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# Dhamar Wulan and Menak Jinggo War; Mythological Interpretation on The Perception of Disaster Risk at Raung Eruption

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**Abstract.** The response in the face of disaster provided by the community depends on many factors, one of which is the perception they build by the knowledge, experience, or inheritance of its predecessor. In the case of people who have little contact with information technology, perceptions will be strongly influenced by the inheritance of their predecessors. As in dealing with disasters, they will use the knowledge gained from the experience or knowledge of previous generations. This article aims to interpret the public perception of Bondowoso Regency about the risk of volcanic eruption disaster. Using a qualitative approach with 64 subjects representing three districts namely, Tlogosari, Sempol, and Sumber Wringin. Interview techniques are used for data collection which is then analyzed by four-stage interactive analysis model; (1) Data collection, (2) Data reduction, (3) Data Display, and (4) Verification. Residents from the eight villages believe that the flow of lava (lava flow) in the area they live in is the former blood flow from the fight Dhamar Wulan and Menak Jinggo. So there is no disaster threat in their neighborhood. This knowledge is passed on to the next generation. When confidence in the environment mixes with information from authorities, they still believe that the environment in which they are raised will not pose a catastrophic threat. They are just natural routines that have been experienced by previous generations.

## 1. Introduction

Already since the beginning of civilization, several groups of humans lived in the Volcanic region [1]. Fertile land and water resources are the main attraction for the community. Volcanoes that are still active in Indonesia are 129 and 70 of them are categorized as very threatening [2].

The community around the slopes of the Raung Volcano has long lived there. They have knowledge and ways to deal with the environment for their survival (local wisdom) [3], including the volcanic eruption disaster. Their response in the face of events is formed from the experience of knowledge, understanding, and the meaning of each event, phenomenon, hope, and problems that occur around it [4].

Responses when disasters are affected by perceptions of disaster [5] [6]. Individual experiences in dealing with disasters will increase perceptions of disasters and become motivations for actions or actions when disasters occur [7] [8] [9]. Other influential factors are socio-economic and demographic characteristics. Individuals in each social group will receive information and evaluate disasters and prepare themselves to face disasters with different resources.



Based on etymology, the risk in Italian comes from the word *rischio*, *risico*, or Greek *rhizikon*, which means root or stone that is uprooted from the ground. The etymology has no meaning until in the 16th century the word risk was meaningful, namely at the time of the emergence of industrialization in Europe, where the meaning was to take the challenge to get success. Similar to China, the risk is interpreted as two currencies: danger and opportunity.

At present in Indonesia, in various regional languages, the word risk has been accepted as part of everyday life. But it turns out it is not easy to get the equivalent of risk words in regional languages. It is easier to find equivalent words of danger or threat in Bugis, Acehese, Javanese, Sundanese, Minang or Malay languages for example. This is interesting to study further, whether people in various parts of Indonesia are like a shadow of disaster risk reduction scientists and workers who use narrative and risk words as an effort to make social change. Another interesting question is how important is the meaning of risk in the Indonesian context. The risk seems to be a new term for us.

So there are many factors that influence readiness in dealing with disasters such as age, sex. Socio-economic characteristics such as income and education obtained both formally, informal and/or non-formal. On this rational basis, the purpose of this article is to discuss how the influence of the myth of Dhamar Wulan and Menak Jinggo war on people's perception of the threat of Raung Volcano disaster.

## 2. Methods

This research was conducted using a qualitative approach. A qualitative approach is chosen to get a picture of the profound empirical reality of a social phenomenon. The interview technique used is a very important key in this study [10]. The location of the study was conducted in Bondowoso district, East Java Province. The research subjects were 64 people representing three sub-districts namely, Tlogosari, Sempol, and Sumber Wringin. The results of the data collected are then analyzed in four stages, namely; (1) data collection, (2) data reduction, (3) data presentation, and (4) conclusion drawing [11] [12] [13]. Data collected in the form of interviews, direct observation, documentation, and literature review.

The research location is in three Districts of Bondowoso Regency. Namely Sumber Wringin, Sempol, and Tlogosari Districts. The three sub-districts were directly affected by the Raung Volcano eruption primary disaster. Primary disasters that may occur in the eruption of Mount Raung include pyroclastic flows (hot clouds, pyroclastic falls in the form of rocks (incandescent) and ash dry ash in the type of ash dry. from 10km from the crater, here is a map of the research location.



**Figure 1.** Settlements in the KRB I Pakisan Village, Tlogosari District

Some villages in the Disaster Prone Area (in Indonesia is *Kawasan Rawan Bencana* -KRB) I region, namely in Sumber Wringin Subdistrict, are Sepanas Hamlet and Toll Roads in Rejo Agung Village, Darungan Hamlet in Sumber Wringin Village, and South Brick Village in Tegal Jati Village. In Tlogosari Subdistrict, there is the Brambang Hamlet, Pakisan Village. And in Sempol District there is Jampit Hamlet in Jampit Village.

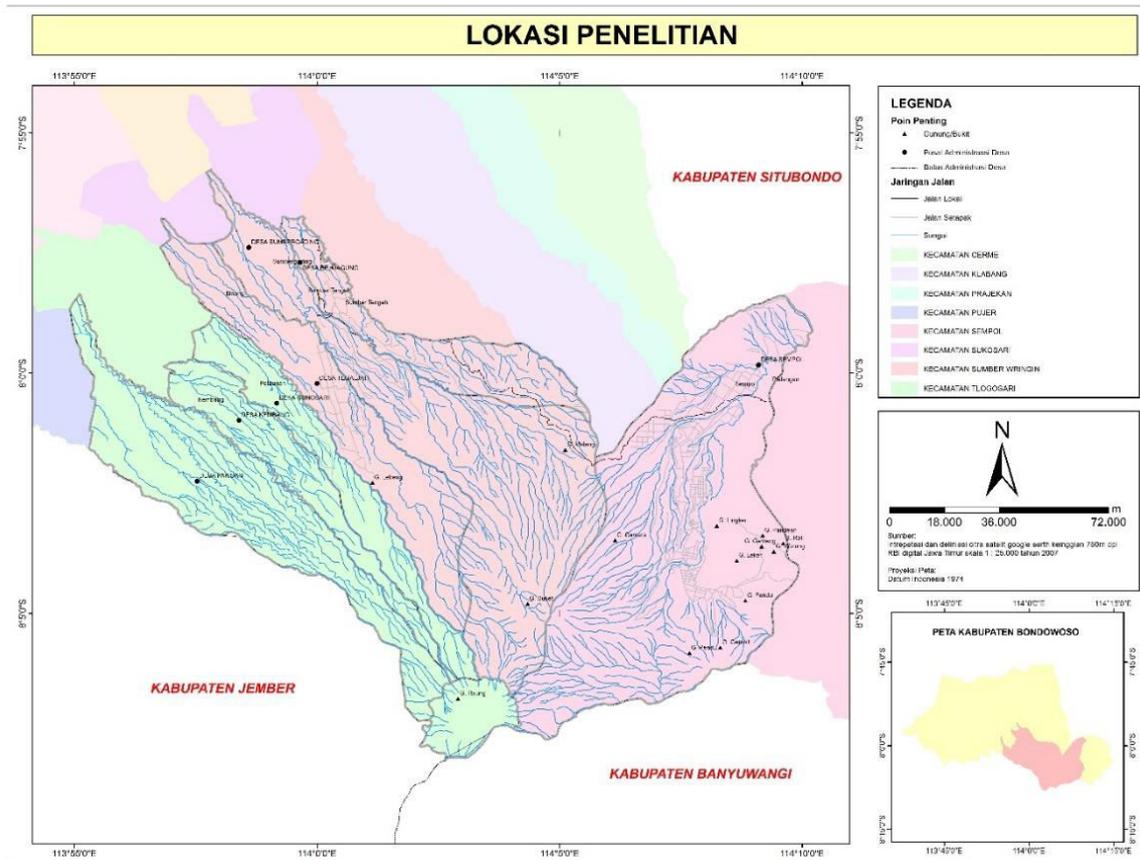


Figure 2. Map of Research Location

Of the three existing sub-districts, Sumber Wringin District has a settlement with the location closest to the crater of the Raung Volcano, which is in Sepanas village. This hamlet is the most severely affected area of eruption in 2015. This area is the Perhutani (Perhutani is mean Business Indonesia Properties or *Badan Usaha Milik Negara* - BUMN, that have the duty and authority to carry out planning, management, exploitation and protection of forests in their working areas) region with the function of the Bondowoso Regency research forest. Most of its citizens are workers in Perhutani with a profit-sharing system. This means they get permission to process and plant forest land with annual crops (coffee) while caring for rubber trees.



Figure 3. Access to the main road in Rejo Agung Village, Sumber Wringin District

Road access to eight villages in the three sub-districts is 40% severely damaged. Many roads with asphalt surfaces have all been stripped off (30%) and the rest are still in the form of land (10%) which inhibits the rate of the vehicle if an evacuation is carried out. For two-wheeled motor vehicles, the average maximum speed that can be reached is 40km /jm and four wheels are around 20-25km/jm.

From the existing location, eight villages from three sub-districts are available in accessibility and quite difficult to evacuate. The BPBD keeps the posts together to facilitate picking up residents in each village. Improvement of accessibility facilities is an urgent matter that needs to be done. In addition to supporting safety aspects, it will also encourage economic growth. But because most of the area is Perhutani, the improvement of these facilities requires gradual permission from several agencies.

### 3. Finding and Discussion

Communities around Mount Raung build knowledge about the threat of eruption from the eruption experience in 1956. Many residents consider that the Raung eruption only occurs inside the crater and does not pose a threat. In Bondowoso, only a few people wanted to evacuate during the eruption in 2015. The reason was that the location they were living at now was owned by Perhutani, so they did not object to leaving it. People under the age of 40 who did not experience an eruption in 1956 only gained knowledge from information provided by the Regional Disaster Service Management (in Indonesia is *Badan Penanggulangan Bencana Daerah* -BPBD). When trying to prepare for evacuation, the previous generation provided information that "Eruptions will not be harmful, we used to erupt in the 1950s. Take it easy!".

In Bondowoso Regency, the community interpreted Mount Raung as a place of life that would not harm them. Some of the closest hamlets belong to Perhutani's work area. They work to manage coffee and rubber plants and have a safer place in the lower area. When there is an appeal to evacuate they do not object because they feel there is nothing to fight for or protect.

During the socialization with residents in Gunosari Village, Tlogosari Subdistrict, Bondowoso, the BPBD provided evidence that their area included the lava flow area. But the community interpreted the lava flow as blood flow due to the battle of Dhamar Wulan and Menak Jinggo. This myth became a belief when mingling with the experience of the preceding generation in the Raung eruption in 1956. They believe they do not need to evacuate because the eruption of Raung is an eruption in the crater and will not come out. The myths circulating in society are theoretically expressed as a subconscious feeling of humans [14]. The unconscious feeling is then felt together by the people who are passed down from generation to generation. In the communication of Javanese people (including the communities around Mount Raung), the myth has always been an important consumption to protect the social environment and the natural environment around them. This is because myth also has a function as a control force rather than human life [15] [16]. The result is the maintenance of the social behavior of the Javanese people both towards fellow humans and the universe. This means that the myths believed by Javanese people give birth to certain mindsets for them [17] including their perception of the eruption of Mount Raung which is associated with the myth of Dhamar Wulan and Menak Jinggo.



**Picture 4.** Lava Flow in Kali Asat, Gunosari Village, Tlogosari District

Knowledge and beliefs in the form of this myth are widely known and get a lot of support, especially in rural areas [18]. Knowledge combined with aspects of experience will build people's perceptions of their environment. This perception is built from traditional sources of information/knowledge. In communities with younger age groups, perception is a combination of knowledge and information from previous generations. This is a modern perception.

Longer life means more experience in dealing with disaster threats from the living environment so as to build perceptions of disasters [5] [6] [7] [8] [9]. This experience is transmitted to the next generation through learning in the event of a disaster. However, if the occurrence of a disaster is not felt to have a significant effect on his life, this new generation will build the perception that disaster is a routine activity in the environment around his residence. This perception is stronger when all their livelihoods depend on the surrounding environment without diversification. They will assume that disasters that occur are part of their lives that have two sides (dualism). That is as a source of livelihood (fertile land) and disasters (damaging livelihoods).

The construction of these two perceptions is getting stronger with actions and information from the government that are too excessive. The local government asks residents in affected areas to evacuate in the area that has been prepared. It should be noted, that residents who are asked to evacuate have the main job as farmers in the garden or breeders. So they feel it is important to protect the assets that are the source of their livelihood. When they feel confident and agree to evacuate, what they get is a false warning sign. Eruption is not as informed by the government. The erosion that occurred was only a burst of ash and was no worse than what had already happened. The damage caused is only temporary in garden plants due to volcanic ash cover.

Residents in Jampit and Rejo Agung Villages experienced a 50% and 80% decline in coffee and rubber production. Coffee plants whose leaves are exposed to ash do not want to flower and produce fruit the following season (one year). While rubber plants experience a production decline of up to 80% because the leaves are covered with ash and dry. The impact is if the plant is forced to remain tapped (the sap is taken) it will die. Therefore farmers do not wiretap until 6 months after the eruption.

The losses caused by the residents of these two villages are not too large. That's because they only manage Perhutani's land with an agreement that 50% of the harvest is owned by the residents and the rest is handed over to Perhutani. Ownership factors greatly influence the response when a disaster occurs. They do not mind being moved at any time because currently they only occupy official homes to look after the gardens. They already have a house in a safer area.

Disturbed sources of livelihood make residents in the two villages have to make decisions to find temporary sources of livelihood. Livestock is assets that are easy to be used as temporary sources of livelihood. But in the event of a disaster, sometimes livestock is one of the variables that makes people reluctant to evacuate. The need to protect livestock mixed with the belief that they live in a safe area builds the perception of residents around active volcanoes that it is difficult to evacuate. Even when in refugee there are some residents who want to enter the danger zone just to see the condition of their livestock.

Consideration of citizens to survive because of more rational reasons. Myths born without logos can be rational when getting a lot of support. These rational reasons ultimately make individuals make decisions as a response to the surrounding environment [19].

Changing the mindset that exists in the community in the face of the threat of catastrophic volcanic eruptions in Bondowoso District needs to study their sources of livelihood. Apart from the aspect of education there needs to be the identification and planning to suppress the negative impacts of this disaster on the character of the community. The aspects of vulnerable livelihoods must be one of the government's attention. The following is the identification of aspects of livelihoods that have vulnerabilities in the event of a disaster.

**Table 1** Identification of Vulnerability Aspects and Recommendations for Local Governments

No	Aspect	Vulnerability	Recommendation
1	Physical	Agricultural land is very vulnerable to damage when there is ash rain	Land restoration after a disaster occurs and giving new seeds after the land is ready for planting
2	Economy	Damaged agricultural land results in economic activity stopping, residents will divert livelihoods in the form of livestock savings. The reasons for protecting livestock also have an impact on the decision to evacuate during a disaster.	The government provides shelter and feed locations for livestock

Perception in disaster risk reduction efforts is an important approach point. Mitigation planners must look at local values in the surrounding community so that mitigation efforts do not become a responsive effort in dealing with disasters. These activities must be part of the community (risk society) by integrating into people's lives so that mitigation becomes an anticipatory activity.

The Risk Society does not produce a community that is able to manage risk, but it is emphasized that this community is able to do so because it has fulfilled certain conditions, including the ideal 'risk communication'. The prerequisite is implied in the definition of risk communication, which is an exchange of information and opinions, as well as building effective dialogue between the various parties involved in reviewing, minimizing and managing risks, together with those (communities) affected by the risk.

However, for the sake of effective risk communication, the community needs to have a critical attitude towards reality, ask questions and question science itself, as a form or characteristic of modernity. Dialogue and democratic processes in discussing risk information must be fulfilled. These prerequisites are clearly not fulfilled if we are still trapped in a false news and information octopus (hoax), just reading the big titles without looking further at the contents of the news, believing it, even participating in disseminating it. This is what literary weakness means. When we do not have the preconditions of a critical attitude as a 'society risk' or a society that is familiar with risk, then we need to look further at the causes. Is the level of literacy or reading power of the community weak, the level of education that is still low, distrust of modern science, or so forth. With risk communication still having problems, it is difficult for us to hope that people can take ideal disaster risk reduction measures as imagined.

In the case that occurred in Raung, the government chose to take on a scare role so that the community was always ready. But this is a bad value for the government if what is informed does not occur. Public trust in the government will be lost so that it will be difficult when a disaster occurs in the future. It is important for the government to consider aspects of myth or local value as one approach that can accommodate risk communication. As happened in the Puailiggoubat newspaper in Mentawai. Three years after the 2004 tsunami, the media still discussed the role of the community in restoring all damaged aspects (Figure 5).

Local values in the form of increasing religiosity will have an impact on reducing the potential for disasters in the future and are also found in many Indonesian people, especially Jawa [20]. The story of the war of Dhamarwulan and Menak Jinggo is a very thick and inherent history in the eastern part of East Java (Banyuwangi, Jember, Bondowoso, and Situbondo). The belief in the value of the cult from the surrounding environment provides a different view in dealing with disasters. They will understand disasters as part of the natural routines around them [21], or usually referred to as the domestication of disasters.

From this fact, the literacy of the community against disasters is not empty at all. It's just that we as academics view that literacy is incompatible with modern literacy so that preventive measures in the form of efforts to frighten become the most rational choice when facing disasters. If examined further the problems of the community are distrust of modern science. With the still problematic risk communication, it is difficult for us to hope that the public can take ideal disaster risk reduction measures as imagined.



**Figure 5.** Puailiggoubat Newspaper December 2007  
Source issuer/puailiggoubat/docs/ok

#### 4. Conclusion

Local myths are public literacy that has been built before modern knowledge exists. Local myths build more religiosity about the value of the environmental cults in which they live. In disaster risk reduction efforts academics sometimes tend to nullify the role of local knowledge with modern knowledge in the form of "scaring" the community with excessive threats about the impact of disasters. This effort is indeed quite effective for preventive actions so that people will stay away from the danger zone. It's just that if the threat delivered does not occur, it will have an impact on how people face disasters in the future. Experience and knowledge of disasters that exist make them not believe in modern knowledge. Therefore, there needs to be a special room for local knowledge for academics in providing understanding to the community regarding disaster risk reduction efforts as an effort to approach a more populist knowledge.

#### References

- [1] Howes, Dale Dominey. 2004. Perceptions on Hazard an Risk Santorini. *Journal of Volcanology and Geothermal Research* 137 (2004). P 285-310.
- [2] Zamroni, M. Imam. 2011. Islam dan Kearifan Lokal dalam Penanggulangan Bencana di Jawa. *Jurnal Penanggulangan Bencana* Vol 2 No 1 Tahun 2011. Hal 1-10
- [3] Mishra, S., and D. Suar. 2007. Do lessons people learn determine disaster cognition and preparedness? *Psychology & Developing Societies* 19:143-159. <http://dx.doi.org/10.1177/097133360701900201>
- [4] Vazquez, Esperanza lopez and Marvan, Maria Lusia. 2012. Volcanic Risk Perception, Locus of Control, Stress and Coping Responses of People Living Near the Popocatepetl Volcano in Mexico. *Journal of Risk Analysis and Crisis Response*, Vol 2 No 1 May 2012. P 3-12
- [5] Sattler, D. N., C. F. Kaiser, and J. B. Hittner. 2000. Disaster preparedness: relationships among prior experience, personal characteristics, and distress. *Journal of Applied Social Psychology* 30:1396-1420. <http://dx.doi.org/10.1111/j.1559-1816.2000.tb02527.x>
- [6] Miceli, R., I. Sotgiu, and M. Settanni. 2008. Disaster preparedness and perception of flood risk: a study in an alpine valley in Italy. *Journal of Environmental Psychology* 28:164-173. <http://dx.doi.org/10.1016/j.jenvp.2007.10.006>

- [7] Russell, L. A., J. D. Goltz, and L. B. Bourque. 1995. Preparedness and hazard mitigation actions before and after two earthquakes. *Environment and Behavior* 27:744-770. <http://dx.doi.org/10.1177/0013916595276002>
- [8] Lindell, M. K., and R. W. Perry. 2000. Household adjustment to earthquake hazard: a review of research. *Environment and Behavior* 32:461-501. <http://dx.doi.org/10.1177/00139160021972621>
- [9] Tekeli-Yesil, S., N. Dedeoglu, M. Tanner, C. Braun Fahrlander, and B. Obrist. 2010. Individual preparedness and mitigation actions for a predicted earthquake in Istanbul. *Disasters* 34:910-930. <http://dx.doi.org/10.1111/j.1467-7717.2010.01175.x>
- [10] Moleong, J., Lexy. 2014, *Metodologi Penelitian Kualitatif*, Bandung: PT. Remaja Rosdakarya.
- [11] Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage publications.
- [12] Fatchan, H. A. (2011). *Metode Penelitian Kualitatif*. Surabaya: Jengala Pustaka Utama.
- [13] Denzin, N. K. (2017). *The research act: A theoretical introduction to sociological methods*. Routledge.
- [14] Jung, C.G., 1998. *Jung on mythology*. Princeton University Press.
- [15] Wilkinson, P. and Philip, N., 2007. *Mythology*. Dorling Kindersley Ltd.
- [16] Audifax. 2005. *Mite Harry Potter: Psikosemiotika dan Misteri Simbol di Balik Kisah Harry Potter*. Yogyakarta: Jalasutra
- [17] Angeline, M., 2015. Mitos dan Budaya. *Humaniora*, 6(2), pp.190-200.
- [18] Dove, Michael R. dan Bambang Hidayana. 2011. The view from the volcano: an appreciation of the work of Piers Blaikie. [www.elsevier.com/locate/geoforum](http://www.elsevier.com/locate/geoforum)
- [19] Ritzer, George and Douglas J. Goodman, 2010, *Teori Sosiologi Klasik Sampai Perkembangan Mutakhir*, Yogyakarta: Kreasi Wacana
- [20] Adisaputri Gianisa, Loic Le De, (2018) "The role of religious beliefs and practices in disaster: The case study of 2009 earthquake in Padang city, Indonesia", *Disaster Prevention and Management*, Vol. 27 Issue: 1, pp.74-86, <https://doi.org/10.1108/DPM-10-2017-0238>
- [21] Bachri S, et al. (2015). The calamity of eruptions, or an eruption of benefits? Mt. Bromo human–volcano system a case study of an open-risk perception. Published by Copernicus Publications on behalf of the European Geosciences Union. *Nat. Hazards Earth Syst. Sci.*, 15, 277–290, 2015