

REDUCTION OF THE RISK IMPACT OF EARTHQUAKES BASED ON LOCAL AWARENESS AND ITS SYSTEM OF INITIALITY IN LOMBOK ISLAND, WEST NUSA TENGGARA

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ABSTRACT

This study aims to determine the risk reduction of the impact of an earthquake disaster based on local wisdom on the island of Lombok, West Nusa Tenggara, and to know the inheritance system of local wisdom in reducing the risk of earthquake impacts. The results show that the reduction of the risk of earthquake disasters has several traditions used by the inhabitants of Lombok Island, which still use the old traditions when their ancestors nenk, such as the community has long interpreted natural phenomena symbolically as positive and negative markers in the form of myths, beliefs, fairy tales and in the past. immortalize it in ancient manuscripts, poems, kidung, which eventually becomes local wisdom capable of building a culture of disaster awareness. And the inheritance system of local local wisdom for disaster risk reduction in the midst of global cultural domination of local culture is implemented through a strategy of increasing the role of the family as the spearhead of planting and fostering positive values of local wisdom to the younger generation, increasing the role of culture-based disaster education and local wisdom in institutions. - formal educational institutions, utilizing the implementation of ritual ceremonies related to disasters in the form of events so as to attract public appeal, developing the concept of functional value of multi-functional and earthquake-resistant building infrastructure.

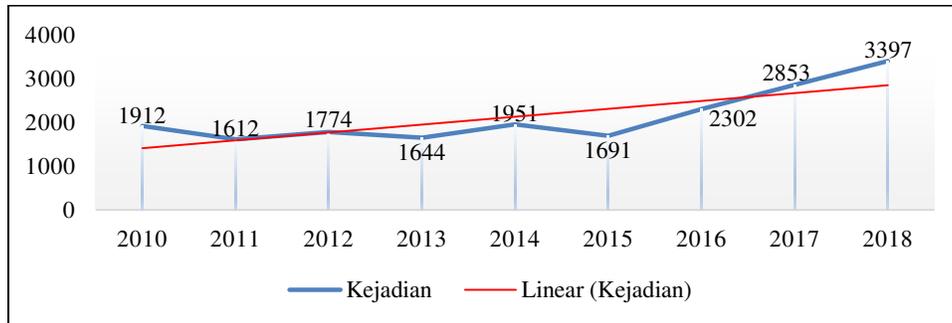
Keywords: Disaster Impact Risk, Local Wisdom, Inheritance System

INTRODUCTION

The results of development that have been pioneered for tens or even hundreds of years can be ruined instantly and can even bury a human civilization in a short time due to the extraordinary energy released by nature (Pramesti, 2018). However, behind this suffering, natural disasters can trigger the emergence of a new life that is better and more resilient.

Geologically, Indonesia is traversed by two world mountain routes, namely the Mediterranean Mountains and the Pacific Circum, so that Indonesia has many active volcanoes and is prone to earthquakes. Mulyadi, et al (2017), said that BNPB stated that 2/3% of Indonesia's territory was prone to disasters. In the last 3 years, the number of natural disasters in Indonesia has increased quite significantly, with 2016 recorded the largest increase of 26.54%, an incidence from the previous year.

Graph of Disaster Incidence (times) in Indonesia from 2010 to 2018



Source: National Disaster Management Agency (2019)

The 2018 Lombok earthquake with a series of earthquakes that began on July 29, 2018, amounting to 6.4 SR as a foreshock location in Sembalun and Sambelia, East Lombok Regency. Following the first earthquake with 7.0 SR as the mainshock on Sunday, August 5, 2018 in Bayan, North Lombok Regency, followed by aftershock of 6.3 SR and 6.9 SR as aftershock on Thursday, August 9 2018. September 24 2018 was 2,133 times. This has led to drastic changes in the economic, social and even spatial conditions. It is estimated that the total value of damage and losses in the impact of the Lombok earthquake is 12.15 trillion, with details of the total damage reaching IDR 10.1 trillion and a total loss of IDR 2 trillion, so that the total funding requirement for rehabilitation reaches IDR 8.6 trillion (Willem, 2018). Koran Tempo dated September 10 2018 detailed the casualties, houses, and public facilities damaged by the Lombok earthquake as follows:

Table 1 List of Victims & Damages from the Impact of the Lombok Earthquake Disaster

No	List	Total
1	Number of Deaths	565 Souls
2	Number of Injured Victims	1,584 people
3	Number of Displaced Victims	445,343 people
4	Heavy Damaged Houses	167,961 Units
5	Public Infrastructure	214 Units
6	School	1,194 Units
7	Medical facility	321 Facilities
8	House of worship	630 Units

No	List	Total
9	Market	46 Market Units
10	Shop and Kiosk	566 Units
11	Hotel	138 Hotels

Source: 1. BNPB report at Nusantara II Building, DPR RI, Senayan, Jakarta (2018)

2. Exposure to the Management of Lombok Earthquake Victims (2018)

The magnitude of the risk of natural disasters is determined by the amount of natural hazards and the level of vulnerability of the community to disasters so that in minimizing natural disasters, these two factors must be considered. The presence of natural disasters is natural and natural phenomena that cannot be prevented by humans but over time, the public generally has the knowledge and wisdom in predicting and mitigating natural disasters in their area. Local knowledge is usually obtained from rich empirical experiences due to interactions with the environment (Ghassani, 2017).

So far, the government's disaster management efforts are still focused on the emergency response process and post-disaster physical rehabilitation. Meanwhile, pre-disaster activities including mitigation have not been effectively carried out. Disaster management often neglects local knowledge. In fact, people who live in disaster-prone areas usually adapt to disasters through local knowledge as an effort to take attitudes during, before, and or after a disaster occurs. Although technological developments have relatively increased in the face of disasters, these technological innovations need to be harmonized with existing local wisdom as a combination of empiricism and rationalism in dealing with disasters.

Knowledge of local wisdom can be used as community disaster preparedness education in accordance with local characteristics and updated according to the latest disaster events that have made an impression on the collective memory of residents. According to Iskandar (2009) in Permana, et al. (2011) stated that now many local knowledge has experienced erosion or loss and is not well documented as a source of knowledge. Local wisdom is very worthy to be explored, reviewed and developed in people's lives and even must be transmitted to the next generations so that it can be effectively utilized as an effective disaster risk reduction effort.

LITERATURE REVIEW

Sunarti, et al (2009) stated that for types of natural disasters that cannot be prevented, the magnitude of the risks and impacts is not only influenced by the magnitude of natural hazards, but also by human resilience in minimizing risks before and after a disaster. Vulnerability is the opposite of resilience, both are like two sides of a coin. The concept of resilience is a broad concept, including the capacity and ability to respond in crisis / conflict / emergency situations (emergency response). Vulnerability is structured by sensitivity, capacity to respond, and exposure.

Disaster management is an effort to plan, organize, supervise, implement and direct all resources if something happens in order to reduce or even eliminate disaster risk. According to

Law 24 of 2007 concerning Disaster Management, disaster management can be grouped into three stages starting from pre, during and post-disaster with the following activities:

Table 2 Disaster Management Stages and Activities

Pre	Moment	Post
Prevention	Emergency response	Recovery
Mitigation	Emergency Assistance	Rehabilitation
Preparedness		Reconstruction
Early Warning		

Source: Law 24 of 2007 concerning Disaster Management

Wilkinson (1970) in Nasution (2005) community is a collection of people who live in a place that builds a socio-cultural configuration and organizes collective activities. MacQueen et al. (2001). The 5 core elements of community: place (locus), sharing, joint action, social ties, & diversity. Lassa, et al (2009). Community is not a unit of homogeneity but has some similarities in experience in dealing with natural phenomena, having & reproducing "local knowledge" in dealing with extreme events through:

1. Own interpretation of disaster risks & risks;
2. Prioritizing disaster risk management;
3. Monitor & evaluate its own performance in disaster risk reduction efforts.

Hariadi, et al., (2019) said that local wisdom is good local ideas, and full of wisdom that is embedded and followed from generation to generation by community members. Local wisdom arises as a response to needs and interpretations of internal & external environmental phenomena (Hobsbawm & Ranger, 1983). Local wisdom becomes social capital for people to answer their life problems, including overcoming the effects of natural disasters. Ife (2014) in Yasib (2017) mentions 6 forms of local wisdom, namely: dimensions of local knowledge, local values, local skills, local resources and dimensions of local group solidarity.

The implementation of local wisdom is often defeated by the increasingly pragmatic attitude of society so that the inheritance system becomes an important factor. Maryani and Yani (2014), there are three steps to revitalizing local wisdom, namely: inventory, reorientation, and reinterpretation. Inventory is intended to collect and select relevant cultural values. Reorientation is the actualization and adaptation of local wisdom so that it is easily accepted by the community. Reinterpretation is reinterpretation of the meaning of local wisdom in order to remain productive. Transitional transmission requires a method so that the process of inheritance is effective from generation to generation. Fortes in Tillar (2002) in Kiptida'iyah (2016), cultural transmission variables include: 1). Elements: cultural values; 2). Process: imitation, identification, and socialization; 3). Methods: instruction, persuasion, stimulation, and punishment.

RESEARCH METHODS

The research design used a qualitative descriptive method to describe local wisdom and its inheritance system related to earthquake risk reduction on the island of Lombok. Primary data collection was carried out by using semi-structured interviews with informants determined by purposive method followed by snowball sampling:

1. Key information: disaster management & culture officials as policy makers & disaster management & cultural programs;
2. Main informants: community leaders, culture, volunteers for the Lombok earthquake disaster;
3. Additional informants: academics & earthquake disaster observers.

Qualitative data analysis techniques with stages of reduction, presentation and drawing conclusions with qualitative data validation through Triangulation, Increasing Persistence, Use of Reference Materials, Member Checks, and peer discussion.

RESEARCH RESULT

The topography of the island of Lombok is dominated by a stratovolcano centered on Mount Rinjani with a height of 3,726m (12,224 ft) as the second highest volcano in Indonesia. Daryono (2018) shows that Lombok Island is a seismicactive area that has the potential to be shaken by earthquakes because it is located between 2 earthquake generators. From the anther strait can be a subduction zone of the Indo-Australian plate that sinks below the island of Lombok, while from the north there is the geological structure of the Flores Back Arc Thrusting.

As many as 95% of the Sasak ethnic group as local residents along with several other ethnicities such as Samawa, Mbojo, Balinese, Javanese, Minangkabau, Bugis, Arabic, Batak and others mingle and live together and are scattered on the island of Lombok with an area of 4,738.70 km² which is divided into 598 villages / Kelurahan and 53 Districts. From 2016 to 2018, the population growth rate on the island of Lombok was 2.4% with a density rate in 2016 of 1,534 people / km² and in 2018 it increased by 1,571 people / km². In carrying out social relations, people on the island of Lombok live with the concept of ajinin which literally means mutual respect, reme, fragile, regen which means like to give, choose a safe, peaceful situation and support tolerance, which adds to the treasure of local wisdom on Lombok Island (Zuhdi, 2018).

July to mid-October 2018 was a period of successive earthquakes rocking Lombok which disrupted the production and consumption process of the economy in Lombok and even NTB. This resulted in a decline in the economic growth rate of the island of Lombok from 6.8% to 2.9%, even in North Lombok Regency, the epicenter of the earthquake, experiencing a negative impact. However, in economic interaction, the Sasak people not only prioritize economic benefits, but also have a social dimension because they adhere to three "mutual", namely, mutual assistance, mutual ownership and hoe / sangkol, as a manifestation of mutual mutual assistance (mutual help)

Build and improve preparedness to face threats as addictive behavior and social capital for the community to reduce the risk of future earthquakes. Local wisdom in the pre-disaster stage can be seen from the process of disaster mitigation, preparedness and early warning.

Local wisdom at the disaster mitigation stage can be seen in the form of:

Settlement and settlement patterns. The victims of the Lombok earthquake, both injuries and lives, were mostly caused by collapsed houses and walls around houses with modern conventional construction. Houses without traditional construction systems experienced massive destruction. A total of 55,924 housing units were severely damaged in West Lombok Regency and Tanjung Subdistrict in North Lombok Regency which were the worst affected sub-districts where 85% or 13,868 residential units were flat on the ground. Based on post-earthquake observations and data from BNPB and BPBD of NTB Province, private traditional houses and those in traditional areas as local wisdom of the community are actually the least affected buildings. Settlement patterns are associated with the arrangement of buildings and dwellings made of natural and light woven materials such as straw, bamboo, wood obtained from the surrounding environment which can reduce the risk of earthquake impacts. Agusinta (2016) said that the Sasak tribe has the uniqueness of regulating settlements according to the characteristics of the landscape and is still oriented towards micro-cosmic beliefs in regulating the layout and direction facing and building component materials.

Myths and beliefs and traditional disaster ceremonies. People have always interpreted natural phenomena symbolically as positive and negative markers in the form of myths, beliefs, fairy tales and enshrined in ancient texts, poems, kidung, which eventually became local wisdom capable of building a culture of disaster awareness. Some Sasak people still believe in things that smell of animism-dynamism, such as the belief in the existence of Dewi Anjani who is considered rijalulgaib as the guardian of the Sasak gumipaer residents of Mount Rinjani and gives warnings in the form of disasters if the nature of Mount Rinjani is damaged and tarnished so that people must pay attention to ethics and rules in maintaining natural balance . Efforts are kept out of harm's way. It is carried out through the implementation of the ritual to reject reinforcements by some community groups on the island of Lombok, for example the Rebo Buntung in Pringgabaya, East Lombok, the Betetolak Ritual in Desa Sapit, Suela District, East Lombok Regency and the Selamat Asuh Ritual in Bayan Village, North Lombok.

Local wisdom in the preparedness stage can be seen from the granary usually owned by 5-6 families as a place for providing food to prevent food insecurity during and after an earthquake occurs. The construction of a typical Sasak granary building is able to maintain the quality of rice or grain. Apart from having jelepeng which serves to prevent the entry of rats, the barn roof made of alang-alang also makes rice last a long time. The granary in the yard layout is located to the right of the house as a tribute to sustenance that must be used for positive purposes and benefit.

Local wisdom in the early warning stage can be seen from warning efforts as soon as possible to attendees or others. Reading natural signs as before the initial earthquake before the big earthquake, there are rumbling sounds from a distance and approaching, strong winds, white

clouds stretching out straight, birds flying in flocks as early warnings. When an earthquake occurs, mentioning with a shout the term earthquake in Lombok is called *lindu* or *lindur* or hitting objects that make a sound that is conveyed to remind people to immediately rescue themselves or others that an earthquake has occurred.

Handling of bad impacts during an earthquake disaster, either saving victims or property as well as meeting the basic needs of the victims. Local wisdom during the disaster phase can be seen from the response and disaster relief processes. Local wisdom at the disaster emergency response stage can be seen from the traditional *berugak* building which is a small hut without 4 or 6 supporting walls. Shortly after the earthquake the *berugak* can function as a place of rest and first aid for earthquake victims, shelters for vulnerable groups, activity centers and places sheltering family members. This type of local wisdom at the emergency relief stage can be seen in the *besiru* culture as a form of social solidarity with the Sasak community in helping activities, working hand in hand, caring for each other or for disaster victims. Even though the earthquake wounds were still felt by some people in Sembalun village, they were still willing and biased to donate their produce to fellow earthquake victims on the island of Lombok, even to the earthquake and tsunami victims in Palu Donggala.

Recovery of community conditions in order to normalize aspects of life and community institutions. Local wisdom in the post-disaster stage can be seen from the disaster recovery and rehabilitation process. Local wisdom at the disaster recovery stage can be seen from the nature, character and personal behavior of the people of the island of Lombok with a noble (honest) culture that puts forward *lomboq* (straight) characteristics and behavior to be willing and able to rise from the downturn caused by the earthquake to return to normal life conditions. In social relations, the Sasak people recognize 4 "each other" as the binders of *silaturrahmi*, namely mutual feelings, mutual *pesilaq*, mutual love and mutual adoration. Local wisdom at the disaster rehabilitation stage can be seen by traditional community games as trauma healing to overcome psychological disturbances due to earthquake disasters such as *Selodor / Type Kuda / Type Bawi, Dengkleng / Ceprak, Cipuci-Puci, Jump Tali, Snake-snake / Snake Dragon, Sungkit / Gatrik / Patok Lele, Jumpring / Sebok Pete, Splitting Plate, Rubber Walls and Bends / Bepelodokan*. Apart from being a game to fill time in post-disaster, this traditional game also has character education values such as honesty, hard work, teamwork, discipline, social spirit and obeying rules.

Local wisdom is constantly changing due to the development of modernization, globalization and needs, where its level of existence depends on the usefulness functionality and the inheritance of local wisdom from the relevant social communities. Local wisdom can be collaborated with modern knowledge and technology so that it is more systematic and practiced as an anticipatory action against disasters.

The times have caused many societies to change the pattern of settlements, residential buildings and barns seen from the use of modern building materials, the development of the number of family members and the view of modern aesthetic values. As a result of the 2018 Lombok earthquake, there has been a long-standing awareness that *bale kayuq* is a residential

concept which is a solution for the people of Lombok who live in earthquake-prone areas because it has good resilience. Slowly but surely the granary is starting to be abandoned along with the development of economic institutions in the form of modern and traditional markets which are increasingly accessible

The rapid science and technology and the influence of modernization that prioritizes reason that is subject to the understanding of individualism and materialism, marginalizes transcendental values and causes the degradation of the value of belief in myths, ritual ceremonies to glorify and maintain the balance of nature so that disaster does not occur or rejects reversals with the current reality of life Public.

People on the island of Lombok who still believe in myths and rituals still tie themselves to the customs they adhere to where there are consequences between residents in the community if they are violated where these customs apply. On the one hand, they are bound by their customs, but they are also faced with the realities of modern civilization so that they try to take an accommodative, open attitude and accept dialogue with culture from outside.

In general, people on the island of Lombok scream *lindur, lindur, lindur* or hit objects that make a sound to remind them that an earthquake has occurred so that other people can quickly carry out their rescue. Now the early warning system is being perfected with the capacity of modern technology which is formally managed by official institutions according to formal authority. The local wisdom of early warning in the community is passed on through the delivery of early signs and directions in case of an earthquake to the younger generation.

During the 2018 Lombok earthquake, this building experienced an expansion of its function to become an effective helper and carried out social activities for disaster emergencies. Over time, as a multi-functional building, the *berugak* has developed in shape and size and the building materials used are adapted to modern building materials, even this building is a symbol of the level of prosperity of a family.

The concept of *besiru* represents the meaning of "meaningful and cross-linked" continues to develop not only in relation to the agricultural process of the Sasak people. From a cultural point of view, the act of *guilt* can be seen from the activities of mutual assistance between communities during the construction of houses, public places (such as mosques, prayer rooms, madrasas, etc.), celebration events, death, and so on. Even during the Lombok earthquake disaster as well as disasters outside the island of Lombok. Various methods were used to revive the spirit of mutual cooperation among earthquake victims in Lombok, NTB. Local wisdom *besiru* shows the fighting power of the community after the earthquake based on a sense of human solidarity. A unique social phenomenon that occurred in the midst of the Lombok earthquake disaster in last August 2018, where people in Sembalun Bumbung Village as victims of the Lombok earthquake sold their produce which was then donated to earthquake-affected communities in East Lombok and North Lombok Districts and even earthquake victims and the tsunami in Palu, Central Sulawesi.

The advantages of traditional games contain many social values because they involve many people directly, honesty and kinship. Along with the times, many traditional games have

lost popularity and are starting to be replaced by modern games that are more interesting and challenging because they are based on digital computerized designs that are biased with online systems but are individualistic and increase consumer behavior. It is not surprising that traditional games will eventually become extinct and replaced by modern games.

Local wisdom that is able to reduce the risk of earthquake disasters must be protected so that it is maintained and developed so that it can become a superior characteristic of the people of Lombok Island through caring for the whole community and identifying and assessing local wisdom;

The inheritance of local wisdom for disaster risk reduction in the midst of global cultural domination of local culture is implemented through a strategy to increase the role of the family as the spearhead of the planting and fostering positive value of local wisdom to the younger generation, increasing the role of culture-based disaster education and local wisdom in educational institutions formal, the use of the implementation of ritual ceremonies related to disasters in the form of events so as to attract public appeal, develop the concept of functional value of multi-functional and earthquake-resistant building infrastructure

Local values still have to be the filter base so that people on the island of Lombok are able to maintain their identity without having to be dragged too deeply into the flow of globalization and modernization.

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