

Community Vulnerability and Capacity of Local Government on Flood Control in Pasie Raya Subdistrict, Aceh Jaya Regency

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Abstract: Floods that hit several subdistricts in Aceh Jaya were caused by the inundation of Teunom River. Teunom River is one of the longest rivers in Aceh province. In order to assess the vulnerability of community in Gampong Pulo Tinggi to floods and the capacity of local government in flood control, a qualitative analysis was conducted by interviews, observations and Forum Group Discussion methods. The results indicate that the flood disaster occurred as a result of deterioration in environmental quality, namely the deforestation and the creation of embankments that has not been maximized. There are several precautions from the community to avoid greater losses due to this flood disaster such as making a house foundation that is higher than the ground surface, making the *pantee* where furniture is put in order to avoid being submerged, arranging the rice seed planting schedule agreed through the *kenduri blang* meeting. These precaution efforts carried out by the community, like *kenduri blang* and *tulak bala* become local wisdom which is the result of the ancestral inheritance in the form of ritual requests to God. Flood control by the government has not been optimal in terms of prevention such as embankment that need to be extended, tools during floods such as insufficient inflatable boats and Rapid Reaction Team that only consists of 20 people up until 2018 for the whole area of Aceh Jaya Regency.

Keywords: Community vulnerability, capacity of government, flood control.

INTRODUCTION

Aceh Jaya is one of the regencies that has a very high level of disaster vulnerability such as floods in Aceh province [1]. In recent years, natural and man-made disasters have shown an increase, both in characteristics and risks, especially in developing countries [2]. During the period of 2010-2014, the number of disasters in Indonesia reached 1,097 events, consisting of 1,124 natural disasters, 626 man made disasters and 157 social disasters. In 2014, the flood occurrences reached 88 events or about 19% of the total disasters that occurred in that year [3]. According to the National Disaster Management Agency, there are 23 provinces in Indonesia that are prone to flooding, with the top four provinces being East Java Province, Central Java Province, Aceh Province and West Sumatra Province. The indicator of the severity of the flood refers to the total area and the percentage of the number of events with the data as follows: East Java 36%, Central Java 21%, Aceh 11%, and West Sumatra 11%.

The annual flood phenomenon of *krueng* (river) Teunom currently occurs at parts of the river as follows. *First*, in the old estuary of *krueng* Teunom there is a sedimentation covering the river mouth. Flood happens due to the water debit that should flow to the sea, but it is detained and instead it returns to the area of village and national road. *Second*, at the upstream part of Teunom river located in Pulo Tinggi area, the earthen embankment has been eroded and unable to withstand river discharge, especially when it rains. And the *third*, when it rains, people's houses in Pasie Raya are inundated and all activities are stopped. Flood height can reach 3 meters, especially in *Gampong* (village) Pulo Tinggi [4]. The community is the one most heavily affected by seasonal changes and extreme weather, both by direct and indirect impact [5].

The regional government in this case the Regency Disaster Management Agency continues to work hard to reduce disaster risk in Aceh Jaya. Aceh Jaya Regency Disaster Management Agency is one of the government agencies established since 2010. With the implementation of Law Number 32 of 2004 regarding Regional Government and Law Number 33 of 2004 about Central and Regional Financial Balance, Regency / City are given authority to administer and promote their respective regions.

It is aimed to accelerate the realization of public welfare through services improvement, empowerment and community participation. The work procedures and organization of the Regency Disaster Management Agency (RDMA) are regulated in Qanun number 4 of 2010.

RDMA itself has planned a flood disaster management program in Aceh Jaya regency by making Annual Performance Plans target (APP) composed at the beginning of each year with agendas such as mitigation and rehabilitation. These programs include dredging the Teunom river mouth and constructing embankments in several villages. In addition to mitigation programs as above RDMA also performs emergency response actions such as providing inflatable boats during the flood and arranging public kitchens for the community.

Based on the description above, this study aims to determine the vulnerability of the community and government capacity in flood control in Teunom subdistrict, Aceh Jaya Regency. According to Twigg in [6] vulnerability in the perspective of community livelihood is based on five important elements, namely community capital, financial capital, social capital, natural capital and physical capital. Whereas the capacity of the government has a definition that is different from one expert to the other. According to [7] capacity building is a multi-dimensional study, it can be viewed from various angles, so that the definition is still difficult to obtain. In general the concept of capacity becomes a series of strategy, effectiveness, and responsiveness. Strong capacity that deals with disaster hazard is related to programs / activities to increase community capacity [8]. The main objective is enabling people to anticipate disasters, to be able to handle emergencies and be able to recover from disasters.

METHODOLOGY

This paper examines the vulnerability of the community and the capacity of community to manage floods in Aceh. In order to be able to answer the existing problems, this paper uses a qualitative method with explorative design. Pulo Tinggi Village, Aceh Jaya Regency is an area that is very vulnerable to floods, it is calculated from the RDMA 2012-2017 data, that there were 92 occurrences of flood.



Fig-1: Map of Gampong Pulo Tinggi
Source: Researchers' documents

The conception of informant selection began with understanding the condition of research locale, especially flood-prone areas. Therefore, the key informants are people who are vulnerable to flood and also RDMA employees who are the mediators in solving flood problems in Aceh Jaya Regency. Data collection techniques in this study apply four methods of data collection that are common for qualitative research, namely interview, observation and document and Forum Group Discussion. Observations are conducted to governments and communities whose daily activities the authors are involved with, as sources of research data. In-depth interviews were held to informants who in this case were divided into 2 types, namely: government such as social services, health services, RDMA, agriculture services and the community such as renowned figures from Pulo Tinggi village. In the FGD stage the researchers invited the community to make a village map and also a seasonal calendar and discuss vulnerability issues in Pulo Tinggi village by dividing them to 3 discussion groups, which consist of men, women and senior citizens. Researchers also used several documents from the RDMA that showed the number of occurrences and data from Aceh Jaya regency as input on how the vulnerability of the community to floods was. Data analysis was performed using triangulation of data from various data sources. It is said by Denzim [9] that triangulation can be done by using source, method, investigation and theory. In other words the data source obtained from the informant was reprocessed back along with the data obtained from other methods.

Community vulnerability

According to [10] vulnerability is a condition of a community or society that leads to or causes an inability to deal with the threat of danger thus in case of disaster, it will worsen the condition of community. In order to observe the community vulnerability to flood disaster, the causes of flood that occur in Pulo Tinggi will be described.

Table-2: Types of Hazards That Cause Flood in Pulo Tinggi

Causes	Results	Impacts
Deforestation	Erosion, reduced absorption, increased water velocity	Loss of livestock, houses are submerged up to 2 meters, the village becomes dirty, the emergence of disease outbreaks, increasing community activities,
Heavy rainfall	Increased water flow rate, trees and branches being carried away by water stream	
Insufficient length of embankments	The overflow of floods will inundate at the point where there is no embankment, the river water level is higher and very turbid	

Source: Research data 2018

According to the table above, the rate of deforestation in Aceh Jaya is one of the driving factors of the flood, in addition to the continuous rain [11] says that deforestation is a major cause of flooding in some regencies in Aceh including Aceh Jaya. One of them is the damage and changes in functions of the Gunung Leuser National Park (GLNP). Data presented by the Leuser International Foundation (LIF) shows that the findings of illegal logging cases in the GLNP area tended to increase in 2006 compared to in 2005. Besides the deforestation, post-construction phase of the jetty built in 2012-2013 also caused the community to be very vulnerable to flood that year. The Jetty made to prevent the silting or sedimentation at the river mouth which is related to the flood control in Aceh Jaya at that time actually backfired on the Aceh Jaya community. The reason is, during the process of Jetty construction, the local government installed embankments to facilitate the transportation of boulder stone, so the impact of the embankment is closing the outflow of water to the ocean which resulted in hundreds of houses residents were submerged by floods when the rain fell. The embankment temporarily made at that time was also considered by some party's accelerating the damage to the drainage basin of Teunom river. Moreover, when the jetty project had been completed, the boulder stones that served as pathway at that time were not dismantled by the government involved in making the jetty, it made the community more vulnerable to flood in 2014-2017. Less lengthy embankments are also a serious problem that must be addressed by all associated governments in Aceh Jaya.

Flood causes some community activities to be often disrupted, such as losses due to damage to rice plants because the duration of flood inundation made the rice plants perished. Economic and educational activities are halted during floods and it is also possible that there are various diseases outbreaks. Other impacts suffered by the community such as the loss of livestock becomes one of the factors of the worsened economy of community. Loss / dead community's livestock includes chickens and buffaloes. Both animals are the most domesticated by the people of Pulo Tinggi. After discussing with several Pulo Tinggi communities, 2015 and 2016 were the years when floods were the most severe in affecting people in Pulo Tinggi. The impact of the loss or even death of domesticated animals, especially the buffaloes owned by Pulo Tinggi people in 2015 and 2016 were not only caused by flood drifting the animals away, but partly due to the absence of grass to feed the buffaloes, which makes most buffaloes died.

Community Capacity on Flood Control

The capacity which is the opposite of vulnerability is the resource, the strength / ability possessed by the community so that they are able to survive, mitigate and recover quickly on a disaster event. In other words, capacity is positive aspects that can reduce risk by lessening existing vulnerabilities. As a flood-prone area, Aceh Jaya community have sufficient capacity to prevent more property losses. The first strategy carried out by the local community is to build a house of which the foundation is much higher than the ground level. Moreover, the people in Pulo Tinggi do not put a lot of furniture inside their houses because if the flood occurs, it will cost them a lot. They prefer to save money in gold and by expanding their land.

The second strategy used in Pulo Tinggi Village in order to reduce the risk of losses due to flooding is by making "*sandeng/pagu*"¹ and *kupok/keurepoh*². These two sections were deliberately made by the community to store

¹*Sandeng* is a storage place used by Acehnese community which is intentionally made to store things, *sandeng* is almost similar to the house platform in the present, the only difference is the platform is made of light material that is not strong enough to store heavy items, like asbestos or plywood, whereas *sandeng* is made of wood and it is given a small hole to put things on both during the flood and when unused items need to be stored. *Sandeng* is also a multifunctional place, besides serving as storage it can also serve as a platform. But nowadays it is very difficult to find a house that has *sandeng*.

²*Kupok* atau *Keurepoh* (rice barn) initially only serves as agricultural preparedness in the community agriculture. In order to keep rice remain in its storage area, the rice is placed in the Acehnese rice barn called *kupok* or *keurepoh*. For example, the picture above is a community rice barn which is made on a surface higher than the ground level to avoid soil moisture and also from flood. As shown by the image of the rice barn, it is used by the community not only for storing rice but also for saving goods during flood. According to the story heard long time ago, in ancient times in Aceh the rice barn was a sign of one's prosperity, the wise whether it was big or small indicated the prosperity of the owner.

things when the flood occurred. Rice cultivation that is still done in the fields makes Pulo Tinggi farmers also have their own way of anticipating and making things easier, by using traditional tools called *gukee kameng*.



Fig-2: *Gukee Kameng* and how to use it
Source: Researchers' documents

The traditional tools above are used by the Pulo Tinggi community to plant rice seed. The purpose of these tools is to make it easier for farmers to grow rice. How to use the tool is as follows, the grown shoots are placed on the tip of the appliance, and then the small seedlings of rice plant are put into the ground together with the *gukee kameng*.

Agriculture is not the only factor that causes people to be very vulnerable to flood in Aceh Jaya, property losses is also major factor that makes the community must be prepared for the risks resulted from the flood hazard. For instance, the damage to household furniture such as cupboards, cabinets and even electronic items such as washing machines and refrigerators. However, in this situation the community has a way to minimize losses such as making *pantee* as shown below.



Fig-3: A cupboard placed on *pantee* and *pantee* is stored
Source: Researchers' documents

In order to reduce vulnerability to flood, it is necessary to identify the factors that affect living conditions around the community. The aforementioned conditions are social, cultural, economic and environmental conditions. By understanding these conditions, the efforts to reduce vulnerability can be minimized. Furthermore, these factors are elaborated with local wisdom in the the community to reduce the community vulnerability to earthquake and tsunami disasters. In these factors, efforts to reduce social, economic, cultural and environmental vulnerabilities require an understanding of local values.

Local Wisdom On Flood Disaster Risk Reduction (DRR) In Aceh Jaya

There are two local wisdoms that have been carried out by the community to avoid disasters such as *tulak bala* and *kenduri blang*. These local wisdoms are not specifically related to disaster management, but are able to be used as a strategy to further optimize disaster risk reduction efforts. Disaster risk reduction based on local wisdom will be more

acceptable and easily adopted by the community because it correspond with the social and cultural conditions that exist in the community itself.

Tulak Bala

For the community that still hold most of the values of local wisdom, the implementation of the *tulak bala* or repelling hazard is still done out periodically. But, this has been very rare in Aceh Jaya. According to local figures in *Gampong Pulo Tinggi*, *tulak bala* is a futile act such as cutting the head of a goat or chicken and then throwing it to the river so it will be carried away. But not all people share the same view on *tulak bala*. For those groups in community who still perform the *tulak bala* ritual, this is a local wisdom that must be maintained because in *tulak bala* there are several values such as connecting people, reciting Al-Quran together and even doing Zuhr prayer together. In addition to strengthening a sense of kinship in one *gampong*, *tulak bala* is also an effort to anticipate disasters related to activities performed by the community.

The community in Aceh Jaya usually performs this ritual on *rabu abeh*, which is done at every turn of the year in Islam or 27 Safar (Hijriah). The goal is to avoid the disaster. Togetherness among the people is also created with this ritual. Usually rituals are carried out on riverbanks, the practice of *tulak bala* prayer involves a variety of elements including *tengku* (religious leaders), *keuchik*, *tuha peut* and the community of Pulo Tinggi village. *Tulak bala* (repelling hazard) was carried out with various series of activities such as reading the surah Yasin, praying that hazard will be repelled by providing offerings such as the head of a goat which is then washed away in the sea or in the river and then the activity ends with dining together. Basically the *tulak bala* ritual is part of the activities that combine religion and tradition. The introduction of disaster preparedness values in the *tulak bala* can be performed by the participation of community leaders such as *tuha peut* and *keuchik*. In the ritual of *tulak bala* messages or *haba* are inserted about ways of preparedness previously conducted by the ancestors. Likewise, in sermons the efforts to save one's life from the threat of disaster are included. Meanwhile, the village (*gampong*) authority holds a role in socializing disaster prevention efforts initiated by the government.

The description above is about *tulak bala* ritual that is only done by some people in Pulo Tinggi in the present. Some people consider *tulak bala* to be irrelevant at this time. *Tulak bala* is only an ancient ritual that connects Islam and Hinduism and the community considers it blasphemous. Changes in social values that occur in the *tulak bala* ritual include the community treating *tulak bala* as a recreational event with families and the young couples who have not been tied by wedding spend time alone on the banks of the river and beach. It is feared that the *tulak bala* ritual will be increasingly irrelevant to cultural values and will become extinct in the future.

Kenduri Blang

Kenduri blang plays an important role in agriculture in Aceh. In the villages or *gampong*, this instrument still functions to regulate planting seeds schedules and simultaneous farming procedures. For Acehnese people, agriculture is the culmination of all efforts [12] say, *kenduri blang* is a medium that aims to beg for salvation or blessings from God. Especially for people whose jobs are farmers, *kenduri blang* is a momentum to unite farmers in obtaining satisfying rice yields. Farming has a high value in the social order of Acehnese community and it has its own rules. Thus, one *Keujren Blang* who specializes in handling agriculture is appointed. *Keujren blang* is included in article 1 point 22 Qanun number 10 of 2008, which states that the *keujren blang* is the person who leads and regulates activities in the domain of rice field business. Besides *keujren*, in the *blang* feast the issue of deciding a good day and month to cultivate is also discussed. This matter in Aceh is known as *keunong* which is translated into Indonesian as 'being hit'. In farming, Pulo Tinggi community is always closely related to changes in weather and climate. According to [13] in determining climate change the Acehnese people view the natural phenomena and one of them is the encounter between stars or *kala* and the moon in the sky which is then known as *keunenong*. According to [4] there are 13 or 14 *keunenong* in a year, but in reality, the Acehnese people only know 1 *keunenong* in each month. Therefore, in practice, the Acehnese community only know 12 *keunenong*.

Some of the activities above are the discussions included during the *kenduri blang* ritual. The Pulo Tinggi community is a bit unique in terms of doing *kenduri blang*[14]. They perform rituals like giving food onto the rice seed they have planted. The ritual chronology is as follows, each of the households prepares 3 or 4 packs of cooked rice to be brought to the venue of *kenduri blang*. One of the packs they bring is set aside as the material for the ritual. The other cooked rice packages are collected into one container and then it is stirred properly. After that, the stirred rice are distributed to every persons in community who plants rice seed at that time. Then, that rice that have been set aside are scattered by the people in the cultivated fields where the rice plants grow. This is done so that the rice plants continues to grow healthy until the time of harvest arrives.

CONCLUSION

Flood will be a threat if it occurs in a vulnerable location. The Aceh Jaya community generally reside in regions prone to disasters. Teunom Subdistrict, which is the sample in this study, is located in the area around the Teunom River. Topographically, the upstream of Teunom River is generally characterized by hilly land, mountainous with steep cliffs and sharp slopes where large and small rivers flow. Meanwhile in the downstream, where the research takes place is a relatively low area so that it is often affected by flood disasters.

The community vulnerability in Teunom subdistrict to floods can be described as follows: the omission of an adequate embankment as river water retention when heavy rains occur, the unavailability of drainage channels in some flood-prone points, the lack of awareness among community about the importance of protecting the environment, such as the absence of reforestation on aged plants, the land-use change from agricultural land into construction land, and the activity of people cutting down forests which causes conflicts between wild animals and humans.

There are several ways in which people try to reduce the risk of losses due to flood such as building a house on a foundation higher than ground level, putting fewer furniture into flood-prone houses, and saving money in gold for some people who are regarded as middle-class. Based on local wisdom, the people still firmly hold the belief in the rituals inherited by their ancestors. In the agriculture sector itself, the ritual is known as *kenduri blang*. *Kenduri blang* aims to regulate the time for planting rice, in the *kenduri blang* people also discuss about strategies to get more crops, types of threats to rice and there are also prayers of hope for Almighty God, so that people are safe from all calamities. There are two other local wisdoms in Aceh Jaya, such as *tulak bala*, asking God to protect the community from all disasters.

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