DISASTER RISK MANAGEMENT in PALU CITY

(case study of natural disasters September 28 2018)

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Abstract

Palu City is one of the provincial capitals in Indonesia which is right on the Equator line. In addition, this city is one of the many regions in the eastern part of Indonesia that have a considerable potential for natural disasters. The natural disaster that occurred in Palu on September 28, 2018 consisted of three types of disasters, the first was an earthquake, the second tsunami and the last was liquefaction. This natural disaster caused damage to supporting infrastructure and thousands of people died. The large number of fatalities illustrates that the preparation and preparedness of the community and local government authorities are still low, mainly due to a lack of knowledge and concern for these natural phenomena and their consequences. The earthquake and tsunami disaster that took place in the city of Palu Sigi and Donggala was a momentum to change the paradigm of disaster management by increasing community preparedness. This research tells the story of the phenomenon of the three natural disasters, also tried to explain the steps and design of disaster mitigation. Disaster Mitigation must be implemented to reduce the risk of natural disasters. Public policy about community preparedness towards disaster management is very important and urgent to do in order to reduce disaster risk. Disaster cases in Palu City as a case study are considered relevant for the implementation of disaster management systems.

Keywords: *disaster management, risk reduction, community preparedness*

INTRODUCTION

Palu City is the capital of Central Sulawesi Province with a geographical location located in the coordinates of 0.35 - 1.20 LU and 120 - 122.90 BT. Palu City is a five-dimensional city consisting of valleys, oceans, rivers, mountains and bays. Palu City is one of the provincial capitals in Indonesia which is right on the Equator line. One of the many regions in the eastern part of Indonesia which has a large potential for tsunami is Palu City and its surroundings. There have been three times recorded around Palu Bay, namely in 1927, 1968 and 1996, while around Palu City (Central Sulawesi) there were 6 events [1]. The earthquake occurred in Indonesia in the span of two years, namely in 2017 and 2018. The earthquake was linked to the fact that Indonesia is an archipelago that includes many volcanoes, faults, and meeting points between the Australian plate and the Asian plate along the south. Indonesian coastal areas to the western coast of Indonesia [2]. The occurrence of natural disasters that occurred in the city of Palu on September 28, 2018 saw a pattern of government coordination as if helpless. When the tsunami struck, almost all government agencies that were authorized to regulate and provide assistance to victims in Aceh were 'paralyzed'. A small part of the government apparatus became a victim, while the officers who were still alive, were busy saving themselves and their family members [3].

Natural disasters that occurred in the city of Palu occur in three types of disasters, first is an earthquake, the second tsunami and the last is liquefaction. Liquidation is a phenomenon of the loss of soil strength due to earthquake vibrations [4]. Tectonic earthquakes have occurred in Donggala District, Central Sulawesi on Friday, September 28, 2018, at 17.02.44 WIB with M 7.7 Location 0.18 LS and 119.85BT and a distance of 26 km from the North Donggala Central Sulawesi, with a depth of 10 km [5]. Natural disasters that occurred in the city of Palu occur in three types of disasters, first is an earthquake, the second tsunami and the last is liquefaction. Liquidation is a phenomenon of the loss of soil strength due to earthquake vibrations [4]. Small vibrations occur throughout the day, but a 7.4 earthquake on the Richter scale takes place when the Palu Koro Fault that crosses the city of Palu, shifts about 10 kilometers below the ground. Since then, there have been at least 500 aftershocks in Palu, most of which were not felt by residents. [5]

Picture 1 ; Earthquake Map September 28 2018 (BMKG)

Looking at the geographical position of Palu City which is in one of the active faults in Sulawesi, the Palu Koro fault which extends approximately 240 km from the north (Palu City) to the south (Malili) to the Gulf of Bone. This fault is an active synistral fault with a shifting speed of around 25-30 mm / year [6]. So that a level of integrated mitigation measures is needed. In addition, understanding the characteristics of the source of the disaster is also very important in order to estimate the potential disasters that may be caused as well as to reduce the impact of disasters on the lives around them and public facilities that exist around the location [7]. However, like other disasters, this disaster received full attention from the government. The local community also does not remain silent. Communities actively participate in taking part and working together in accordance with their abilities in post-disaster recovery [8]. One thing that needs to be considered by the public in the disaster mitigation process is knowing the evacuation route. Regarding evacuation routes, routes with a high index of tsunami victims must be kept free of evacuation before the tsunami reaches. This is also possible by using tall buildings located within the tsunami inundation area. On the other hand, coastal areas containing sandy and muddy material tend to have a higher tsunami risk [9]. The events of various natural disasters that occurred in Indonesia and various other countries in the world, have created an experience of disaster response and recovery efforts. Disaster response and recovery efforts involve relationships between government and aid organizations, and communities [10]. Disaster management management as management of various efforts and actions taken for disaster prevention, taming or mitigation, rescue, rehabilitation and communication, both before, during, and after a disaster event [11]. The main purpose of community protection is to reduce casualties, injured victims, property loss, environmental damage, social and economic disturbances as a result of natural disasters [12].

Figure 2: Distribution of earthquakes around the Palu Koro fault [6]

METHOD

This article uses a qualitative approach with various phenomenologies. The discussion in this article will also try to describe the disaster mitigation management process carried out in the event of a disaster. In addition, data collection was carried out through interviews, focus group discussions (FGD) along with scientific findings, so that the results of the research became more accurate and systematic.

FINDINGS

In the event of a disaster, the people of Palu city seemed to panic about the conditions they had just faced this time, in their daily lives, earthquakes had become commonplace for them. Amirullah, one of the townspeople who has lived in the valley of Palu for 30 years, said that almost every time an earthquake and tremor is often felt, it has become commonplace for him as well as other Palu city people. The same thing was also conveyed by Sri Wahyuni, a migrant who settled in the city about 5 years ago, he also felt a small vibration during his stay in Palu City, but like other residents, he did not expect such an extraordinary event on September 28 .

One of the witnesses and victims of the disaster, Nur Alam told me that at the time of the incident he was in one of the second-floor cafe buildings near Talise beach. He felt the tremendous vibration during the first earthquake, he and the visitors of the cafe ran to the ground floor, although they had to fall several times, but were finally able to escape from the building, before the building was destroyed by a more powerful aftershock.

Amran, a resident of Palu city at the time of the incident in front of his shop, he told how residents panic when the earthquake occurred, the community seemed to run indeterminate direction, there were people running towards the field, some groups of residents who ran towards the mountains, those who took vehicles and try to avoid as far as possible from the city center. Amran further explained that residents who drove motorized vehicles during an earthquake tremor almost all fell from their vehicles, this is also one that resulted in injuries other than the rubble of buildings / other objects.

Panic occurred in every corner of the city, especially when the disaster occurred at 18.02 WITA, nearing the night. Shortly after the tremor occurred, the electricity network was cut off, as well as telecommunication networks and cellphones were cut off, thus increasing the panic of the residents. An earthquake measuring 7.7 on the Richter scale when it felt like a doomsday for residents who feel it. This earthquake is not the first, but this is the strongest that residents have ever felt. All victims of the Palu city disaster that were met, talked about the condition.

Figure 3: residents panic when the earthquake occurred
(source: informant)

Meanwhile, the power outages caused the communication network in Donggala and its surroundings to be unable to operate because the PLN electricity supply was broken. According to information from the BNPB website there are 276 base stations that cannot be used. Communication operators continue to try to restore electricity supply in an emergency. The Ministry of Communication and Information has taken steps to restore the broken communication. The head of BNPB and BNPB officials departed for Palu this evening through Makassar and then proceeded to Palu and Donggala City by helicopter. Mutiara Sis Al Jufri Airport Palu is closed from 28/9/2018 at 19.66 WITA to 29/9/2018 at 19.20 WITA. Meanwhile, BNPB's Rapid Reaction Team has also moved towards Donggala through Balikpapan. From Balikpapan, the BNPB Rapid Reaction Team flew to Donggala using the water bombing helicopter in Balikpapan. This team carries satellite communication equipment and other equipment. The TNI will mobilize troops to assist in handling the impact of the earthquake and tsunami in the cities of Palu and Donggala. The TNI moved 7 SSKs from Yonkes, Yonzipur, Yonif, and Yonzikon using 2 C-130 Hercules aircraft. Basarnas will mobilize 30 personnel along with equipment using Hercules aircraft. The National Police will also mobilize personnel and equipment to provide emergency handling support. The paralyzed communication currently causes difficulties for coordination and reporting with the regions. Power outages also caused complete darkness in Palu and Donggala. Aftershocks continue [13]

Latest information reported by Palu Tribun News Friday, March 1, 2019 Head of the Regional Development Planning Agency (Bappeda) of Palu City, Arfan said, his party had determined the number of fatalities and houses damaged by natural disasters September 28 2018. In the determination of stage 2, the number of fatalities and damaged houses have increased. That is for damaged homes, this increased from the previous 42,864 to 55,102 homes. The total number of damaged houses in phase 2 has increased by 12,238 houses, which are divided into 2,422 heavily damaged, 3,200 moderate damaged, 3,785 slightly damaged, and 2,831 missing, while for the second phase of casualties, there are an additional 515 people. That is, there were 476 people died, 39 people were lost In stage 1, the number of fatalities was 3,679 people, divided into 2,132 deaths and 531 missing. And those buried were not identified with 1,016 people. Dikaebumikan at TPU Poboya and TPU Pantoloan Boya.

Palu City disaster victims data update March 1, 2019

Source: Palu Tribun News Friday, March 1, 2019

City residents who survived the disaster said that the number of victims for each disaster was different. The highest number according to the citizens' thrust is in the case of liquidation, then the tsunami and finally the victims of the earthquake.

According to Andri, a teenager who survived the victims of liquefaction, told how victims of liquefaction did not know which direction they should run, because the land moved in all directions. Even one of the videos on one of the social media shows how houses, electricity poles and trees move around like water. So that it can be ascertained that the victims of liquidation are no longer able to save themselves in the event of a disaster.

Meanwhile, Enong, a survivor on the beach in Talise said how the beach visitors ran away from the beach because they had seen waves of water and the sound of sea water rumbling, different from victims of liquefaction, Enong and some residents on the beach, knowing where they should run , away from the beach.

Likewise, Nur Alam said, when an earthquake occurred and several buildings around them had fallen, they immediately exited the building and gathered in an area of land far from the building.

At night after the disaster occurred, all residents gathered in a safer place, many of them gathered in the nearest field. One of the gathering places for disaster victims is the Vatulemo field. The field is the town square of Palu. Right in front of the Vatulemo field, the Mayor's office and several Palu City Government offices were established.

Para korban gempa dan tsunami beristirahat di tenda pengungsian di Lapangan Vatulemo, depan kantor Wali Kota Palu, Sulawesi Tengah, Ahad, 30 September 2018. Lebih dari 16 ribu warga mengungsi akibat gempa dan tsunami di Sulawesi Tengah. TEMPO/Muhammad Hidayat

Figure 4: Conditions for refugees in the Vatulemo field

Meanwhile, all residents who became informants in this research said that until a few days they were in the evacuation site they did not see any activity from the local government authorities that gave attention in this case the Palu city government. Only volunteers from several humanitarian and religious organizations were the ones who most quickly provided assistance to them. Even logistical assistance from several neighboring cities / regencies is not maximally distributed to refugees.

Data confusion between volunteer posts and local government also occurred. Each questioned data from aid organizations. Meanwhile the local government authority cannot explain properly when the community asks about data of citizens who are entitled to receive assistance. It was also seen after the disaster how the Government of Palu City and Donggala District seemed confused and did not establish communication between institutions, this was because local government officials had never been provided with knowledge related to disaster mitigation. Even though geographically the city of Palu and some neighboring districts are above the most active faults in the world.

Electronic media also wrote about the conditions related to government regulations when a disaster occurs. Even though the regulation has provisions, the local government seems to be looking for safety by not relocating APBD funds for emergency response funds. From the information obtained, only Sigi District quickly issued emergency response funds for disasters in its area. As for Palu City and Donggala Regency, the local government is waiting for assistance from outside [14].

DISCUSSION

Disaster management is a dynamic process regarding the operation of management functions that we know so far, for example planning, organizing, actuating, and controlling functions. The way disaster management works is through activities that exist in each quadrant or cycle or field of work, namely prevention, mitigation and preparedness, emergency response, and recovery. While the purpose is generally among others to protect the public and their property from the threat of disaster [15].

Operations management in the context of a disaster is seen as managing all activities in the operational process of disaster relief effectively. Effective means doing the right action to create the best value in four stages of management disasters as quoted by Kiefer and Montjoy from Waugh (2000), namely warning stages (prevention), planning and preparation (planning and preparedness), responses (responses) and recovery. Disaster events have different characteristics, but essentially have the same concept of disaster relief cycles in disaster management. The disaster management cycle describes the process of disaster management which is essentially a pre-disaster action, ahead of a disaster, during a disaster and post-disaster. [10]

Disaster Management Cycle Diagram

As narratives from victims and eyewitnesses show that the disasters that occur make people panic and have no knowledge in the event of a disaster. In theory this is meant by disaster mitigation. Disaster mitigation is an effort to reduce disaster risk, either structurally or physically through physical and / or artificial or non-structural or non-physical development through increasing the ability to deal with disaster threats in coastal areas and small islands (Article 1 PP No. 64 of 2010) [16]. The number of casualties in the disaster this time shows that the public's unpreparedness in facing disasters, and the role of the government that is not optimal in carrying out dissemination of disaster mitigation to its citizens. This is in accordance with the findings that up to a week after the disaster occurred there were still many people who complained about the slow handling of the government. At least there are six steps that can be attempted in tsunami disaster mitigation [17]:

1. Make protection efforts to life, infrastructure and the coastal environment. The development of an early warning system and the construction of protective buildings are examples of safeguards that can be developed.
2. Increasing the understanding and participation of coastal communities in tidal disaster mitigation activities.
3. Improve community preparedness against disasters. This policy can be implemented in the following matters: the development of systems that support communication for early warning and emergencies, conduct training and simulation responses to disasters and damage caused, and disseminate information on stages of disasters and signs that accompany the occurrence of disasters.
4. Improve coordination and institutional capacity for disaster mitigation. The implementation of the fourth policy includes increasing the role and synergic cooperation of various parties.
5. Arrange an effective legal umbrella in an effort to realize disaster mitigation efforts, namely by drafting legal products that regulate the implementation of mitigation efforts, developing regulations and guidelines for planning and implementing disaster barrier buildings, as

well as implementing regulations and law enforcement related to mitigation.

6. Encouraging the sustainability of economic activities and improving the welfare of coastal communities through mitigation activities that are able to increase the economic value of the region, improve the security and comfort of coastal areas for economic activities.

Disasters that hit the city of Palu and several other Central Sulawesi regions showed that local government authorities also did not fully understand the flow and procedures for handling disaster quickly. When a disaster occurs, both the government and the community are equally unprepared. This can be seen from the results of the monitoring of the Partnership Team for Governance Reform in the Karajalemba Combined Command Post (Civil Society Coalition for Humanity) during the 10-19 October 2018 period. At the beginning of the monitoring period, assistance came from ministries / state institutions and non-governmental organizations came repeatedly and only concentrated in the yard of the Palu City regional government office [14]. The pattern of distribution of aid also seemed unprofessional, as seen from the recognition of victims of the disaster explaining that they had not received aid distribution until three days after the disaster.

Mitigation must pay attention to all actions taken to reduce the effects of disasters and sensitive conditions in order to reduce larger disasters in the future. Therefore all mitigation activities are focused on the disaster itself or the parts / elements of the threat. Some things for future mitigation plans can be carried out as follows [18]:

1. Location planning (land management) and population placement arrangements
2. Strengthen buildings and infrastructure and improve appropriate design rules (codes).
3. Conduct preventive efforts by reallocating high-area activities that are safer by developing microzonation
4. Protect from damage by making efforts to improve the environment with the intention of absorbing energy from the tsunami waves (for example by planting mangroves along the coast)
5. Socialize and conduct intensive training for residents in areas prone to tsunamis
6. Create an early warning system along coastal / urban areas prone to tsunamis

CONCLUSION

Based on the findings in the field, the FGD process with several related parties, as well as literature studies on disasters in the city of Palu and surrounding areas provided some important information that it turned out that the community did not have sufficient knowledge about disaster mitigation and preparedness in the face of disasters. In addition, the

government authorities also seemed panicked when the disaster occurred so that it was not optimal in providing services to the disaster victims. The huge number of victims is an indication of the unpreparedness of citizens and the government in facing disasters. Disaster mitigation policies should pay attention to all actions taken to reduce the effects of disasters and sensitive conditions in order to reduce larger disasters in the future.

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