**DISASTER MANAGEMENT IN TSUNAMI DISASTER MANAGEMENT IN LAMPUNG SELATAN**

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***Abstract***

This study wants to analyze two things: (1). How is multistakeholder governance in handling tsunami disasters in South Lampung, (2). What are the challenges that have emerged in the governance of tsunami disaster management in South Lampung ?. This research was conducted in a descriptive qualitative manner which analyzed the regulative, technical and implementative aspects that occurred at the focus of the research discussion. Data was collected from the Regional Government, DPRD and leaders of community and private organizations involved in this research. Data collection was carried out in three ways, namely library research, interviews, observation and field documentation.

The results of this study identified the involvement of government groups in the construction of temporary shelter, namely: local government and the Indonesian National Army, community organization groups namely Muhammadiyah and Nahdlatul Ulama, and private groups namely Icon + and PT.KIM. The collaboration of the three parties has had a positive impact on refugees, while at the stage of permanent housing development, the role of the district government and provincial government is at the forefront, where authority related to land and infrastructure development is indeed under the two governments, while the private sector and community institutions begin to diminish its role. The challenges in disaster management in the South Lampung region are related to post-rehabilitation activities and anticipation of potential disasters that can still occur in the region in the future. These challenges include; (a). Not optimal Disaster Mitigation Infrastructure, and (b). Consistency of Coastal Pro-Environment Policy.

**Keywords: Governance, Disaster Management, Tsunami**

**INTRODUCTION**

Indonesia is a country that has a high vulnerability in natural disasters, it is recorded that almost all the islands in Indonesia have disaster risks in various types (Sudibyakto, 2018). One province that often faces disasters is Lampung Province, this can be seen from the following 2018 data:

**Table 1. Types of Disasters and Impacted Losses**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Code** | **Disaster** | **Number** | **Dead** | **Injured** | **Severely** | **Heavy Damaged Houses** | **Medium Damaged Houses** | **Light Damaged Houses** |
| 101 | FLOOD | 17 | 3 | 3 | 3625 | 156 | 25 | 115 |
| 102 | LANDSLIDE | 4 |   |   |   |   | 4 | 3 |
| 104 | PAIR/ABRATION WAVE | 1 |   |   |   | 11 |   |   |
| 105 | PUTING BELIUNG | 5 |   | 4 |   | 3 | 13 | 81 |
| 106 | DROUGHT | 4 |   |   |   |   |   |   |
| 109 | TSUNAMI | 1 | 126 | 4008 |   | 600 | 70 | 1029 |
| 111 | ERUPTION OF VOLCANO | 1 |   |   |   |   |   |   |

Source: BNPB, 2018

From the table it can be seen that the Lampung Province region experienced various forms of disaster, one of the biggest disasters causing casualties is the tsunami. In this case the Sunda Strait tsunami occurred in the South Lampung region at the end of 2018. The table shows that the death toll was 126 people and 4008 people were injured. While material losses in the form of a number of houses were seriously damaged as many as 600 people, moderately damaged 70 people and slightly damaged as many as 1029 people.

Based on information presented by the Meteorology, Climatology and Geophysics Agency (BMKG), it was reported that the Geological Agency of the Ministry of Energy and Mineral Resources (ESDM) and the Center for Volcanology and Geological Disaster Mitigation (PVMBG) had detected eruption activity at Mount Anak Krakatau, Lampung, on Friday 21 December 2018. Eruption occurred with a high ash column around 400 meters above the summit and 738 meters above sea level. The ash column was observed to be black with a thick intensity leaning north. At that time, Gunung Anak Krakatau was at level II status or alert. Then, an eruption of Mount Anak Krakatau erupted which triggered a landslide on the slopes of Mount Anak Krakatau covering an area of ​​64 hectares on Saturday, December 22, 2018 at 20.56 West Indonesia Time. Furthermore, at 21.03 WIB the event was recorded on the BMKG seismograph sensor in Cigeulis Pandeglang (CGJ) and several sensors in the Banten and Lampung regions. However, the BMKG earthquake automatic process system does not process automatically, because the recorded vibration signal is not a tectonic earthquake signal. At exactly 21:30 WIB, BMKG Earthquake and Tsunami Center officials received reports of public panic in the Banten and Lampung regions, due to abnormal tidal sea water. BMKG immediately conducts a Mariide Tide Gauge Geospatial Information Agency (BIG) examination. As a result, sea level changes were indicated in several areas such as in Jambu Beach, Serang Regency, with water levels reaching 0.9 meters, in the Port of Ciwandan, Banten, the water level was 0.35 meters, in Kota Agung, Lampung the water level was recorded at 0.36 meters, and at the Port of Panjang, Bandar Lampung City recorded a water level of 0.28 meters. Looking at the results of BIG tide gauge marigran records, BMKG believes that this is a tsunami wave. At 22:30 WIB, BMKG immediately issued a press statement related to the tsunami that had struck Banten and Lampung that were not triggered by a tectonic earthquake (CNN Indonesia, 2018).

The tsunami disaster was then addressed by the Central and Regional Governments, where their involvement was a mandatory duty of the government to protect its people. The existence of regulations on disaster management is one of the main things needed in the presence of a country in the midst of a disaster (Kartika, 2017). This is mandated by Law Number 24 Year 2007 Article 5: that the Government and Regional Governments shall be responsible for the management of disaster management. These government responsibilities include: (1). Disaster risk reduction with development programs, (2). Protection of the community from the effects of disasters, (3). Guarantee the fulfillment of the rights of people and refugees affected by disasters fairly in accordance with minimum service standards, (4). Recovery of conditions from the impact of disasters, and (5). Allocation of disaster management budget in the form of ready-to-use funds. The manifestation of its implementation is outlined in the local government program. Based on this regulation, the government becomes the main actor who manages disasters and carries out all phases of disaster management (Kusmiati, 2005).

Disaster management thus becomes urgent in disaster areas, South Lampung Regency as one of the affected areas needs adequate organization and management of disaster management, considering that disasters cannot only be handled by one or two organizations. Therefore, in this study we want to analyze two things, namely: (1). How is multistakeholder governance in handling tsunami disasters in South Lampung, (2). What are the challenges that have emerged in the governance of tsunami disaster management in South Lampung ?. These two research questions are intended to be elaborated in the discussion in the next section.

**RESEARCH METHODE**

This research was conducted in a descriptive qualitative manner which analyzed the regulative, technical and implementative aspects that occurred at the focus of the research discussion. Data was collected from the Regional Government, local DPRD and leaders of community and private organizations that are considered masters of the research theme. Meanwhile, data collection will be carried out in three ways, namely a literature study that includes disaster management reference materials in the research area, interviews with informants, observations and field documentation. In addition, secondary data collection in the form of data and information relevant to be used in this research was also carried out, including identifying governance in disaster management in accordance with existing conditions, also through analysis of best practices activities that have been formulated, developed or applied to the area of ​​study. The analysis used in this study is an interactive analysis model with data reduction work procedures, data presentation, data verification and drawing conclusions (Miles & Huberman, 1994).

**RESULT AND DISCUSSION**

The occurrence of the tsunami disaster before the turn of 2018 caused by the eruption of Mount Anak Krakatau and pushed the material of landslides around 64 hectares of material into the ocean. It is estimated, the volume of the collapse reached 150-180 million cubic meters. The avalanche is also believed to have created the Sunda Strait tsunami that hit coastal areas of Lampung and Banten Provinces. It is estimated that the total death toll reached 430 people and injured thousands of people. Various facilities and infrastructure on the coast of the Sunda Strait, including the coast of South Lampung suffered severe damage. Head of Volcano Mitigation Sub Division of Western Region Center for Volcanology and Geological Disaster Mitigation of the Geological Agency (PVMBG) Ministry of Energy and Mineral Resources (ESDM) Kristianto stated that based on visual and measurement observations, Gunung Anak Krakatau's height was originally 338 meters, then only 110 meters. It was at once confirmed that the tsunami that occurred one of the causes was the avalanche of the material of the Anak Krakatau crater. The disaster became the center of attention of citizens of the world community and responded quickly by the government by deploying rescue teams and carrying out collaborative disaster management activities involving various stakeholders. In the event of a disaster in South Lampung, multistakeholder cooperation was found to be evident in several phases of disaster management. This will be explained in the discussion below.

**A.Multistakeholder Governance in the Emergency Response Phase**

The Tsunami Disaster in South Lampung was followed up with an emergency response phase with a time interval of December 23, 2018–19 January 2019. The phase was implemented in 3 stages; (1). Emergency Response is based on Decree No: B / 400 / VI.02 / HK / 2018 with December 23, 2018 - December 29, 2018, (2). Extension of Emergency Response I is based on Decree No: B / 405 / VI.02 / HK / 2018 with 30 December 2018-05 January 2019, and (c). Extension II of Emergency Response is based on Decree No: B / 30 / VI.02 / HK / 2019 with January 6, 2019–19 January 2019. The focus of the second phase of emergency response is the search for victims who are reportedly still missing and meeting the basic needs of affected refugees the impact of the Sunda Strait tsunami in South Lampung. In this phase the activities of evacuation and disaster victims were carried out simultaneously and involved three groups of organizations; government (civil and military organizations), community organizations and private parties. If you look at the distribution of disaster locations it can be understood if joint movements are needed in this phase. The location of the disaster was also in the waters of Lampung, namely Sebesi Island and Legundi Island. This can be observed from the following image:

**-**

**368**

**-**

**9**

**-**

**1**

**-**

**436**

**-**

**7**

**-**

**-**

**11**

**3.473**

**-**

**144**

**858**

**2**

**100**

**7.705**

**7**

**662**

**4.424**

**6**

**1**

**-**

**-**

**-**

**244**

**-**

**2**

**412**

**-**

**-**

**77**

**-**

**8**

**-**

**-**

**-**

**-**

**-**

122

12.275

7

817

5.603

9

**Figure 1. Distribution of Tsunami Impacts in South Lampung Regency**

From the picture above it can be seen if the distribution of the impact of the Sunda Strait tsunami in South Lampung covers the mainland and islands which are close to Mount Krakatoa. Noted in the South Lampung region there were 12 fatalities affected by the Sunda Strait tsunami. In the initial phase of the emergency, coordination between actors was carried out in a joint team of Basarnas, BPBD, TNI, medical teams and volunteers focused on the evacuation of victims affected by building debris in Kunjir and Way Muli and Cugung Villages in Rajabasa District in Pesawaran District. Emergency management is carried out by BNPB together with the TNI, Polri, Basarnas, Ministry of Social Affairs, Ministry of Health, Ministry of PUPR, Ministry of Energy and Mineral Resources, as well as relevant ministries and institutions that continue to assist local governments in handling emergencies. While the Provincial and Regency Governments continue to coordinate with various parties in the procurement of coordination posts, health posts, public kitchens, and refugee posts established to handle victims.

In the early days of the emergency the coordination role was carried out by BNPB and Basarnas as institutions that had the role of disaster management and rescue of victims related to disasters. Under their coordination, the joint team scoured the disaster site and took the necessary actions to rescue and minimize casualties. Meanwhile, the regional government was given a role to support the joint team in the form of mobilizing medical personnel and emergency health service facilities. The coordination carried out at this critical stage is an important part that determines the effectiveness of the activities afterwards (Ariyanto, 2018).

**B. Multistakehoder Governance in the Disaster Recovery Phase**

The recovery phase from disasters is marked by the reduction in the role of BNPB and Basarnas, then the role of disaster recovery is given to the Regional Government (Provincial and District Governments). However, cooperation was identified that involved various parties in the region and outside the region in the construction of temporary shelters (Huntara) and permanent residences (Huntap). Furthermore, the form of multi-stakeholder cooperation can be explained in the section below.

**1. Stage of Development of Shelters**

Temporary shelters are built based on the needs of handling refugees who initially lived in tents and began to be exposed to several types of diseases. In addition, the available tents began to feel uncomfortable for the victims in carrying out household activities (Santoso, Felecia, & Panjaitan, 2016). Therefore, based on the initiative of the South Lampung Regency Government, temporary shelters were built which involved several non-government parties. The distribution of locations and building of temporary housing can be observed from the table as follows:

**Table. Temporary Residential List (HUNTARA) Involving Several Parties in South Lampung**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Location** | **Willing to Inhabit** | **DEVELOPER PARTY** | **PLAN****(UNIT)** |
| **1** | **KUNJIR** | **138** |  **PEMDA/PT. KIM** | **138** |
| **2** | **WAY MULIH TIMUR** | **122** | **PEMDA/PT. KIM** | **122** |
| **3** | **WAY MULI INDUK** | **48** | **TNI** **ICON +****PEMDA/ PT. KIM** | **20****3****25** |
| **4** | **RAJABASA** | **29** | **MUHAMMADIYAH****KODIM (PGTI)** | **20****20** |
| **5** | **BANDING** | **13** | **NU** | **20** |
| **6** | **SUKARAJA/ PANGKUL** | **18** | **NU****NU** | **17****10** |
| **7** | **KALIANDA (EX HOTEL 56)** | **22** | **PEMDA** | **64** |
| **8** | **SIDOMULYO** | **2** | **MUHAMMADIYAH** | **3** |
| **9** | **KATIBUNG** | **6** | **MUHAMMADIYAH** | **6** |
| **10** | **SEBESI - SEBEKU** | **42** | **PEMDA** | **EX HOTEL 56** |
|  | **JUMLAH** | **440** |  | **468** |

**Source: Data on Government Sector of Lamsel Regency Government, 2019.**

From this table can be identified the involvement of government groups namely: local government and the Indonesian National Army, community organization groups namely Muhammadiyah and Nahdlatul Ulama, and private groups namely Icon + and PT.KIM. The collaboration of these three parties has had a positive impact on refugees, so that the availability of temporary shelter can prevent further social, economic and health impacts. In this collaboration the role of the South Lampung regional government as policy makers and coordinators is to direct community organizations and private groups to be able to contribute and participate in dealing with refugees.

**2. Phase of Permanent Residential Development (Huntap)**

 This permanent residential construction phase began with the establishment of the Land Procurement Preparation Team for the Provision of Huntap Land through the Decree of the Regent No. B / 132 / IV.05 / HK / 2019 dated January 22, 2019. Based on the decree, the Land Procurement team conducted a survey with the team from the South Lampung Land Office (Kantah). Meanwhile, in the process coordination was also carried out with BNPB and PVMBG related to the condition of the vulnerability of permanent residential locations (Huntap). Then, in the next stage the Submission of South Lampung Regent submits a proposal for the determination of the location to the Governor through Letter Number 593/1125 / I.01 / 2019 dated March 28, 2019 until then a discussion on the proposed location determination is land in Kunjir Village and East Way Muli Village , led by the Lampung Province Economic and Development Assistant, on April 2, 2019. As a sign of good cooperation, the provincial government / governor agreed to determine the location. The location which is the residential development plan can still be observed from the following table:

**Table. Distribution of Target Locations for Permanent Residential Development**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Location** | **Location Area** | **Explanation** |
| 1. | Desa Kunjir | - Location 1 is ± 9,600 m² owned by Ahyarudin- Location 2 is ± 7,000 m² owned by Rio Imanda- Location 3 area ± 6,000 m² owned by Meino Mitia | The three locations are located close together, surveyed by the Lamsel District Government Team and BPN |
| 2. | Desa Way Muli Timur | - Location 1 area ± 8,000 m² belongs to Masifah- Location 2 area ± 5,000 m²- Location 3 area ± 3,500 m² | The three locations are located close together, surveyed by the Lamsel District Government Team and BPN |
| 3. | Desa Sukaraja | 1 location is ± 3,000 m² | surveyed by the Lamsel District Government Team and BPN |
| 4. | Desa Rajabasa | - Location 1 area ± 1,200 m²- Location 2 area ± 5,000 m² | The two locations are separate, surveyed by the Lamsel District Government Team and BPN |
| 5. | Desa Maja | - Location 1 area ± 2,500 m²- Location 2 area ± 1 Ha | The two locations are separate, surveyed by the Lamsel District Government Team and BPN |
| 6. | Kelurahan Bumin Agung (Beringin) | - Location 1 area ± 7,000 m²- Location 2 area ± 3,500 m² | The two locations are separate, surveyed by the Lamsel District Government Team and BPN |
| 7. | Kalianda Bawah (Air Panas) | 1 location is ± 5,000 m² | surveyed by the Lamsel District Government Team and BPN |

**Source: Data on South Lampung Government Sector, 2019.**

 From this table, it can be seen that the largest area is Desa Kunjir and Desa Way Muli Timur where the three locations of each village are close together and have been surveyed by the South Lampung regency government team and the National Land Agency. At this stage the role of the Regency and Provincial Governments is at the forefront, where the authority related to land and infrastructure development is indeed under the two governments, while the private sector and community institutions begin to diminish. It can be understood that this phase is a phase that is long term and involves complete infrastructure (Suprayitno & Soemitro, 2019).

**C. Challenges to Disaster Governance Development in South Lampung**

Looking at disaster management in South Lampung, there are challenges that are identified as important things to anticipate. This challenge is related to disaster management in the South Lampung region after rehabilitation and considering the potential for disasters to occur in the region in the future. These challenges include:

**a. Tsunami Disaster Mitigation Infrastructure**

Regarding earthquake and tsunami disaster mitigation it is known that since 2005, the Meteorology Climatology and Geophysics Agency (BMKG) has established a tsunami early warning system in Indonesia, InaTEWS (IndonesiaTsunami Early Warning System). The goal is to provide early warning to the community if there are indications of a tsunami threat. However, the application of technology-based mitigation still has shortcomings. It is known that BMKG does not yet have a warning tool to detect tsunamis caused by volcanic earthquakes. In fact, when referring to BMKG data, the Sunda Strait tsunami was caused by an underwater avalanche impacted by the activities of Mount Anak Krakatau, and tidal waves due to the full moon. The early warning system that we have now is only for tsunamis due to earthquakes or tectonics. For volcanic, there is no early warning. Moreover, it happened at night which visually did not show any volcanic activity.

But even more alarming is that not all areas at risk of disaster are equipped with sensors, both landslides and floods and tsunamis, even though landslides have caused quite a lot of casualties. At present there are only 300 to 400 landslide detection devices, whereas the needs of thousands. Flooding too, still faces the condition of an early warning system that is still lacking. Then it is necessary to develop a multistakeholder warning system. At the system level there is a need for an integrated disaster warning system (multi hazard early warning system). At present, the management of BMKG's tsunami early warning data, while data on volcanoes is still held by volcanology and geology. Therefore, a multistakeholder warning is needed that is not independent, but integrated and even based on efficient applications (Utama, Lusiani, & Churniawan, 2018). Regulations regarding the multistakeholder warning system need to be prepared which will continue in the implementation of mitigation.

In order to build an integrated system, on the other hand coordination is also needed so that people are not confused by the interests of each institution in dealing with disasters, such as the tsunami disaster in South Lampung. In addition, residents need to reassert their situation on the coast, including tsunami hazard or not and have an optimal understanding of disasters (Rini, 2017). If they can return, it is necessary to emphasize the precautionary principle by trying to be community-based independent in building early warning systems (Rijanta, Hizbaron, & Baiquni, 2018). In addition, the government must ensure that all devices work properly according to the standard operational procedures and rules of the early warning system focused on the community (Mardiah, Lovett, & Evanty, 2017). Develop appropriate tools for the local community and consciously maintain the system by promoting the precautionary principle.

**b. Consistency of Coastal Pro-Environment Policy**

The Sunda Strait tsunami disaster shows that some areas where mangrove forests have been exhausted or damaged have received significant impacts compared to other places. One of them is Betung Bay, Rajabasa District, South Lampung Regency, Lampung. It is known that the greatest tsunami impact was experienced by villages on the coast of Rajabasa District, South Lampung. His position is in direct line with Mount Anak Krakatoa. This is known by the Bentala Mitra community organization that has been conducting mangrove rehabilitation in Lampung. This condition is different from villages in Lampung Bay, where mangroves are still in good condition or have been rehabilitated, for example in Sidodadi, Gebang, Batu Menyan, Pahawang Island. The perceived impact is not so bad because mangroves are maintained.

The extent of the coastal area that must be rehabilitated in Lampung Bay and other areas has not yet been ascertained, because the data is still confusing. But if you look at the potential of villages that naturally have a mangrove ecosystem, it needs to be maintained, for example in Lampung Bay, East Coast and Semangka Bay. Based on 2015 Lampung Government data, the area of ​​mangrove in Lampung is around 17,110 hectares. Damaged conditions are around 54 percent. So around nine thousand hectares of mangrove forests in Lampung must be rehabilitated. The damage occurred due to shrimp and fish farming activities, as well as infrastructure development on the Lampung coast which is about 1,105 kilometers in length.

Though mangrove coastal forests can be beneficial for communities along the coast that enter the red zone the danger of earthquake and tsunami. There are several types of trees that can be found in several places and serves as a natural barrier from tsunami strikes such as pule, ketapang, mahogany, waru, banyan and coconut (Kusmana & Ningrum, 2016). This view was confirmed by Abdul Muhari, a tsunami expert from the Ministry of Maritime Affairs and Fisheries who argued that coastal forests could reduce the rate of tsunami energy and hold large corals. The tsunami character in this area carries corals up to 10 tons ashore. Large diameter trees can put a halt to coral. However, tree planting was left to the district government, including involving the provincial Forest Service. Planting also takes into account how long the beach is, and each region of course there is a layer (Akbar, Sartohadi, Djohan, & Ritohardoyo, 2017).

Regarding the mitigation and adaptation of earthquake and tsunami prone areas, several efforts can be made by all parties, such as community preparedness. Socialization should continue to be given to all levels of society by all components, including the ulama. There needs to be socialization and strengthening of knowledge that touches the level of harmony in the red zone area (D. Santoso, Yamin, & Makhrus, 2019). In addition, regulatory issues, such as local regulations for all hotel managers on tsunami prone beaches are also expected to pay attention to environmentally friendly construction and not damage the ecosystems that are around the location.

**CONCLUSION**

Based on the discussion that has been described, then there are some conclusions as follows:

1. At the stage of the construction of temporary shelters the involvement of government groups was identified in the development of Huntara, namely: the local government and the Indonesian Armed Forces, community organizations namely Muhammadiyah and Nahdlatul Ulama, and private groups namely Icon + and PT.KIM. The collaboration of the three parties has a positive impact on refugees, so that the availability of temporary shelter can prevent further social, economic and health impacts. In this collaboration the role of the South Lampung regional government as policy makers and coordinators is to direct community organizations and private groups to be able to contribute and participate in dealing with refugees.
2. At the stage of permanent housing development, the roles of the Regency and Provincial Governments are at the forefront, where the authority regarding land and infrastructure development is indeed under the two governments, while the private sector and community institutions begin to diminish. It can be understood that this phase is a phase that is long term and involves complete infrastructure.
3. Challenges in disaster management in the South Lampung region related to post-rehabilitation activities and anticipation of potential disasters that could still occur in the region in the future. These challenges include; (a). Not optimal Disaster Mitigation Infrastructure, and (b). Consistency of Coastal Pro-Environment Policy.

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