. The research sample was determined by a quota of 50 respondents. Research data were collected through observation, interviews, and documentation. The results show (1) All respondents stated that ownership of gadgets and internet connection is useful in hydrometeorological disaster information. (2) The role of ownership of social media accounts is as a means of exchanging information on hydrometeorological disasters, namely information related to shallot farming activities (seedlings, soil processing, fertilizers, pest eradication, harvesting, etc.) and information on the threat of hydrometeorological disasters on shallot farming, such as floods and extreme weather. The existence of social media is able to have a positive impact on shallot farmers, especially in adapting to existing weather conditions with strategies to change crop variations, change cropping patterns, change planting periods, and change irrigation systems, thereby helping harvest success.

Keywords: *social media, communication, disaster, hydrometeorology, agriculture*

INTRODUCTION

Indonesia has various potential disasters. One of the potential disasters in Indonesia is a hydrometeorological disaster. Hydrometeorological disasters occur due to global climate change driven by changes in land use and forest destruction in Indonesia. Illegal logging is one of the driving factors causing climate change in Indonesia. Hydrometeorological disasters can be in the form of floods, landslides, extreme weather, tidal floods, and cyclones. Flood is a hydrometeorological disaster that dominates Indonesia from 2010-2020, in addition to landslides and tornadoes (Azizah et al., 2022). Efforts to reduce risk and prevent these disasters need to be carried out (Tingsanchali, 2012).

The fact shows that the international consensus to overcome global warming has been violated by many developed countries, especially the large industrial countries in Europe and America. The human contribution that makes the industry a driving force in the world economy is the main factor in global warming that causes global climate change. Global warming is triggered

by smoke and dust particles as products or industrial waste from developed countries. Another trigger is exhaust gas emissions from various types of transportation used by humans (Shahzad & Riphah, 2012).

Global climate change that causes Hydrometeorological disasters indirectly also affects agricultural activities in various parts of the world. Not separated from the disaster was the impact of shallot farming activities in Parangtritis Village, Kretek Subdistrict, Bantul District, Yogyakarta Special Region. Various Hydrometeorological disasters caused by global climate change have disrupted shallot farming activities in the region. This is because if farmers still rely on prey institutions, farmers will lose money because of the wrong season of rain which can cause flooding to hit the shallot farmland.

Seeing the problems above, hydrometeorological disaster information and disaster communication for shallot farmers are very important for the continuity of shallot farming activities. Information on hydrometeorological disasters that can disrupt the continuity of shallot farming activities can be provided by relevant agencies, such as Meteorology, Climatology and Geophysics Agency or BMKG, Agriculture Service, and the Regional Disaster Management Agency or BPBD. For example, weather information from the BMKG is expected to assist farmers in determining the right planting period for shallot planting activities so that the possibility of crop failure can be minimized.

Information on hydrometeorological disasters from several related agencies can use social media, such as whatsapp, instagram, youtube, facebook, and twitter as a means of communication. Twitter is one of the social media used by BNPB to disseminate information about disasters in the context of disaster mitigation in Indonesia. Utilization from the community side or followers of the @BNPB_Indonesia account is to use twitter as a medium for them to meet their information needs for disasters (Fahriyani, et.al., 2000). The social media used by shallot farmers in Parangtritis Village are whatsapp and facebook. The use of social media is expected to support effective communication between shallot farmers and related agencies. Information on hydrometeorological disasters can be a warning and guide for shallot farmers when dealing with disasters, in this case, they will always be alert at all times with predictions and possibilities that will occur in the presence of a threatening hydrometeorological disaster.

Mosher (1987) states that one of the conditions to facilitate agricultural development is the cooperation of farmer groups so it is necessary to organize farmer groups in the form of farmer groups. The existence of farmer groups is expected that farmers can meet each other and discuss together to plan an

activity. The form of farmer group activities can be reflected in the regular group member meetings and cooperation activities. The existence of a farmer group will help convey information from the relevant agencies about hydrometeorological disasters information to members of the farmer group.

The farmer groups in Parangtritis Village consist of 7 farmer groups with grade levels, namely 2 main groups and 5 middle groups. All farmer groups in each growing season always cultivate shallots. Shallots are one of the leading commodities in Parangtritis Village. Other commodities cultivated are rice and chilies, thus forming a paddy-*palawija-palawija* cropping pattern. In every farming cycle in Parangtritis Village, problems are often encountered, such as pests and diseases on plants, the selling price of plants at harvest time tends to decrease, and the threat of crop failure due to potential hydrometeorological disasters due to flooding from the overflow of the Opak River and extreme weather.

The problems faced by shallot farmers in Parangtritis Village are possible due to a lack of communication and limited sources of information obtained by shallot farmers. The institutional role of farmer groups in facilitating, mediating, and cooperating in obtaining information from relevant agencies about the threat of hydrometeorological disasters that threaten shallot farming activities and how the management strategy should be carried out is also still not optimal. Therefore, it is important to conduct research by studying the role of social media as a means of communication for hydrometeorological disasters in shallot farming activities. With this study, it is hoped that shallot farmers can further optimize the use of existing social media as a basis for meeting the information needs of hydrometeorological disasters in supporting shallot farming activities, starting from pre-planting, to planting, and harvesting.

LITERATURE REVIEW

Hydrometeorological Disaster

Law of the Republic of Indonesia Number 24 of 2007 concerning Disaster Management defines the concept of disaster as an event or series of events that threatens and disrupts people's lives and livelihoods caused by natural, non-natural or human factors, resulting in loss of life, environmental damage, loss of property. and psychological impact. Hydrometeorological disasters are disasters caused by damage to the system in the hydrological cycle, thereby

affecting climate stability and water reserves on the earth's surface (Hermon, 2012). Climate stability occurs due to irregular conditions in rain patterns, inconsistent variations in the rainy and dry seasons, loss of hydrological function of watersheds, and loss of millions of hectares of forest due to illegal logging, resulting in land degradation that continues to flood and landslide disasters. Hydrometeorological disasters in the form of floods and landslides are closely related to extreme weather events in the form high intensity rain, in addition to several other factors such as the physical properties of the soil surface, drainage system, and soil conditions.

The shallot farming area in Parangtritis Village is located north of the sand dunes of Parangtritis Beach and around the Opak River. Extreme weather that often hits the coastal areas of Bantul District causes Parangtritis Village to have the potential for hydrometeorological disasters. The threat of hydrometeorological disasters is very clear from the movement and development of sand dunes, namely the carrying of sand material covering the shallot plants which causes the wilting of the shallots, whereas if there is an overflow of the Opak River it will inundate the shallot farming area. If the shallot farmers are not careful in choosing the planting period and planting period, there will be big losses due to crop failure. According to the *pranata mangsa*, the planting period begins in the eighth period, and will harvest before the ninth period. If it has entered the ninth period, there will be flooding which is the peak of the rainy season. However, the current conditions, and the impact of global climate change have caused a shift in the seasons. This shift in seasons from *pranata mangsa* must be observed by shallot farmers so as not to fail to harvest. Farmers in Imogiri District, Bantul Regency, Yogyakarta Special Region utilize *pranata mangsa* to maintain the sustainability of agricultural land resource management (Khotimah, 2019).

Disaster Information

Various disaster events need information, because in a disaster event the condition of the information will be very critical (Permana, 2015). Therefore, it is very important for the local government and anyone who participates in disaster management activities to identify and know distribution maps, maps of logistics needs, and so on. In addition, disaster information can also be used to manage the social impacts caused.

Media or communication has a strategic location in human life (Akbar,

2021). Disaster information through social media plays a role in the quality of shallot farmers in Parangtritis Village. The quality of the farmers in question is about the absorption of disaster information obtained from social media related to weather information, agricultural information, and information that supports shallot farming activities in Parangtritis Village. The absorption of information obtained from social media provides changes in cropping patterns and planting periods due to obtaining the latest weather information from the relevant agencies so that they can be compared with cropping patterns and planting periods which have been traditionally based on prey institutions. Information about the weather will consider shallot farmers so that there will be no crop failure due to erratic weather.

Disaster Communication

Disaster communication is how to regulate the media as an element of disaster management, because the media plays a major role in reducing disaster risk (Nugroho and Sulistyorini, 2020). Disaster communication is defined as the study of how to convey disaster information as well as designing communication coordination between groups, humanitarian activists and disaster management agencies so that coordination runs optimally. The main purpose of disaster communication is to obtain information, convey communication, and interact with each other.

Disaster communication is important because human communication can interact with each other, both between individuals and groups. Communication within the shallot farmer group in Parangtritis Village is carried out to provide and receive information to have an influence on its members or at least share views for a particular purpose. Communication plays a role in solving problems and becomes one of the considerations in determining the decisions taken, even evaluating one's behavior effectively (Rasyid, 2018). Changes in behavior are expected to create social conditions that are more adaptive to weather conditions that affect shallot farming activities.

Social Media

Current technological developments, with the convergence of media, make it easy for the public to access disaster information that can support disaster management efficiency (Asteria, 2016). Disaster information supports

changes in cropping patterns and planting periods carried out by shallot farmers in Parangtritis Village. Slowly, the change is evidenced by the interest of shallot farmers in agricultural information and weather information they get from social media. The absorption of clear-sourced information such as relevant agencies will determine how shallot farmers react to potential hydrometeorological disasters. Shallot farmers will try to find information about the current situation by utilizing social media through the role of their gadgets and internet connection. A disaster is a big event that cannot be missed because disaster has extraordinary appeal, without having to be engineered (Putra, 2006).

Good use of social media opens up opportunities for solving potential problems of hydrometeorological disasters in Parangtritis Village. For this reason, it is necessary to establish disaster communication and use social media to provide continuous education to shallot farmers. Individuals or groups of shallot farmers who are highly dependent on social media will be influenced by the level of their needs, social conditions, and life goals. For example, if individuals need a lot of information, they will expose the media with a fairly high frequency, so that more information is obtained (Gelgel, 2020). It is possible that shallot farmers in Parangtritis Village who use a variety of alternative social media will have more knowledge, breadth of information, and indepth understanding of potential hydrometeorological disasters and efforts to anticipate them than those who only use one media.

METHODS

The design of this research is descriptive quantitative research. Descriptive research is a research method that seeks to describe and interpret objects as they are, with the main aim of systematically describing the facts and characteristics of the object or subject being studied appropriately (Sukardi, 2008). Quantitative research is an approach that uses numbers, starting from data collection, data interpretation, and the appearance of the data results (Suharsimi, 2013). In this research, a descriptive research was conducted to determine the role of social media as a means of communication for hydrometeorological disasters in shallot farming activities. Quantitative methods were used to find out data on the use of gadgets, internet connections, and social media accounts on shallot farming activities as supporting information on hydrometeorological disasters in the research area. Quantitative data from interviews using questionnaires, then analyzed descriptively by percentage.

The research was carried out from April to October 2021 by taking the research location in Parangtritis Village, Kretek Subdistrict, Bantul District, Yogyakarta Special Region. Parangtritis Village was chosen as the research location because it has the largest shallot planting area in Kretek District, which is 246 ha or 64.2% of the total area in Kretek District (BPS – Statistics of Bantul Regency, 2021). The production of shallots in 2020 is 9,550 kg/year. Kretek District is one of the centers of shallot production in Bantul District. The existence of shallot plants is planted in rotation with rice and chili plants so that the cropping pattern becomes paddy-*palawija-palawija*. The number of farmer groups in Parangtritis Village consists of 7 farmer groups, consisting of 2 main farmer groups and 5 middle farmer groups.

The population of this study were all shallot farmers in Parangtritis Village. The research sample was determined by a quota of 50 respondents. Research data collected in the form of primary data and secondary data. Primary data was collected through observation of shallot farming activities and interviews with respondents, while secondary data was collected through documentation of various sources of information or data sources related to the study conducted, including data collection from relevant agencies, such as BMKG, Agriculture Service, and BPBD Bantul District. The data that has been collected is then processed in simple statistics and analyzed descriptively to describe the results of the study.

RESULTS AND DISCUSSION

Description of Research Area

Parangtritis Village is one of the villages in Kretek Subdistrict, Bantul District, Yogyakarta Special Region. Its area is 11.87 ha or 44.3% of the total area of Kretek District. The distance from Parangtritis Village to the District Capital is 2 km and the distance to the Regency Capital is 16 km. Parangtritis Village consists of 11 Sub Villages and 55 Neighborhood Associations.

The topography of the Parangtritis Village area is mostly plains, only part of it in the eastern part is hills. In the southern part of the area is a coastal plain topographic area. Climatologically, Parangtritis Village has a tropical climate. The land use in the village is 184.6 ha (15.0%) of paddy fields, 425 ha of non-rice fields (34.5%), and 623 ha of non-agricultural land (50.5%) (BPS – Statistics of Bantul Regency, 2021). This condition allows the potential for

hydrometeorological disasters in Parangtritis Village. Therefore the importance of the community in optimizing the role of information technology in the form of social media from the relevant agencies.

Respondent Identity

The 50 shallot farmers in Parangtritis Village who became respondents were in the age range of 35-62 years. 100% of respondents are of productive age. All shallot farmers of productive age indicate that shallot farming activities in Parangtritis Village require workers with strong physical conditions, especially when preparing shallot farming land.

Education of shallot farmers in the research area, 46% graduated from high school, 30% graduated from junior high school, 16% graduated from elementary school, and the remaining 8% graduated from college/academy. The educational conditions of shallot farmers can be said to be adequate because 84% have completed 9 years of basic education so it is possible to have a good mindset to support shallot farming activities in Parangtritis Village. This is because in shallot farming activities, farmers have the potential for hydrometeorological disasters so they need the ability to make decisions regarding changes in cropping patterns and planting periods to minimize crop failure as a result of global climate change.

Shallot farmers in Parangtritis Village also have side jobs considering that shallot farming is vulnerable to climate change. 46% of shallot farmers have a side job as a handyman, 32% as a laborer, 12% as a trader, and the remaining 10% do not have a side job. The dominance of shallot farmers in Parangtritis Village have side jobs (90%), this shows that shallot farmers can still use the remaining time of their work in agriculture to work in the non-agricultural sector. This condition is supported by the desire of shallot farmers to meet the basic needs of their families.

The Role of Social Media as a Communication Facility for Hydrometeorological Disasters in Shallot Farming Activities

a. *Ownership of gadgets and internet connection*

The results showed that of the 50 shallot farmers who became respondents, 42 respondents (84%) had gadgets (smartphones) and the remaining 8 respondents (16%) did not have gadgets. The existence of

shallot farmers who do not have gadgets must have the support of all parties so that they can immediately have gadgets including facilitation in their use to enable them to obtain the best information services.

Of all shallot farmers who own a gadget, 30 respondents (71.4%) have an internet connection and the remaining 12 respondents (28.6%) do not have an internet connection. This condition is understandable because there may be shallot farmers who have gadgets that only function to receive calls and message. This of course also requires the support of all parties so that shallot farmers can immediately have modern gadgets with complete application support. Farmers who have modern gadgets, but do not have an internet connection, they choose to access information via free Wi-Fi provided at the Parangtritis Village office and in several places that provide free Wi-Fi. Based on these conditions, farmer groups have a role in optimizing good communication relations between shallot farmers in Parangtritis Village through ownership of gadgets and internet connections.

The use of gadgets and internet connections is expected to support the ability of shallot farmers in mastering information technology so that they can obtain modern agricultural knowledge and disaster information that has the potential to disrupt agricultural activities carried out. This is in line with the support from the Governor of East Kalimantan, Awang Faroek Ishak, who emphasized that East Kalimantan farmers must be able to master information technology, not only know the hoe, because with the mastery of information technology, farmers can obtain modern agricultural knowledge and the necessary fertilizer needs (www.kaltimprov. go.id).

b. *Benefits of having a gadget and internet connection in hydrometeorological disaster information*

The results showed that all (100%) shallot farmers in Parangtritis Village stated that possession of gadgets and internet connections was useful in hydrometeorological disaster information. The benefits are felt by members of the shallot farmer group in Parangtritis Village, both those who have or do not have gadgets and internet connections. The exchange of disaster information occurs between those who have and do not have gadgets and internet connections. Information exchange can be done at any time, when there is agricultural activity on their land. By word of mouth (WOM), shallot farmers who do not have gadgets and internet connections can obtain disaster information and other agricultural information verbally, and informally from shallot farmers who have gadgets and internet

connections, so that disaster communication is expected to be able to go well.

Shallot farmers in Parangtritis Village who are positively influenced by the information or news disseminated, who previously may not have been aware of matters related to hydrometeorological disasters, are now becoming more aware, although the behavior changes are still gradual. This is in line with Akbar's (2021) research which suggests that the media with all the impacts produced in the cognitive area can affect the surrounding objective reality, so the behavioral changes that are expected to be contained in messages through media communication can take place as expected. This change is expected to create social conditions that are more adaptive to conditions that require new social conditions.

c. *Ownership of social media accounts facebook, twitter, instagram, and whatsapp*

Of the 30 shallot farmers in Parangtritis Village who became respondents, all respondents (100%) had facebook and whatsapp social media accounts, 10 respondents (33.3%) had facebook, twitter, and whatsapp social media accounts, 7 respondents (23, 3%) have facebook, instagram, and whatsapp social media accounts, and 13 respondents (43.4%) have facebook, twitter, instagram, and whatsapp social media accounts. This shows the activity of shallot farmers in Parangtritis Village who have gadgets and internet connections on social media. Ownership of social media accounts illustrates that shallot farmers in the region will more often access various information, especially information on hydrometeorological disasters in their area which can affect shallot farming activities.

From the data above, it is known that information on hydrometeorological disasters from 4 alternative social media accounts, only facebook and whatsapp accounts are the most widely used by shallot farmers in Parangtritis Village. This shows that although there are alternative social media besides Facebook and WhatsApp to find out information on hydrometeorological disasters, respondents directly share the information received on facebook and whatsapp social media without verifying it with other alternative social media. Based on the results of direct interviews with shallot farmers in Parangtritis Village, it can be seen that most shallot farmers do not yet have the ability to filter information on hydrometeorological disasters that cannot be accounted for (hoaxes). Shallot farmers have not verified or confirmed the validity of the disaster information they received. The information they can directly share in the whatsapp group or uploaded

to the shallot farmer facebook group without prior confirmation.

d. *The role of social media account ownership in hydrometeorological disaster information*

Of the total shallot farmer respondents in Parangtritis Village, all (100%) stated that social media accounts play a role as a means of exchanging information on hydrometeorological disasters. Hydrometeorological disaster information can be exchanged between farmers, field extension officers, Agriculture Service, BMKG, BPBD, Non-Governmental Organizations (NGOs), and so on.

Several things were informed in the facebook group as one of the social media accounts owned by all respondents, including information related to shallot farming activities (seedlings, tillage, fertilizers, pest eradication, harvesting, etc.) and information on the threat of hydrometeorological disasters on shallot farming, such as floods and extreme weather. This condition is also supported by information from other social media accounts (twitter, instagram, whatsapp) owned by shallot farmers. The existence of social media is able to have a positive impact on shallot farmers in the research area, especially in adapting to existing weather conditions with strategies to change crop variations, change cropping patterns, change planting periods, and change irrigation systems, so that they can help harvest success.

Based on the statement above, the researcher concludes that social media makes it easier for shallot farmers in the research area to quickly find information related to hydrometeorological disasters information. The existence of social media is very close to shallot farmers so it can affect their lives and make them dependent on the existence of social media to support their agricultural activities. This is in line with the statement of Fahriyani, et.al (2020) who stated that currently people are actively using social media which is the impact of technological developments. Social media makes it easier for humans to communicate with each other and find information. The success of the shallot farmers' harvest in the research area may be an indirect impact of social media. Social media can provide information from various relevant stakeholders engaged in shallot farming.

CONCLUSION

Social media is very useful in hydrometeorological disaster information for shallot farmers in Parangtritis Village, Kretek Subdistrict, Bantul District, Yogyakarta Special Region. The utilization of social media can be optimized through the use of gadgets and internet connections. Social media accounts used as sources of information in the research area include Facebook, Twitter, Instagram, and WhatsApp. All respondents in the research area use facebook and whatsapp as the main sources of information.

The role of social media ownership is as a means of exchanging information, namely information related to shallot farming activities (seeds, soil processing, fertilizer, pest eradication, harvesting, etc.) and information on the threat of hydrometeorological disasters to shallot farming, such as floods and extreme weather. The existence of social media can have a positive impact, especially in adapting to weather conditions with strategies to change plant variations, change cropping patterns, change planting periods, and change irrigation systems. To develop knowledge, it can be studied in more detail the role of social media in dealing with the threat of hydrometeorological disasters, in terms of education, communication, and other related discussions.

Recommendations from the study carried out are considering the importance of the role of social media in human life, it is hoped that social media can build awareness of shallot farmers with matters related to hydrometeorological disasters. The awareness is expected to be able to support changes in the behavior of shallot farmers to create more adaptive conditions with the impact of global climate change.

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