The Local Wisdom of The Tenggerese People to Coexist with Disaster of Mount Bromo

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Abstract. The highest losses from global disasters are concentrated in poor countries. Disaster risk in poor countries is exacerbated by conditions such as weak government, vulnerable people, especially in rural areas, and environmental degradation (ecosystems). The experience of the people who have long lived on the slopes of the mountain, providing community knowledge to learn about nature and adapt to the dangerous threats of Mount Bromo. Religious and customary institutions play an important role during eruption and post-corruption in collaboration with the Probolinggo District government and related institutions. Religious and customary institutions are very trusted by the community, therefore at the time of the eruption of religious and customary institutions became very important. The decision to evacuate or stay in the village will be fully implemented by the community. Religious institutions with customs, although they can read the activities of Mount Bromo with their knowledge and beliefs, also follow the development of volcano science and collaborate many institutions.

Keywords: local wisdom, disaster, tenggerese people

1. Introduction
The highest losses from global disasters are concentrated in poor countries. Worsens disaster risk in poor countries, is a weak government, vulnerable people, especially in rural areas, and environmental degradation (ecosystem) [1]. Disasters usually take the form of disturbances caused by nature (such as mountain eruptions, earthquakes and landslides) that cause damage to community functions [2,3]. This damage is due to human limitations in handling disasters so that the nature of the disaster becomes a danger to human life. Disasters arise when behavioral threats meet vulnerability (human limitations) [4,5]. Disaster management is a systematic process that involves the government and the community in using their strategies and survival capabilities to reduce the impact of disasters [6,7,8]; Peleg, 2018; Kong, et al, 2020).

This research focused on the Tengger community has the capacity to deal with disasters through local knowledge, experience and wisdom that has existed for hundreds of years. Mount Bromo is one of the famous mountains in Indonesia in East Java. Mount Bromo is one of five mountains found in the
Tengger Mountains complex. Mount Bromo is a volcano that has a long history, both in the natural process of its formation and its role in the spiritual life of the people of Tengger who live around. From historical records, the eruption of Mount Bromo was first recorded by humans in 1804 which informed that Mount Bromo was a very active mountain, with a deadline for resting from one eruption with another eruption of only a few months and a maximum of 16 years. The eruption period can last for one day and a maximum of nine months [9]. Actually the mountain area is a distinct advantage for an area. Fertile land to be processed into agricultural land, beautiful natural scenery and cool air are an inseparable part of the mountain region. The high potential of the area that can be developed makes this area attractive to residents. Behind the good potential, the mountain area is a dangerous area for humans to live in, because mountains are like time bombs that can erupt violently at any time.

Mount Bromo is a potential source of danger that threatens the safety of humans around it (Center for Volcanology and Geological Disaster Mitigation (PVMBG), 2011). The 2010-2011 eruption was the longest eruption ever recorded in the history of Mount Bromo. Phreatomagmatic eruption which produces material in the form of dust to fine sand is a characteristic of Mount Bromo [9]. Fine dust and sand material spreads in the direction of the changing winds from north, east, northeast to southeast. Incandescent eruption material flew as far as 1.5-2 km in the desert area. Rain of ash and fine sand from the 2010-2011 Bromo eruption caused several areas on the slopes of the Tengger Caldera to fail to harvest. The main agricultural products such as potatoes, leeks, and cabbage cannot be harvested. Plants wither and eventually die due to volcanic ash covered. From the data held by the East Java BPBD, agricultural losses caused by the eruption of Bromo reached 2,440 hectares with a value of losses reaching Rp 28 billion. The largest loss occurred in Ngadirejo Village, the area of damaged land reached 304 hectares with a total loss of Rp 8.6 billion. Some villages that were also damaged due to the eruption of Mount Bromo jinclude Ngadisari, Wonokitri, Wonoroto, Jetak, Ngadas, Wonokerto, Sambikerep, Sambikerep, Pakel, Kadiasari, Sariwangi, Sukapura, and Ngepung Villages [10].

Disasters are seen from three management typologies namely routine, non-routine and complex [11]. The eruption of Mount Bromo when seen from the typology is in the first type, routine, with low to moderate scale and with local impact (small) only in the villages around Bromo (but if the wind is strong enough it will have wider impact), it can be estimated / measured. The mundane approach to mountain and eruption is carried out by PVMBG and people's experience of seeing natural phenomena. This community experience is often used as a guideline in understanding the activities of Mount Bromo when an eruption occurs it is very difficult to evacuate people to distant areas.

Efforts to optimize the role of the community in disaster risk management, the various potential ones in the community must continue to be explored. Review in the form of research by taking an example of Tengger community life in Ngadirejo Village which is prone to the dangers of Mount Bromo. The review is linked to local wisdom, knowledge, and perceptions of the dangers of the eruption of Mount Bromo. Forms of local wisdom in society can be in the form of; values, norms, ethics, beliefs, customs, customary law and special rules. Local wisdom can be in the form of rules concerning; 1) institutional and social sanctions, 2) provisions on spatial use and estimated seasons for planting, 3) preservation and protection of sensitive areas, and 4) forms of adaptation and mitigation of dwellings to climate, disasters or other threats [7,8,11]. Shifting the paradigm of disaster management from being responsive to preventive, demands a variety of new ways in the mechanism of disaster risk management [12]. Involving the role of the community is an alternative model for disaster management, especially in Asia.

2. Theoretical Framework

Changes in disaster mitigation approaches need to reposition the role of local wisdom in disaster governance [12,13,14]. Local wisdom has an important role in creating disaster resilient communities [6]. Disaster management that has been carried out based on top down policies has made the community vulnerable because they are rarely involved in the process [3,15]. In fact, local people have long knowledge and experience of disasters in their area [16].
Local wisdom is a view of life, knowledge and life strategies in the form of activities carried out by local communities in responding to various problems in meeting their needs, including facing disasters [12]. Local wisdom is a custom and custom that has been traditionally carried out by a group of people from generation to generation which is still maintained by certain customary law communities in certain areas [16,17]. Local wisdom is understood as local ideas that are wise, full of wisdom, of good value, which are embedded and followed by members of the community [19,20,21]. Local wisdom is an idea that arises and develops continuously in a community in the form of customs, rules / norms, culture, language, beliefs, and daily habits. Local wisdom in the success of disaster risk reduction is very potential [22,23,24].

3. Material and Method
This research is qualitative research, to uncover and understand something behind the phenomenon [25,26]. Qualitative research is methods to explore and understand meaning by a number of individuals or groups of people ascribed to social problems [26]. The location of this research focuses on Ngadisari Village, Sukapura District, Probolinggo Regency, East Java Province, Indonesia. The location was chosen as the closest village to Mount Bromo. In addition, all community activities, both agriculture and tourism services, are closely related to the condition of Mount Bromo. The ties between the local community and Mount Bromo are very strong, both spiritual, cultural and economic. Data collection techniques using observation, in-depth interviews, and review of documentation [27]. Primary data obtained from in-depth observations at the research location by doing life-in and following traditional rituals. In-depth inquiries were carried out to several key informants who had been previously selected [28]. In addition, this study also conducted interviews with local communities using snowball sampling. Documentation review is carried out based on PVMBG data, BPBD and reports from local governments.

4. Result and Discussion
4.1 Potential for Mount Bromo Disaster
Mount Bromo is located about 42 km from the center of Probolinggo City, East Java Province, Indonesia. Apart from the beauty of the natural panorama of the mountains and the distinctive local people, good transportation access and accommodation are the reasons why Mount Bromo is visited by many tourists making it one of the favorite destinations in Indonesia. However, as natural tourism, Mount Bromo also holds potential dangers for human activities due to frequent eruptions.

Mount Bromo has a height of 2,329 meters above sea level. Mount Bromo is actually the youngest active volcanic cone after the formation of the Sand Ocean Caldera from the Mount Tengger Complex. Mount Bromo is one of the volcanoes that often experience eruptions from 129 active volcanoes in Indonesia. The eruption of Mount Bromo when seen from the typology from Handmer and Dovers [11] is routine typology with low to moderate scale and local impact only in the villages around Bromo. The time span between one eruption and another erupted from less than one year to 16 years since it was first recorded in 1804.
Mount Bromo’s volcanic activity cannot be separated from its position in the mountainous complex. Ash fall deposits or pyroclastic falls, which are dominated by fine sand, are characteristic of this volcanic complex. Rocks around and within the Ocean Sand Caldera are formed from ash and sand deposits associated with the formation of the Sand Ocean Caldera and the crater of Mount Widodaren. Mount Bromo has an eruption period of 4-6 years. More than 50 eruptions have been recorded since being recorded 215 years ago in 1804, with the last eruption occurring in 2019 (PVMBG). Mount Bromo is a type A volcano which has the characteristic of suddenly causing an eruption accompanied by materials such as gravel and ash. Mount Bromo can cause earthquake tremors with normal amplitudes with amplitudes below 10 mm but can increase to 30 mm. The Center for Volcanology and Geological Disaster Mitigation (PVMBG) has mapped the hazard-prone areas for the eruption of Mount Bromo based on a disaster-prone map (See Figure 1).

Figure 1. Volcanic Hazard map of Bromo Volcano (PVMBG), Scale 1:50,000

a. Hazard Zone I ( ), potentially threatened by ash falls and possibly ajected (glowing) rock fragments. This area covers areas ranging from the caldera embankment of the sand sea to a radius of 6 km centered on the crater of Mount Bromo. Hazard Zone I is 63 km2. Apart from the Bromo-Tengger tourist complex in Cemorolawang, the villages included in Hazard Zone I
are Ngadisari, Jetak, Wonotoro and Wonokerto. If there is an increase in the activity / eruption of Mount Bromo, residents, tourists and tourism managers in this Hazard Zone must increase awareness by paying attention to and obeying orders from the authorities. In circumstances of forcing residents in this Hazard Zone I can be ordered to evacuate by the authorities. For this reason, residents must know and pay attention to the direction / route of self-rescue and the location of evacuation.

b. Hazard Zone II ( ), risk of disasters in this area is higher than Zone I, potentially threatened by ash falls and possibly flows, and ajected (glowing) rock fragments. This area covers the entire base and perch caldera cliffs with an area of 50 km2 and a radius of 2-5.5 km centered on the crater of Mount Bromo. So that the hazard zone for Mount Bromo also includes Mount Batok, Mount Segorowedi, Mount Kursi, and Mount Widodaren. If there is an increase in activity / eruption of Mount Bromo, residents and tourists are prohibited from descending to the bottom of the caldera, let alone approaching Mount Bromo and other volcanoes around it.

4.2 Local Wisdom of the Tengger Community

a. Demographics of Ngadisari Village

The inhabitants of Ngadisari Village are the Tengger Tribe, hereinafter referred to as the Tengger Ngadisari Tribe. If there are some residents who say that they are not descended from the original Tengger Tribe, they are outsiders who live in the Tengger tribe area due to a marriage relationship. According to data belonging to Ngadisari Village, the number of residents of Ngadisari village based on village monograph data until 2017 amounted to 1697 consisting of 511 family cards (KK), 21 Rukun Tetangga (RT), and 3 Rukun residents (RW). The total population of women is 731 and men are 791. The majority of the population who are Hindus are indigenous people of Tengger and a minority of the Muslim population are immigrants or non-native Tengger residents. In terms of education, at first the level of education of the population in Ngadisari Village was still low. Where the majority of the population only graduated from elementary school (SD), but it began to change slowly when village leaders made village government policies requiring residents to study up to high school level.

The type of fertile soil in Ngadisari Village is very supportive for agricultural activities, so that in Ngadisari Village the majority of the population has a livelihood as farmers. The number of people who work as farmers in Ngadisari Village is 916 residents. The large number of residents whose livelihoods are farmers make farming activities a routine and the responsibility of family members ranging from husbands, wives to their children on agricultural land belonging to previous families.

Success in agriculture has made the people of Ngadisari Village prefer to continue or work on family-owned agricultural land instead of attending high school. In addition to their main livelihoods as farmers, residents in this area also work as traders, shop owners, kiosk owners, selling souvenirs, camping rentals, shop owners, hotel service owners, villa / homestay owners, guest house owners, tailors, barbers, carpenters, builders, carpenters, batik craftsmen, civil servants, TNI, POLRI, tour guides, hardtop (jeep) drivers and horse guides. Currently, most of the population in this region also has a lodging business with the types of guest houses, homestays and villas. This relatively easy business opportunity to run is accompanied by an increasing tourism industry and the development of tourism products. Hotels or villas in the Ngadisari Village area are owned by private communities because only the people of Ngadisari Village have land rights in the village.

b. Values, Traditions and Institutions in the Tengger Tribe Society

Tengger tribe people believe in and apply what is called Cattur guru bhakti in their daily life. The concept of community trust perched on Mount Bromo, they divide the pillars of belief in Cattur guru Bhakti into four parts which they apply in daily life and influence their belief in the existence of Mount Bromo, the four pillars of belief are:

1) Guru Rupaka, namely trusting and respecting one's own parents, because for the perch society, Guru Rupaka is taken from the word Ngereka from something that does not exist, because for that service, respect for parents is a must because of their great service
2) *Guru Pengajian* namely teachers who teach at schools or places to gain knowledge in the beliefs of the Tengger community, also uphold teachers because for them teachers have taught many things that they cannot get in their environment, such as reading, writing and so on.

3) *Guru Wisesa* namely belief in the government, is called *guru wisesa* because it is taken from the word “ngawisesa” or to rule, which creates tranquility and peace

4) *Guru Swadhyaya* namely the belief in *Sang Hyang Widhi*, *Sang Hyang Widhi* is the creator of all the contents of the world, so people really respect things related to nature, because for them *Sang Hyang Widhi* also represents the power of nature

*Catur Guru Bhakti* is a concept of trust and public respect for what is considered Guru and trusted from generation to generation, the concept of trust is not only applied in daily life but also has an impact when people are perched on the eruption of Mount Bromo because their belief in *Sang Hyang Widhi* is a representation of Their natural forces consider the eruption to be a blessing given by *Sang Hyang Widhi* through the eruption of Mount Bromo to the Tengger community. Then the concept of the perch community trust in the government or in Guru Wisesa is also influential when the local government wants to evacuate and establish a safe radius distance from the eruption of Mount Bromo because the perch community trusts and respects all decisions made by the local government for them.

The Tengger Ngadisari Village perform several ritual traditions based on their customs and beliefs, namely performing ceremonies *Leliiyet, Pujan, Munggah Sigeran* (*Among-among/ ngamongi* jagung), *Wiwit, Kasada, Mayu (Mahayu)* village, *Mayu Banyu* and *Pujan Mubeng*. Almost all rituals have a strong relationship with the closeness of the community to Mount Bromo. *Kasada Day* which is held every year on the full moon in December or January is also the same. *Kasada day* has a story, starting in the 15th century, starting with a story about a daughter *Roro Anteng* who led the Tengger kingdom with her husband *Joko Seger*. This couple did not have any children, so they prayed and asked the mountain gods to give them a child. From their request they were granted 25 children, then the god ordered the sacrifice of the last child (*Raden Kusuma*) to be thrown into the volcano and if the request was not done there would be a big disaster that befell him. The god's request was carried out, so it has become a tradition to this day by throwing crops and livestock. Tengger community believe in this mountains will not be angry with them. Therefore, the Tengger people gather, pray and perform ritual offerings from their agricultural products while still carrying out the cultural values of their ancestors.

Local wisdom in the Ngadisari Tengger community is also manifested in community institutions. Institutions play a role as a social system that regulates the hierarchical structure of social and community groups, which can be in the form of customary organizations consisting of several customary groups. This is the case with the Tengger Tribe of Ngadisari Village, where there are traditional organizations in charge of managing community life, namely religious leaders and traditional shaman institutions. The Hindu Tengger concept is that there is a grouping between the religious system which is derived from the teachings of divinity based on Hinduism and the traditional system which is derived from the beliefs and traditions passed down from generation to generation from the ancestors of the Tengger Tribe. However, in the implementation stage, the assimilation of Hindu religious teachings with the teachings of the customs / beliefs of the Tengger Tribe is carried out. This is reflected in the fact that apart from carrying out religious activities based on the teachings of Hinduism, the people of the Tengger tribe also obediently carry out various traditional ceremonies. The existence of groupings of religious and customary activities affects the division of tasks and functions of each religious leader and traditional dukun institutions.

Religious leader institutions, are religious institutions that accommodate the chairman and administrators of religious activities in Ngadisari Village. The management structure of Religious Leaders Institutions consists of: 1) *Mangku Gedhe*; 2) *Mangku Gelar*; dan 3) *Mangku Alit*. The area that is sanctified and becomes the area of responsibility of the Mangku is the Dhang Kahyangan Kerti Jaya Buana Temple which is a place of worship for Hindus. The traditional dukun institution, functions as a customary institution that accommodates the chairman and administrators of the custom. The management structure of the traditional dukun institute consists of: 1) *Dukun*
Adat; 2) Legen; 3) Sanggar; and 4) Sepuh. Dukun, Legen, Sanggar and Sepuh are responsible for *padhanyangan* which are customarily sanctified areas. In addition, the role of a traditional shaman is to oversee the implementation of customary rules and customary law. Like other villages in general, the administrative area of Ngadisari Village is headed by a village head, but what distinguishes it from most villages is the dukun / adat elder who plays an important role in leading the customary territory as a customary head.

The Tengger community is divided into two customary areas, namely sabrang kulon (represented by Tosari Village, Tosari District, Pasuruan Regency) and sabrang wetan (represented by Ngadisari, Wanantara, Jetak, Sukapura District, Probolinggo District) consisting of village groups each led by a customary chief. Thus, the boundaries of the work area of the traditional dukun are the customary areas and communities in the village where they serve as traditional shaman. In each district there is a regional dukun coordinator who is in charge of coordinating traditional shaman in their area. The traditional shaman who is in each village area of the Tengger Tribe community is generally respected and highly trusted because of his very influential role in the life of the Tengger Tribe community. Structurally, the traditional shaman in the life of the Tengger Tribe is classified as a respected person who becomes a role model for the community and is more respected than the village apparatus. As a customary head, the traditional dukun has both a spiritual and social function. The spiritual function of the traditional shaman is to lead traditional ceremonies. Meanwhile, its social function is to act as a mediator between society and affairs related to government. In addition, traditional healers also have certain powers in making decisions, rules, sanctions or social fines for violators of customary laws and regulations. For example, the dukun's authority in decision-making is that when a disaster occurs, the dukun has the right to determine when the community should evacuate or remain in the village.

c. Village Layout

The concept of space based on customary territory and administrative territory can be explained through two aspects, namely territorial boundaries based on physical markers and non-physical markers. Administrative boundaries based on physical markers can be clearly stated, for example roads and rivers. Likewise with physical markers on the boundaries of customary territories in the form of locations or buildings that are ritualistic such as temples, padhanyangan (dhanyang), and tombs with the orientation of Mount Bromo which function as the center of ritual activities (pancer). Non-physical markers at the boundaries of customary territories can be observed from the behavior settings of the community, for example still following beliefs, laws, customary rules, language, the nature and attitude of life of the Tengger Tribe. In connection with this, Pangarsa, Pamungkas and Subekti (1992) reveal that space in the Tengger architectural tradition can be explained through the concept of space boundaries, at the macro-spatial scale (area, village and environment) to the micro space scale (residence). On a regional scale, there are two conceptions of space that occur; customary territory and administrative area. The boundaries of customary territories are not as strict as the administrative areas of the village, and these two boundaries do not always coincide. The Tengger Ngare conception, which passes through the mountainous area of the local dialect as well as the work area of the dukun, is an indication of the boundaries of customary territories.

1) Settlement spatial orientation

Identifying the value of local wisdom in settlements can be seen from certain customary rules / regulations governing the orientation of the placement of the elements that form the settlement. The concept of the direction that has developed and has become a hereditary belief in the Tengger tribe has a philosophical meaning and is symbolized by certain color elements. The meaning contained in the concept of this direction is then interpreted in the *Pujan Mubeng* (*Nrundhung*) ritual which aims to ask for the safety of the village and to clean the village from disturbances and disasters. The form of application of the philosophical meaning contained in the concept of this direction based on the customs and beliefs of the Tengger tribe is in the form of various color offerings (red, white, yellow, black) which have a philosophical meaning symbolizing the four corners of the village.
Ngadisari Village has the application of a customary rule which is the basis for the concept of direction in laying the elements that form the settlement, including: 1) Tombs consist of sacred graves and ordinary tombs. The provision for laying sacred graves is to the north of the village and far from the location of residential areas. The belief that is believed by the Tengger tribe regarding the laying of tombs is that it is preferably outside the residential area and placed in the north. From the past until now the location of the sacred grave has remained in the same place with the area of land that cannot be increased or decreased. Until whenever the sacred tomb must remain in that place with a fixed area; 2) The temple as a place of worship is placed in a sacred place in the middle of the settlement, which is the place where there are the most pamujan studios in the vicinity. The location of the Dhang Kahyangan Kerti Jaya Buana Temple in Ngadisari Village is in the Northeast of the residential area. The philosophical meaning contained in the provision of laying the temple to the East is that it faces the sun. As a sacred place, the temple is placed at the highest contour of the land; 3) Padhanyangan (dhanyang) is a sacred place for the Tengger Tribe of Ngadisari Village. Padhanyangan (dhanyang) is located in the south of the village and is in one orientation with the sacred tomb (towards Mount Bromo); 4) Residential buildings (micro) are divided into several rooms, namely the pamujan (place of worship), patamon (living room), paturon (bedroom), pagenen (kitchen), pedaringan (storage room), pakiwan (bathroom), and pekayon (a place to store wood). The terms of the placement of each room are; a) Sanggar pamujan is placed in front of the house, must face East or South, must not face West and North, b) the patamon is placed at the front of the house, c) the paturon must be to the right of the direction of the pelawangan (door), d) the pagenen and pedaringan are placed in behind the patamon and it can be combined, e) the placement of clerks must be in the back of the house, f) pekayon is an additional space, placed at the back of the house. In addition there is a customary provision which states that children who are married are not allowed to build a house to the right of the house his parents; 5) The fields/moor used for agriculture are located in the South, North and East of the village; and 6) Mount Bromo, which is located in the south, is believed to be the axis (pancer) of spiritual activity for the entire Tengger tribe. There is a sacred axis that leads to Mount Bromo (South) which connects between the sacred tomb and the padhanyangan (dhanyang).

Regarding the concept of Mount Bromo, which is located in the South as the axis of spiritual activity for the entire Tengger tribe, it has been stated by Hefner (1985) that in Tengger, the presumption of a Southern orientation was followed on the basis of a belief which states that the South is identified as the throne of Bromo or Dewa. Brahma. This can be seen not only at the position of the burial, praying, chanting facing south, or in the orientation of the door (the main door or the shrine), but also in the orientation of the holy places. With Mount Bromo as the spiritual center/axis, it means that people always pay attention to Mount Bromo at all times in order to anticipate all possibilities (mitigation)

2) Land tenure and ownership system
The life attitudes of the Tengger Tribe that are important are the tenure system (not many risks), ojo jowal-jawil (do not like to disturb others), work hard and maintain their own land from generation to generation [29]. As in other Tengger Tribe communities, the land tenure and ownership system is regulated by customary rules which state the prohibition or prohibition against selling land outside the Tengger Tribe community. Whatever the reason, the sale of inherited land or land can only be carried out among the Tenggerese people, usually the sale of inherited land or land is prioritized to close relatives. Land owned by the Tengger tribe in Ngadisari Village is generally obtained from the legacy of their parents. The inherited land distribution system has also been maintained since now with the provision of equal distribution between boys and girls. With customary regulations like this, land management will never change and the community will be at risk of carrying out dangerous activities.

3) Adaptation of residence to climate
The application of the value of local wisdom is the adaptation of a place to live to the climate. The construction of the traditional house of the Tengger Tribe in Ngadisari Village has the ability to adapt to the local climate. The existing condition of the appearance of the traditional house building of the
The Tengger Tribe in Ngadisari Village is as follows: 1) Roof, in the form of a pyramid resembling an upright triangular pyramid with a slope of ± 45 °, made of zinc; 2) Wall, in the form of a wall or half wall, the wall is made of brick while what is meant by half wall is a combination of wall and wooden planks; 3) Doors, made of wood; and 4) Windows, made of wood and glass frames.

The characteristics of the adaptation form of the traditional house of the Tengger Tribe in Ngadisari Village to the local climate can be explained based on the functions of several components contained in the construction of residential buildings and the surrounding environment. The climatic conditions in Ngadisari Village include tropical climates with average daily temperatures between 16 °C -23 °C. Changes in the use of roofing materials in the traditional houses of the Tengger Tribe in Ngadisari Village are caused by adaptation factors to the local climate. Around the 1950's the roof used zinc, but then in the 1970's it was replaced by tile. However, it turns out that the house whose roof uses tile causes the temperature inside the house to get colder. Therefore, since the 1980s, the roof of the traditional house of the Tengger Tribe in Ngadisari Village has been replaced again by using zinc which is more suitable if applied to cold climates such as in Ngadisari Village. From the changes in the use of materials for the roof, it can be identified the form of the value of local wisdom, namely through a process of trial and error then the most suitable and adaptive results are obtained if applied. With a triangular upright roof reduces the risk of collapse during volcanic ash rain.

4) Environmental Management
Local wisdom in environmental management can be seen in various economic activities of the community. The use of technology in the management of fields / moor in Ngadisari Village is limited to simple and environmentally friendly agricultural technology. The planting system uses an intercropping system. Because the land contours are quite steep, to avoid landslides and erosion, a terracing system is created by making plots of land called beds. Strong rooted plants, for example, cypresses, are planted in the fields of Ngadisari Village to prevent landslides and erosion, apart from having strong roots, the wood can also be used as building materials. The type of fertilizer used prioritizes the use of manure / compost which according to the Tengger Tribe of Ngadisari Village is environmentally friendly and does not damage the texture and soil fertility.

The farms cultivated in Ngadisari Village are cattle and pig farms. The form of application of local wisdom of the Ngadisari Village Tengger tribe community in the livestock raising system, namely by placing cages that are far from residential areas. The placement of the cattle sheds far from the settlement is a form of environmental wise action. Apart from this, the people of the Tengger Tribe in Ngadisari Village also use livestock manure to make manure which is able to fertilize without damaging the soil texture but is also environmentally friendly.

The value of local wisdom in the Tengger tribe of Ngadisari Village regarding the forest management and protection system is to classify the forest and use it. The Tengger tribe of Ngadisari Village has a high awareness in managing the forest. The proof of the concern of the Tengger tribe of Ngadisari Village in participating in maintaining the forest is by not cutting the forest carelessly. This attitude in forest management and protection is based on the slogan that is adhered to, which reads "cut one plant two" which means that if you cut one tree, you must plant at least two trees of the same type. This water resources management activity is also one of the social activities which is a weekly activity for the Tengger Tribe of Ngadisari Village, namely working together to clean public water reservoirs.

4.3 Reflection on local wisdom in disaster mitigation
The people of Ngadirejo Village have been living on the slopes of Mount Bromo eruptions often have an impact, but the people of Ngadirejo Village still inhabit the slopes of Mount Tengger. Mount Bormo, which is one of the threats living on the slopes of Mount Tengger, is considered a source of life by the community. The community knows that Ngadirejo Village is the "route" through which the eruption material passes every time Mount Bromo erupts. However, it is considered a blessing in itself. Eruption material such as ash is considered as fertilizer for agriculture. Agricultural yields usually increase after an eruption.
The way people read nature’s signs also affects their perceptions [30,31]. Natural signs such as abundant yields are a sign for them that Mount Bromo will erupt again. There are signs that are around the environment, people use it as a danger alarm, it is believed by the community even though it cannot be studied from a scientific perspective [31,32]. Eruption materials such as ash and sand are not considered a hazard by the community compared to the hot cloud eruption material released by Mount Merapi. The community can say they are lucky, even though the agricultural land was totally damaged by the eruption of Mount Bromo.

The local government has prepared evacuation routes and evacuation tents in collaboration with community institutions, so that when Mount Bromo erupts, it is easy for people to be directed to save themselves. The government cannot force because of the belief in the community that Mount Bromo will not cause casualties. Steps taken by the government were monitoring the situation, alerting TNI and Polri officers at the scene of the incident. Transportation is provided whenever an evacuation must be carried out. Coordinate with PVMBG to find out the latest status during the eruption of Mount Bromo. The village head must report the condition of his citizens. Probolinggo's BPBD priority is saving human lives.

Perceptions of hazards are built by the knowledge of a person / community about these hazards [33]. The people of Ngadirejo village who have lived on the slopes of Mount Tengger for hundreds of years have their own view of Mount Bromo. Mount Bromo is considered the center of cosmology, their beliefs, their mother, and their brothers who inhabit the mountain. Perceptions formed in society are influenced by a strong cultural sector and have been passed down from generation to generation [33]. The Tengger community no longer felt that Mount Bromo was dangerous, so no response was given when Mount Bromo erupted. This is a form of public agreement with nature that people accept the risk of living in a mountain area by considering threats as a blessing.

5. Conclusion
The experience of the people who have lived on the slopes of the mountain for a long time provides the community with knowledge to learn about nature and adapt to the dangers of Mount Bromo. Traditional ceremonies that are often carried out can maintain the togetherness and mutual cooperation of the Tengger community. The local wisdom of the Tengger community in a disaster is as follows:

a) The community places Bromo as the axis and all face the mountain, indicating that the community is always monitoring mountain activities which can erupt at any time.
b) Customary institutions are highly obeyed and are very open to knowledge of disasters.
c) Togetherness in facing disaster
d) Environmental preservation by the community through customary regulations as a mitigation effort to reduce landslides, pests, famine, and social conflicts

The local values of the Tengger people are transformed into economic life, farming systems, land management, respect for nature and living side by side with Mount Bromo. This has had a very big impact on the Tengger community who live together with volcanoes and efforts to minimize the risk of disasters.

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