



## Local Wisdom of Nias Island Community Facing the Earthquake and Tsunami

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### Abstract

This article describes the forms of local wisdom of the people of Nias Island in dealing with the natural disasters of the earthquake and tsunami. Nias Island, which is located on the west coast of Sumatra, is one of the islands included in the Eurasian plate fault in the Indian Ocean, which has periodically shaken due to earthquake shocks, which are sometimes accompanied by tsunami waves. To anticipate the impact of the earthquake and tsunami, the Nias community has several of local wisdom by building traditional houses to live in hilly areas that are located far from the seaside.

Keywords: Nias, history, disaster, mitigation.

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### 1.0 Introduction

For almost two decades, on December 26 2004, coastal areas and several islands off the west coast of Sumatra experienced severe shaking due to an earthquake followed by sea water rising towards the mainland, known as a tsunami. This event began with an earthquake measuring 9.3 on the Richter scale which was followed by a tsunami wave that hit the Indian Ocean region. The center is close to the regions of Aceh and North Sumatra, as well as islands off the west coast, including Simeulue Island and Nias Island. The earthquake and tsunami that occurred at the beginning of the third millennium claimed more than 225,000 lives. For Nias Island, natural disasters don't stop there. Three months later, on September 30 2009, a large earthquake measuring 8.7 on the Richter scale rocked the island again. There was extensive damage to buildings and infrastructure across the island, coupled with loss of life (Gruber & Herbig, 2006; Beetham, 2008).

Nias Island, which is located about 120 km (75 miles) to the west of Sumatra Island, in the Indian Ocean (figure 1), has a long history as an island that frequently experiences earthquakes and tsunamis. Various reports since the Dutch colonial era have stated that for centuries this island has often been shaken by earthquakes and sometimes followed by sea water rising to the mainland (Reid, 1995). This of course cannot be separated from the geographical position of Nias Island which is on the Eurasian plate in the Indian Ocean which is very prone to experiencing shocks and tides towards the mainland.

Disasters that occur one after another and continue to recur have shaken all aspects of life, especially for those directly affected by these disasters. How could it not be, without being able to predict or receive early warning, an earthquake followed by a tsunami wave that came suddenly destroyed various infrastructure and claimed lives there. How often does Nias Island experience earthquakes? Two disaster geologists, Rastogi and Jaiswal, in their work tried to catalog earthquakes and tsunamis in the Indian Ocean region. In a period of more than two thousand years from the 4th century BC to the beginning of the 3rd millennium, Nias Island was recorded to have been shaken by an earthquake since the 18th century, namely in 1797 with a magnitude of 8.2 on the Richter scale (Rastogi and Jaiswal, 2006).

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Figure 1: Nias Island  
Source: Beetham & Sinclair (2008)

However, on the other hand, due to the many natural disasters that hit the area, it has left a legacy in the form of local wisdom in terms of disaster mitigation among the community which was born from various natural disasters that often occur. The people of Nias then have local wisdom to avoid and save themselves from various possible risks of earthquakes and tsunamis. For example, there are indications that the majority of Nias people "avoid" the sea. Even though their residence on Nias Island is surrounded by the vast sea of the Indian Ocean, the coastal areas are generally inhabited by migrants, especially the people of Aceh and Minangkabau. Then, there is also a tendency for people not to build their homes in the coastal lowlands, but prefer to live in hilly areas, even though they are located far inland. Likewise with traditional houses in Nias which are generally shaped like stilts and made of wood. Based on this phenomenon, the question arises whether this is a typical or normal thing, or is it a strategy of the Nias community to avoid the impact of the earthquake and tsunami? This article tries to find answers to these questions. This article aims to reconstruct the forms of local wisdom of the people of Nias Island in facing the earthquake and tsunami disaster.

## 2.0 Literature Review

One of the articles discussing the impact of the natural disaster of earthquakes and tsunamis in the Indian Ocean, including Aceh and Nias Island in 2004 and 2005, was written by Aloysius G. Brata et al. According to them, the area experienced shocks in 2005, in the form of adverse and positive shocks. Negative shocks came from the 2004 tsunami disaster and the Nias earthquake that occurred in 2005. Meanwhile, positive shocks came from the large amount of repair funds allocated after the earthquake and tsunami (Brata, Groot & Roetvel, 2014).

The following article is Sukawi's work entitled "Application of Local Wisdom Through Community Participation in Post-Disaster City Planning: Case Study of Teluk Nias Selatan City". In the article, he concludes that community involvement and participation in post-earthquake city planning is very necessary. This participation takes the form of community involvement in a planning forum or organization based on community strengthening. This is because one of the requirements for community participation in development planning activities is the existence of a sustainable forum or organization for the community to express their aspirations. On the other hand, these platforms and organizations can also play a role in disseminating policies from local governments to community groups at the grassroots level directly. Then the local wisdom of the community will be the basis for determining the form of policy that will be taken and implemented in the future. The article highlights some of the local wisdom of the people of Teluk Dalam, South Nias Regency related to their potential. Based on the results of collecting community aspirations based on local wisdom regarding the restructuring of Teluk Dalam City after the earthquake and tsunami, Teluk Dalam City has the potential for seas, rivers and beaches that can be developed as city waterfronts. This beachfront area can be used for recreational activities and is also suitable as a livelihood for fishermen (Sukawi, 2010).

Local wisdom can also be linked to cultural strategies. Three stages of the cultural strategy scheme, namely mystical or metaphysical, ontological and functional stages. The metaphysical stage is when humans try to take part in the supernatural reality that they think is around them. The ontological stage is when humans want everything that can be achieved naturally. Meanwhile, the functional stage is the area where humans want to establish new relationships with their environment in a creative and innovative way.

Cultural strategy is a process of innovation and creativity, which can be built if the production process can be explained. How is a cultural strategy created? This question is important because, first, if people cannot understand where cultural strategies come from, then they will not be able to appreciate that artistic strategies exist; second, we have to know where cultural strategies come from to understand where to look for them. A cultural strategy can be created if it is understood in the context of a community's collective identity, its relationship with other communities, and the existence of power in its implementation (Lloyd, 2010).

Mhd. Nur published a book entitled *Technology and Management in Mitigating Earthquake and Tsunami Disasters in the Mentawai Islands* which are located south of Nias Island. Disaster mitigation in the Mentawai Islands was carried out in several places after the earthquake and tsunami that occurred on October 25 2010. On that date the Mentawai Islands were rocked by an earthquake followed by a tsunami that occurred in the Siberut, Sipora, North Pagai and South Pagai areas, including the islands small island. The area included in the mitigation program in the Mentawai Islands has steep terrain and can only be reached by sea transportation. Villagers affected by the disaster generally live around the edge of a narrow beach covered in mangrove forests. For this reason, the government is carrying out mitigation by trying to move residential areas from the coast to the interior, far from the sea. This aims to avoid rising tsunami waves which usually occur after earthquakes (Nur, 2022).

### 3.0 Methodology

This article is qualitative research using historical research methods to answer problems, namely a four-stage method which includes heuristics, source criticism, interpretation, and historiography (Kartodirdjo, 1993). The data used was obtained through literature study and field visits looking for sources for interviews. The primary data obtained are reports from the Dutch colonial government and a limited number of travel reports, both made in the 19th century (Anatona et al, 2023). Apart from that, this article also uses the results of research by experts regarding natural disasters on Nias Island until the beginning of the 21st century. The approach used in this research is multidimensional, namely that an object of historical research can be observed from various scientific points of view, especially the social sciences and humanities. The local wisdom values of the Nias people, including in dealing with the natural disasters of the earthquake and tsunami, are assumed to be able to be implemented using a historical and anthropological approach, because they talk about ethnicity in a qualitative context.

### 4.0 Findings

There are several important findings in this article, namely, first, as an island that is often hit by natural disasters, earthquakes and tsunamis, the people of Nias responded and created strategies to avoid the risk of these natural disasters in two ways, namely by building settlements in highland and hilly areas and which is far from the reach of sea water. The second strategy, the people of Nias build earthquake-resistant traditional houses called *omo hada* or *omo sebua*. Attitudes or behavior and strategies in dealing with earthquake and tsunami disasters are based on the local wisdom of the people of Nias Island which was born based on accumulated experience and knowledge of natural disaster phenomena that have often hit the island for centuries. The final finding of the topic of this article is that the local wisdom of the Nias community, such as points 1 and 2, has an impact on lowering the risk level of both damage to building facilities and loss of life due to the earthquake and tsunami. natural disaster on Nias Island.

### 5.0 Discussion

#### 5.1. Residents Pattern

There are indications that the majority of Nias people "avoid" the sea, even though their homes are surrounded by the vastness of the Indian Ocean. Not many Nias residents work as fishermen, and generally work as farmers. They grow plants which are the main crops for farmers, such as rice, cassava, and others. Some types of old plants are coconut, rubber, durian, and so on. The Nias people who inhabit Nias Island prefer to live in the highlands, or if they have to live in valleys near springs and work on agricultural land, they will build settlements or *banua* in the middle of layers of hills or mountains or popularly called *hili* in the Nias language. They created residential villages which in local language are called villages that are neat and well-organized.

The word *hili* in the Nias language means hill or mountain. Many village names on Nias Island use the name *Hili*, this indicates that the initial settlement pattern of the Nias people was in the highlands. Initially, most of the *banua* locations on Nias Island were on hills or mountains, such as in Gomo, the first settlement of the ancestors of the Nias people, which was located in Central Nias. Similar things were also found in other areas such as *Banua Fadoro Bahili*, in West Nias. Apart from the two names above, several village names that use the word *hili* include *Orahili*, *Hili Harifa*, *Siso Bahili*, *Hiligoe*, *Hili Simaetanö*, *Hiligona*, *Hili Lölöwalu*, *Hilizihono*, and so on.

Several factors were the reasons for choosing a residential location on Nias Island; one of the main factors is that defense can be seen from 3 aspects, first, defense in the face of natural disasters, especially tsunamis. The people of Nias are better off avoiding than facing the tsunami. Avoiding here means establishing settlements on higher ground and far from the coast, so that when sea water hits they feel safe because the tsunami waves cannot reach them. Second, defense from enemy attacks. Danandjaja and Koentjaraningrat (1997) call it defense in war, although without explaining in more detail. It cannot be denied that defensive factors from war periodically occur on Nias Island. Until the mid-19th century, the rural situation, especially in the interior of Nias Island, was still volatile. Conflicts often occur, resulting in small-scale, limited wars between residents there, especially in the southern part of Nias. Local leaders and people are hostile to each other. Villages here are divided into small groups that often come into conflict. In 1859, van Swieten reported

that the conflict between residents in Lagundi village, South Nias had caused severe suffering due to various criminal acts such as murder, arson and human kidnapping.

### 5.2. The Traditional House

The Nias tribe also has a traditional house called *omo hada* or *omo sebua* (big house). Some local wisdom in building traditional houses is related to vernacular architecture which has a very open and comprehensive concept. Vernacular architecture is a term that also represents primitive or original architecture, indigenous architecture, ancestral or traditional architecture, rural architecture, ethnic architecture, informal architecture, or architecture without architects. Vernacular architecture as "community buildings that emerge to answer existing needs, are adapted to the environment, and are built by people who clearly know the desired needs", is influenced by various aspects, ranging from human behavior to environmental conditions, which shape the building. varies depending on function. Bambowo Laiya (1975), the form of houses on Nias Island is divided into two, namely traditional houses and coastal houses, which are influenced by external architectural elements. People in West Nias call it *omo drawa*. Even though this division is not proportional, considering that the definition of coast is an area along the coast, it can be concluded that these traditional houses are located inland, but it can be understood that the people of Nias only know two types of houses. namely traditional houses and coastal houses. Traditional houses are also called traditional houses. The location of the houses in each village is neat and orderly. In the southern part of Nias it is U-shaped, while in the northern, western and central parts of Nias the village pattern is parallel.

Almost all components of traditional houses on Nias Island are made from wood that grows on Nias Island. The roof is made of leaves. Traditional houses are shaped like houses on stilts with holes. Three types of traditional houses in Nias are adapted to the geographical location of Nias Island. Traditional houses with an oval type are found in North and West Nias; rectangular shapes are found in southern Nias and the Batu Islands; and a combination of oval and rectangular shapes in the center of Nias (Laiya, 1975). The megalithic culture in Nias places stones as an important part of the life of the people of Nias Island. The building is made of stone and is also made with vertical pillars without anchors in the ground but rests on stone blocks. The vertical pillars are reinforced with inclined piles, resulting in a three-dimensional structure that is highly earthquake resistant. A large scale earthquake occurred, causing much damage to buildings and infrastructure across the island. Good earthquake-resistant brick buildings survive without significant damage. The unique traditional wooden house of Nias was not damaged (Beetham & Sinclair, 2008). The application of traditional construction which also acts as an element of self-defense, especially defense against earthquakes, which reflects the real practice of local knowledge and wisdom in addition to the cosmos issues that surround it (Prasetyo, 2013).

Second, this construction did not use nails but was assembled in such a way using technology based on local knowledge and this is stated in the Nias proverb in building traditional houses: "*aro ni tuwö moroi ba ni osö*," stronger or more resistant to assembly than using nails. Understandably, nails made of metal are imported goods. Buying and selling transactions in Nias in the 19th century stated that one of the commodities supplied to Nias Island was iron and guns. The means of exchange used in trade are gold, copper, iron, firearms, cloth, glassware, tobacco, and others (Rappard, 1909).

Third, the pillars of traditional houses do not directly touch the ground but are placed with flat stones, driven directly into the ground. It is not known for certain when this traditional house was first built on Nias Island, it is estimated that the construction of this house started when the Nias people first arrived on Nias Island and has been going on for generations. The architectural ornaments of traditional houses in the southern part of Nias resemble boats. Elio Modigliani, an Italian adventurer visited South Nias in 1886, he saw that traditional houses which were then called big houses already existed on Nias Island (Modigliani, 1890).

Then, in the major earthquakes of 2004 and 2005, the number of deaths throughout the island was very minimal, according to Gruber and Herbig, only one person was recorded in the 11 villages they visited in 2005. There were no fatalities during the March 28, 2005 earthquake by the destruction of traditional houses. Meanwhile, others suffered minor injuries such as abrasions and broken bones, unable to withstand the shock of the earthquakes that frequently rocked this island for centuries, until the 2004 and 2005 earthquakes.

There are thousands of traditional houses on Nias Island. However, due to age plus other factors such as people's desire to build concrete houses plus the difficulty of getting quality wood as material for making traditional houses, the number is decreasing. One more thing, when the 2005 earthquake and tsunami occurred, all donor agencies organized by the Reconstruction and Rehabilitation Agency (BRR) only provided assistance to residents experiencing the disaster in the form of building concrete houses. Until 2013, there were only 1,112 houses spread across various places on this island, most of which were recorded in South Nias, and 372 were the result of renovations carried out by the Nias Heritage Museum Foundation. The foundation had a renovation program in place prior to 2000 due to concerns not only from a historical perspective but also from a safety perspective. After 2005, this was carried out intensively, considering that the need for houses was very high, more than 500 traditional houses had been renovated, both heavily damaged and slightly damaged.

## 6.0 Conclusion and Recommendations

The conclusion that can be drawn from the discussion of this article is that there is a connection between natural disasters in the form of earthquakes and tsunamis that have been going on for centuries on Nias Island and the local wisdom of the Nias people who live on Nias Island. Long life experience has given rise to knowledge from past generations of Nias people to the present, in the form of local wisdom in avoiding and minimizing the negative impacts of earthquake and tsunami disasters. This local wisdom can be categorized as a form of natural disaster mitigation that originates from the internal strength of the Nias community.

As a recommendation, the existing local wisdom model should be maintained and passed on to future generations because throughout its history, Nias Island has often been hit by earthquakes and tsunamis. For further research, it is necessary to include

technological aspects in the construction of traditional earthquake-resistant houses on Nias Island so that there is a combination of traditional elements with modern technology.

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### Paper Contribution to Related Field of Study

Hopefully the results of this article can contribute to the field of history of natural disaster mitigation, especially earthquakes and tsunamis.

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