

Build Settlements in The Tidal Flood Area: Learning From Fishermen Communities' Coping Strategies For Climate Change

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Abstract- Global warming and climate change cause some problems such as floods, droughts, storms, landslides and fires. Special problem in coastal areas is tidal flooding due to rising sea levels. This condition affects to the fisherman communities in the North of Central Java in building settlements and meets the needs of basic infrastructure such as water, waste water and garbage. This study aims to reveal more about how the fishing communities on the north coast to resolve the issue. Locus studies are in three settlements of fishermen in Semarang, Kendal and Tegal. The method used in this study is deductive qualitative rationalistic, with descriptive empiric analysis. From the results of a series of in-depth interviews, observation and empirical reduction, obtained several findings. First in building settlements: community will raise the floor elevation of buildings, roads and social facilities periodically; people use household garbage to raise the elevation of the land up to a certain height, and on the top of that area will covered with the soil; community use special foundation for their building construction with reinforcement material of bamboo. In the fulfillment of the basic infrastructure, people use dig wells, deep wells and buy water from water vendors circumference; community will throw garbage on the land pocket to be built or water body; and communities dispose of domestic waste both liquid and solid to the water body.

Keywords: Settlements, Tidal Flood, Coping Strategy and Climat Change.

1. Introduction

Global warming and climate change cause some problems such as floods, droughts, storms, landslides and fires. In four decades, natural disasters related to climate change such as floods, droughts, storms, landslides and forest fires have caused much loss of human life and livelihood, destruction of economic and social infrastructure also damage the environment. The frequency and intensity of dangers-this disaster is likely to increase. Flood and wind storm resulted in 70% of the total disaster and the remaining 30% due to drought, landslides, fire (Wiwik D and M Donny Koerniawan, 20014).

Especially in coastal areas, the most problem that arises is tidal flooding due to rising sea levels. This condition would affect coastal fishing communities in North Central Java in building settlements and meet the needs of basic infrastructure such as clean water, waste water and garbage. Various efforts of the communities who settle in coastal north of Central Java which can be identified by the researcher, when preparing several studies related to housing and settlements and settlement infrastructure on the year 2010-2015.

Among the many coping strategies for the tidal flood undertaken of coastal communities, there are efforts mostly less friendly to the environment. This is done in the community because of economic limitations, knowledge and awareness on the environment. This study aims to reveal more about how the fishing communities on the north coast to resolve the issue. Locus studies are in three settlements of fishermen in Semarang, Kendal and Tegal.

2. Literatures Review

2.1. Settlementnt

Settlements are a place (space) to live for human groups. The settlements also environment in which there are a group of homes have facilities. Settlements are a natural element of the environment (nature), human (man), society (society), facilities (shells) and infrastructure (networks). In more simple it can be said, that the settlement is a combination of elements from the human, natural, and built environment that consist of facilities and infrastructure. Infrastructure is meant here is the network that facilitates the relationships among and between the elements with each other, such as roads, drainage, waste water, waste and others (Doxiadis, 1971).

2.2. Coping Strategy

Coping strategies according to Folkman (1984) is the establishment of cognitive and behavior by individuals to manage the demands of pressure (internal and external) arising out of the individual's relationship with the environment, that is considered disturbing the limits owned by the individual, in particular relating to welfare. Coyne, et al (1981) suggested that coping is a good-faith effort cognitive or behavior that aims to manage the demands of the environment and the internal, as well as manage the conflicts that affect the individual that goes beyond the capacity of individual.

2.3. Climate Change

Climate according to the Departmen of Ecology state Of Washington is usually defined as the "average weather" in a place. It includes patterns of temperature, precipitation (rain or snow), humidity, wind and seasons. Climate patterns play a fundamental role in shaping natural ecosystems, and the human economies and cultures that depend on them. But the climate we've come to expect is not what it used to be, because the past is no longer a reliable predictor of the future. Our climate is rapidly changing with disruptive impacts, and that change is progressing faster than any seen in the last 2,000 years.

According to the EPA (Environmental Protection Agency), Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer. Climate change is a major disaster and a catastrophe for humanity, this is due to the impact of climate change for human life is very harmful at all. Global warming is causing climate patterns to change. However, global warming itself represents only one aspect of climate change (Environmental Protection Agency, 2015). Climate change is caused extreme weather. It is caused disasters such as landslides, storms hurricanes and floods. This disaster led to a lot of facilities and infrastructure damaged settlements in addition to drought, and many diseases.

3. Discustion

Northern coastal of Central Java's areas such as Tegal, Kendal and Semarang, are region affected by climate change. tidal floods often occur in this region. Usualay In the coastal areas inhabited by fishermen communities. That communities usualy are dominant with the poor comunities(low income). Many things were done fishing community to resolve this issue, with a very simple survival strategy within its capabilities.

The coping strategies to the tidal flood that they usualy do, are simple things that are not spend to much money. Some example of the coping strategies that they do and we can find are:

Strategy to prepare land to build house. Usually, they use garbage as embankment and for top they close with soil (Fig.1). They do it because the price one truck (3 m³) of soil is more than Rp. 800.000,- and they produce too much garbage but that communities are not serviced by garbage service.

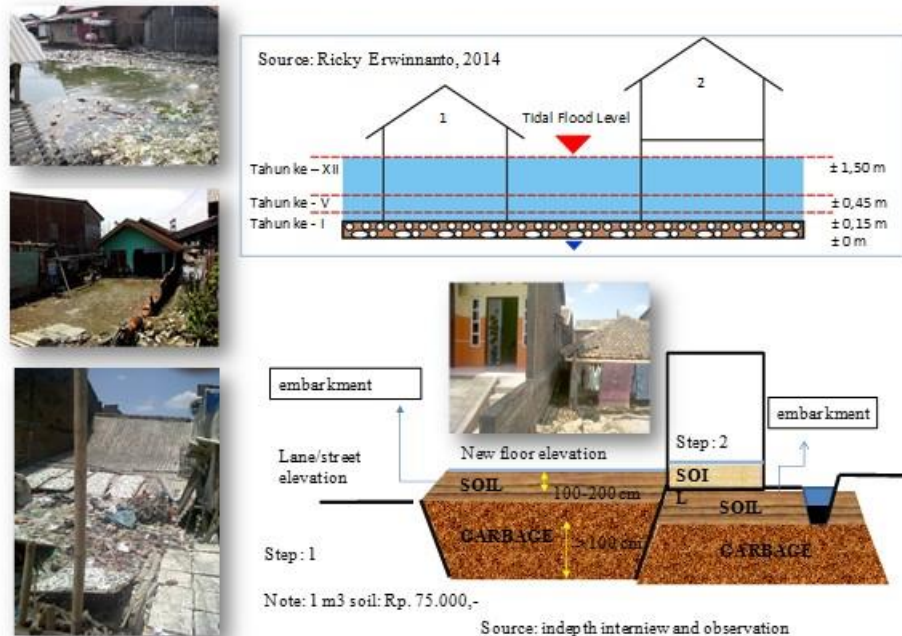


Figure 1. The Technical For Preparing Land To Build House
Source: Observation and in depth interview, 2015.

By using household waste as land filling material is certainly cause land to be rapidly declining. This condition makes people use bamboo as a material to make the foundation of the house. The bamboo material other than ringan also stronger compared to the iron that is easy corrosive if submerged in sea water. Bamboo will be stronger if submerged in water. For their wall-many already turning to wood to brick light (fig. 2)

1. Wall: wood, brick
2. Foundation: bamboo and concrete

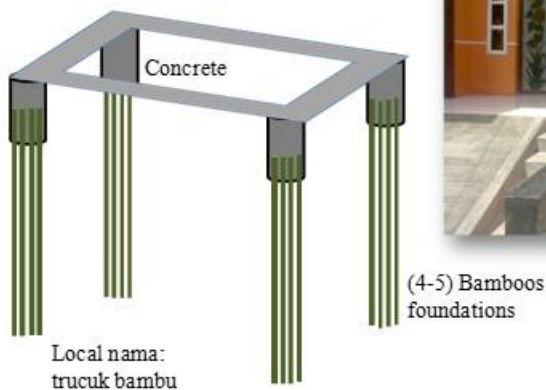


Figure 2. House Foundation
Source: Observation and in Depth Interview, 2015

Tidal flooding also causes roads often flooded and easily damaged. The condition of the land subsidence also exacerbating damage to roads, while communities also do not have the money to continue to improve the road. To overcome this, communities usually use bamboo as a material for building roads, especially in the event of tidal flooding. Bamboo is collated and bound on useless wheels. This construction they use as path (fig. 3).



Figure 3. Streets Construction
Source: Observation and in Depth Interview, 2015

Providing clean water is also a problem for fishing communities. Water from shallow wells have been not feasible used for bathing, cooking and washing or drinking. Water on the coast are usually salty, odorless and colorless / not clear. People usually only use this water for washing and bathing needs. For cooking and drinking they must buy from vendors or take away from the water depot that built by the government (fig.4).

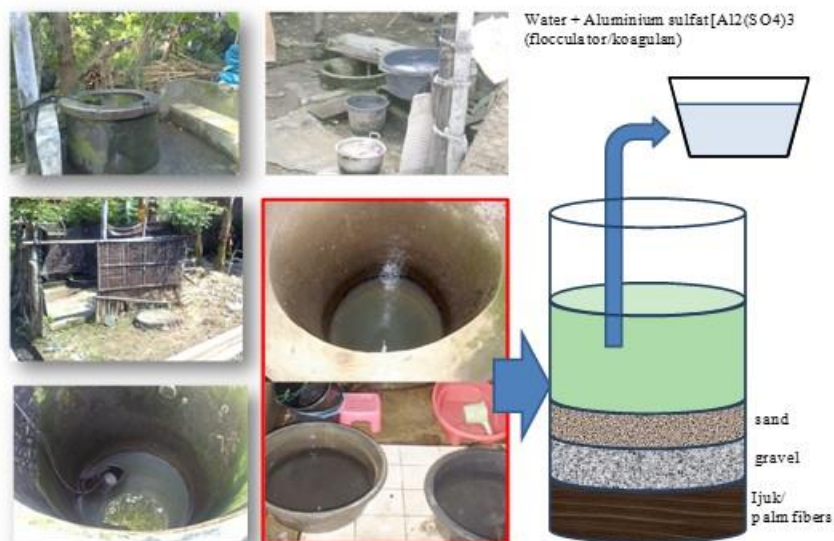


Figure 4. Streets Construction
Source: Observation and in Depth Interview, 2015

The increase in tidal flood also raise the ground water level. This condition would cause problems for people who use conventional septic tank because septic tank be easily filled with water and overflow, so it can not be used. Society does not have the money to build septic tank watertight. To meet the needs defecation, they usually use the open toilet along rivers, drainage channels, or by placing the faeces in plastic bags and dumped in vacant lots. This condition would cause residential areas become smelly and unhealthy (fig.5).

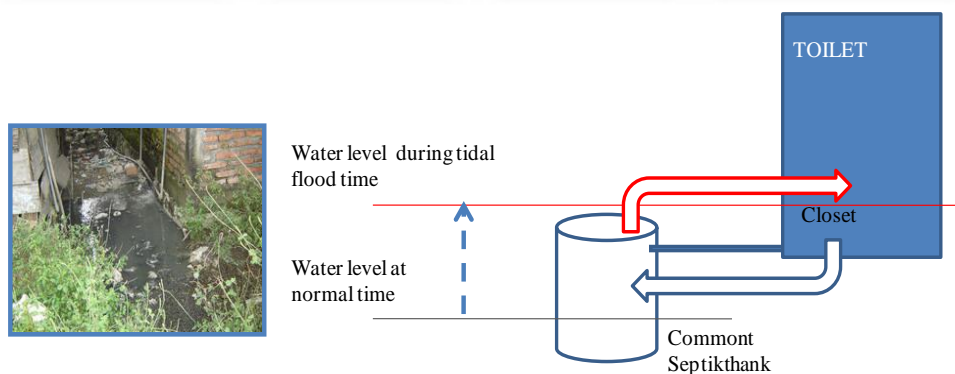


Figure 5. Out Door Toilet and Sapthic Thank Problem
Source: Observation and in Depth Interview, 2015

Fishing communities is also known as an apathetic society, who do not want to be bothered. They are different from the agrarian society that have to plant to get results. they are used to get the source of livelihood of marine resources that are already available without having to plant the seed. Beyond the fishing activities, much time they spend just to sit, to drink or to play dominoes or poker card. They rarely care about environmental issues. For those drainage full with garbage or clean are the same, so that this condition causes the environment are getting down and dirty (fig. 6).



Figure 6 Drainage Condition
Source: Observation and in Depth Interview, 2015

4. Research Findings

- 1) First in building settlements:
 - A) Communities will raise the floor elevation of buildings, roads and social facilities periodically;
 - B) Communities use household garbage to raise the elevation of the land up to a certain height, and on the top of that area will covered with the soil;
 - C) Communities use special foundation for their building construction with reinforcement material of bamboo.
- 2) In the fulfillment of the basic infrastructure:
 - A) People/community use dig wells, deep wells and buy water from water vendors circumference;
 - B) Communities will throw garbage on the land to be built or water body; and
 - C) Communities dispose of domestic waste both liquid and solid to the water body

5. Conclusion

- The conclusion as the result of the research are:
- A) poor fisherman communities are highly vulnerable to climate change;
 - B) many efforts made in the fishing community adaptation strategies in building settlements only for temporary and cause a lot of environmental problems
 - c) Prioritize adaptation efforts in fisherman communities where vulnerabilities are highest and where the need for safety and resilience is greatest
 - d) Prioritize the strengthening of existing capacities – among local communities, local authorities, and the private sector.

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