

ADAPTATION MODEL AFTER TSUNAMI HAZARD 1994 AT SOUTH BEACH EAST JAVA

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Submission date: 27-Mar-2023 08:38PM (UTC+0700)

Submission ID: 2048027601

File name: Adaptation_model_after_Tsunami_hazard_1994-2.pdf (636.89K)

Word count: 3917

Character count: 20685

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To cite this article: Ketut Prasetyo 2019 *IOP Conf. Ser.: Earth Environ. Sci.* **314** 012025

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Adaptation model after Tsunami hazard 1994 at South Beach East Java

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Abstract. Beached South of East Java passed by tectonic plate have tendency become area which trend of to tsunami disaster. Phenomenon the happening of year tsunami disaster 1994 which have swallowed good victim of soul and also estate do not cause to discourage in as resident to linger on the in place. Tsunami as source of pressure adapt environment live beached resident Beached South of East Java likely not yield is same response sort of environment. On that account, passing approach qualitative and is quantitative of researcher wish to know adaptation strategy model used by resident in Beached South of East Java Province. Research method by use facto expose method, while to collect data by porpositive sample technique. The result of the researched hence known that environmental adaptation strategy model at Beached South of East Java after tsunami disaster, that is: First of Pancer model, model Pancer distinguish that its resident stand at bay and back to environment of is ex-tsunami disaster, them believe the happening of eye tsunami disaster because God destiny. Second of Lampon model, characteristic model Lampon differ from characteristic model Pancer. At Lampon model, Tsunami pasca resident leave environment which have swallowed victim, their have of migration to in more peaceful environment. Third model Watu-Ulo, at this model of resident remain to live location but they try to make barrier dam in the form of fence and croopes. Gift of is name of model like Pancer model, model Lampon, and Watu-Ulo model is the name of model which pursuant to coastal environment or location the happening of tsunami knowledge of Resident about very low tsunami later then new tsunami disaster is once experienced of by resident and also mount trust that tsunami disaster is Destiny Which Single The most, hence third this matter equipment Coastal resident characteristic of South East Java in adapting with environment Conclusion result of research is resident response in Coast South East Java differ in accepting and avoiding tsunami disaster, while environmental adaptation model at Lampon society assessed by most peaceful. So that given suggestion that for the resident of as in Pancer and Watu Ulo is immediately given by counselling to increase awareness of resident about level of danger which possibly will befalling it, and also give training of is way of facing tsunami disaster if in a moment happened.

1. Introduction

The tsunami originated from the word Tsu means the place where the ship docked and nami was a wave. Thus, the Tsunami is defined as a natural disaster in the form of waves of sea water that befall the environment where the ship is anchored. In English literature Tsunami is sometimes referred to as tidal wave, and is often translated literally as "tidal wave". This term is actually less precise because it has



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absolutely no connection with the tides of the sea which is generally determined by the attraction of astronomical objects. In contrast to the waves generated by the wind which only moves the upper sea water. Tsunami waves cause motion in the entire water column, from the surface to the sea floor.

According to RP Corner (1981) in Saroso BS (1996) that based on the source Tsunami can be divided into three, namely: (a) Tsunamis generated by the tectonic earthquake of the ocean floor plate; (b) Tsunamis generated by volcanic activity under the sea volcano; and (c) Tsunamis generated by avalanches on the seabed. Furthermore, it was emphasized that almost 95% of the Tsunami events were due to the tectonic earthquake of the oceanic base plate and until now it has not been predicted when or when the Tsunami will hit an area.

Relating to the position on the active volcanic pathway, historical records of Tsunami disasters often hit the coasts of our country. Since the eruption of Krakatoa in 1883 more than 30 disasters have been recorded. Based on the records of the Meteorology and Geophysics Agency (BMG) that an average of 460 earthquakes a year were recorded in Indonesia, approximately 70% were tectonic earthquakes originating from the seabed which could potentially cause a Tsunami.

The South Coast of East Java is a part of the coastal environment adjacent to the Indian Ocean tectonic plate lane and one of the coastal environments in Indonesia that was hit by the Tsunami disaster, especially in 1994 which has brought many victims of property and lives. Furthermore, according to the records of the Research and Development Agency of the Ministry of Public Works that the victims of property and lives as a result of the 1994 tsunami were as follows: 238 deaths, 15 missing, 789 injured, 992 damaged houses, 340 missing boats. Wave height and range of Tsunami to land in 1994 in the South Coast area of East Java are in Grajagan (Banyuwangi) 6.9 meters high and a range of 300 meters, in Lampon (Banyuwangi) wave height of 11 meters and a range of 300 meters, in Pancer (Banyuwangi) wave height of 11 meters and a range of 300 meters, in Rajegwesi (Banyuwangi) wave height of 14 meters and a distance of 150 meters to the coast, in Watu Ulo (Jember) wave height of 5 meters and a range of 500 meters, in Tambakrejo (Malang) wave height of 4 meters range of 50 meters while in Sine (Tulungagung) wave height of 6 meters with a range of 50 meters. But it seems that the Tsunami disaster has claimed many victims: property, objects and lives did not dampen the guts for residents on the South coast of East Java to remain in the neighborhood.

Against the background that Tsunami disasters are difficult to predict when they occur, and if they occur, they can result in victims of considerable wealth and lives, so with the knowledge that there are still many people who remain in an environment that are classified as vulnerable to Tsunami, it is interesting to reveal how environmental adaptation strategies of a community south coast of East Java. In relation to the discussion of the environment, it is necessary to understand the existence of the Environmental Paradigm Scale paradigm [1]. Broadly speaking, it is understood that New Environmental Paradigm (NEP) is a view that basically places humans' part of the ecosystem, and humans are closely related to the life of the entire cosmos. So, the NEP hopes humans think dialectically. Natural wealth and sustainability of it carrying capacity are always associated with human ecological responsibility and awareness. Thus, it can be understood that the NEP concept basically states that humans are part of their ecosystem and are not separate parts of it.

Regarding the study of cultural and environmental relations there are several views. First-view of deterministic anthropogeography. This view states that the environment can determine culture. The culture that develops is determined by the environment. The environment in question is a natural environment such as climate, soil and topography of Meggering in Sukadana [2]. As part of the ecosystem, human existence is influenced by the environment, such as geography and climate. Different geography and climate cause different patterns and human behavior. People who live in mountainous areas have a different lifestyle than people who are high al in the coastal area. Second possibility. According to this view the environment does not absolutely determine the characteristics of culture, but only provides possibilities that are characteristic of culture. Differences in geographical conditions are only a source of cultural variation. This view is not completely wrong. Many regions have the same physical condition, but the culture of the community is different, as the culture of the Gunung Kidul community in Yogyakarta is different from the Majalengka community in West Java. This can be

assessed from the results of research on environmental compatibility by MKLH as cited by Warsono [3]. Third, the view of cultural ecology was initiated by Steward [4]. According to Steward, there is a relationship between culture and environment [4]. This relationship is seen in economic activities, especially in the production sector. Humans must initially adjust to the environment, by developing a culture in harmony with nature. According to Steward culture is not only determined by the environment, but also a creative process in which there are levels in adaptation [4]. The fourth view of cultural ecosystemicism proposed by Clifford Geertz [5]. This view actually has similarities with Steward's view. The difference is that Geertz emphasizes balance. Geertz stressed that the relationship between humans and the environment is a relationship of interdependence [5]. Therefore, humans must always create and maintain new balances on the environment [6]. According to the results of Geertz's research, it is known that in Indonesia history and politics are factors that determine human adaptation to the five-view adaptive dynamic environment developed by John Bennet [5]. This view still recognizes the existence of human and environmental relations, as well as changes that occur as a result of these mutual relationships. Therefore, humans must adapt. In the process of adapting to these changes, humans have choices, even though the choice contains a problem. Related to environmental adaptation there is a theory put forward by Bell [7]. A model of interaction between individuals and the environment that involves perception, coping, and cumulative effects. A person's perception of the environment is derived from objective physical conditions and individual differences. The perception of the environment produces an optimal stimulus which ultimately forms a homeostatic, and environmental perceptions appear as optimal limits. Furthermore, stimulation of perception of the optimal range causes stress, or overload and or reactants. Then someone will be coping, if successful will do adaptation or reinforcement, whereas if not successful, pressure (arousal) or stress will continue, and finally will produce cumulative effects. First and second views are more linear by placing the environment as the main cause of a culture. Both of these views do not see any influence between the environment and culture. In the third and fourth views, the recognition of the interplay between environment and culture is acknowledged. Stewards have also shown how human adaptation to the physical environment has influenced cultural characteristics, but Steward's shortcomings do not talk about how the process of mutual influence between culture and the environment and how humans develop new cultures and are related to environmental change [4]. The view of the relationship between culture and environment turns out that Bennet's view is more complete when compared to other views. The reason used to assess the completeness of the relationship model is adaptive dynamics, in addition to a systemic concept, which also includes the process of behavioral adaptation, decision making and choices that are indirectly under regular process control. Adaptive dynamics emphasizes the element of possibilism which is ignored by ecosystemics and also the element of choice of human actions which is ignored by Steward [4].

2. Objectives of research

Research Objectives: 1. Knowing about Tsunami disaster, 2. Knowing the model of environmental adaptation after the Tsunami disaster, and 3. Evaluating the model of environmental adaptation carried out by the people of the South Coast of East Java after the Tsunami disaster

3. Research methods

The method the researched is exposure facto, and using quantitative and qualitative approaches. Quantitative approaches are used to obtain data: the distance of the population's residence to the coastline, the form of the settlement layout. Whereas a qualitative approach to uncover community knowledge and perceptions of Tsunami disasters.

4. Result of the researched

4.1. Knowing about Tsunami disaster

Referring to the results of the study that the level of education of the population is relatively low, and their knowledge of tsunami disaster is low, the condition of the population like this causes obstacles to realizing or changing attitudes and behaviors in dealing with the disaster.

Based on the results of interviews with some people who had been hit by the Tsunami all explained that their knowledge of the Tsunami did not yet exist. Even the term Tsunami was only known after the disaster in 1994 ago. They do not know the origin of the cause of the Tsunami.

Despite the Tsunami disaster in 1994, it turned out that the attitudes of the community towards the location of their settlements that were vulnerable to Tsunami disasters were differences between the people in Lampon Beach and Pancer Beach.

Broadly speaking, the characteristics of the people of the South Coast of East Java who had been affected by the Tsunami were mostly embraced Islam, the level of education that had been taken by most had finished elementary school, and most of the livelihoods were fishermen.

In relation to the culture that is owned, the South Coast community has traditional "*sedekah laut*" ceremonies and they have confidence in the existence of "*Nyai Roro Kidul*" as the South Sea India Ocean. As traditional fishermen, they have knowledge of the existence of the "Southwest Season" danger that occurs from December to March. According to them, during the months they were forced to take a break, they did not go to sea because in that month there was a big wave and fish famine occurred. Most of the settlements that have been hit by the Tsunami disaster are located in tidal areas.

Resignation, relying on natural conditions, the phenomenon of population like this is what we need to increase their knowledge. They need to be developed to try / out to get out or overcome problems that are expected to occur.

4.2. Model of Enviromental Adaptation After the Tsunami Disaster

Model adaptation of the environment of the South Coast of East Java, especially in the coastal communities that have been hit by the Tsunami disaster can be divided into three model : 1).the Pancer model is remain in a location that was hit by the Tsunami with submission, 2). the Lampon model is moving safer residential locations and 3). the Watu-Ulo Model is making protection.

a. The Pancer Model

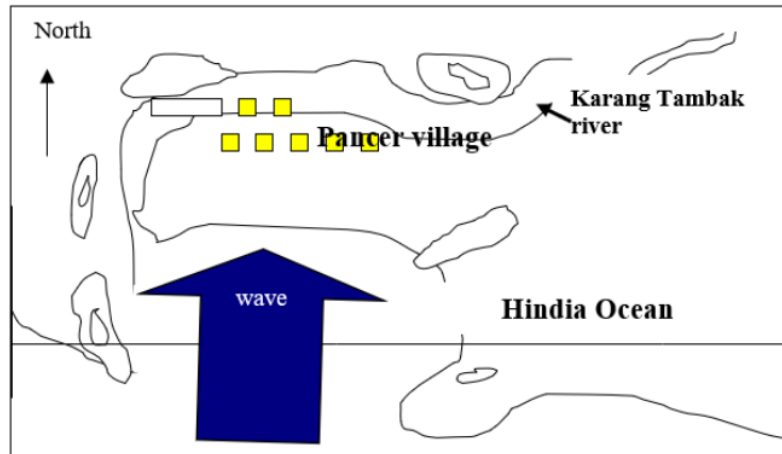


Figure 1. The map of Pancer Beached. The setlemen in Pancer Village at the open beached.

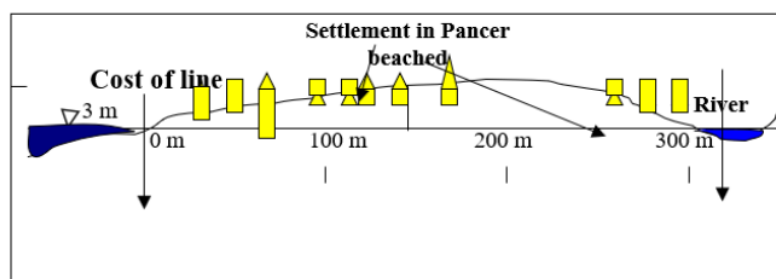


Figure 2. Profile of settlement at Pancer village, Banyuwangi district

Based on Figures 1 and 2, it is known that the model of spatial settlement in Pancer Village on the vulnerability of Tsunami disasters is the highest. Because the resident houses in Pancer Village directly face the open beach so that in the event of a Tsunami there is no barrier and immediately hit the settlement. In addition, with settlements located on the open bay-shaped beach, in the event of a tidal wave or Tsunami, there will be an accumulation of tide in the bay.

The 1994 tsunami disaster that occurred in Pancer Beach with the death of 120 dead, 526 injured, 704 houses damaged and 200 damaged and missing boats did not seem to be a meaningful lesson for the people in Pancer village. They were back again in the location that had claimed the victim in 1994. The perception of the population in Pancer that the tsunami disaster was God's destiny, so that if Tsunami happened again they resigned, did not have the knowledge to deal with it

b. The Lampon Model

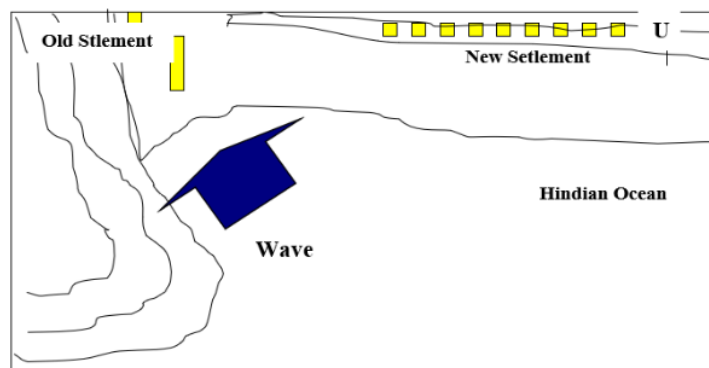


Figure 3. The Map of Lampon Beached. Shown is old settlement and new settlement after tsunami hazar

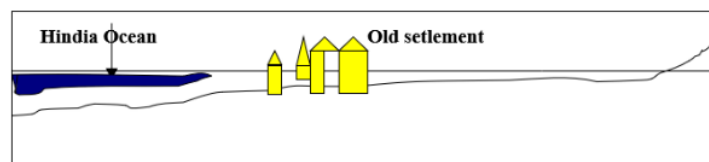


Figure 4. Lay-out of Old settlement at Lampon Beached, Banyuwangi Distri

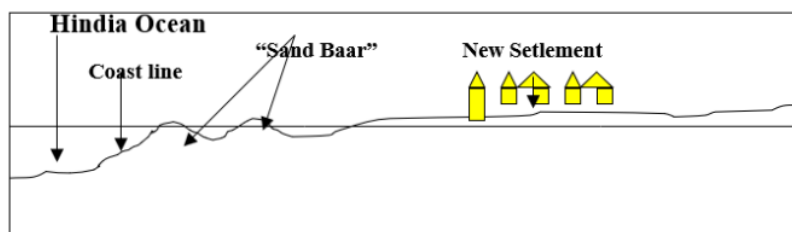


Figure 5. Lay-out of New Settlement at Lampon Village, Banyuwangi District

The form of the beach in the form of an open bay as can be seen in figure 4 causes the tidal wave to directly hit the beach. This condition is similar to Pancer Bay. But in adapting to the environment after the Tsunami there are differences. If in Pancer the population chooses to stay / return to live while the coastal lampon community chooses to move in a location that is considered safe from the Tsunami.

c. The Watu Ulo Model

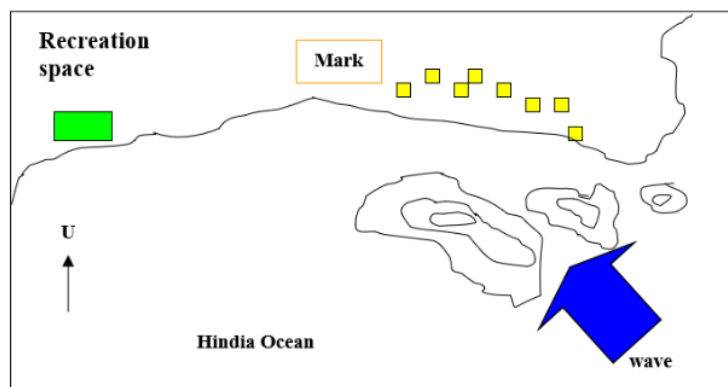


Figure 6. Map of Watu Ulo Beached- Jember District

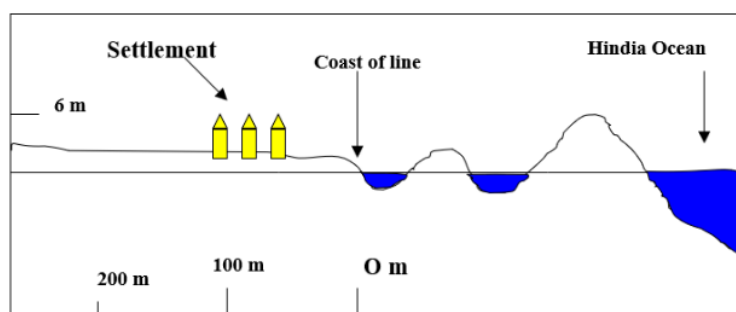


Figure 7. Lay-Out of Settlement at Watu Ulo-Jember District

5. Evaluating the model of Environmental Adaptation

The Tsunami safest adaptation model referring to the environmental adaptation model in the communities of the South Coast of East Java after the Tsunami, it is known that the safest adaptation model is the adaptation model as practiced by Watu Ulo Beach community. Then the next allater is the adaptation model in the Pesanggarahan beach community.

As in the case in Pancer and Lampon. In both environments even though both victims and property have fallen, but the Pancer population showed little phenomenon that is different from the population of Pancer who remained settled and carried out economic activities in the location, while in Lampon the location of the former disaster was only used by economic activities namely the port fish catcher.

Phenomenon in Lampon and Pancer proves that the basic needs of employment will override the dangers that always threaten the body and soul. In New Environment Paradigm, the joint economy is a decisive component in quality environmental management. So that at the same time this implies that the economic phenomenon of the population is low, their lives depend on environmental conditions.

Population trust in the research area that the tsunami disaster is the destiny of God Almighty, then this phenomenon seems to identify that the character of the South Coast of East Java population in adapting to the environment was revealed by Chiras who said: "environmental disaster let it happen, then naturally natural will improve it self ." [8]

Population patterns cluster in the coastal plain. Despite the Tsunami disaster in 1994, it was evident that the attitudes of the community towards their settlement locations were vulnerable to Tsunami disasters, there were differences between the communities in Lampon Beach and Pancer Beach.

The people in Pantai Pancer returned to occupy settle in locations that had been hit by the Tsunami, while the Lampon Beach community after the Tsunami disaster largely left their settlements that had been the Tsunami disaster. The reasons put forward by the Pancer beach community to stay in the location because of the Tsunami are disasters and God's destiny, so that if a disaster happens later it is God's destiny too. Whereas the reason stated by the Lampon beach community to move or leave the former site was hit by the Tsunami because the people felt traumatized by the disaster. Conceptually, if we use the theory of environmental psychology, as revealed by Bell, the people on the Pancer coast are not stressed by the Tsunami disaster stimulants, they can copy the Tsunami [7].

The situation is different between the Pancer beach community and the Lampon beach community in receiving Tsunami disaster stimulants. At the Lampon beach community there was a post-Tsunami stress. Therefore they did not want to resettle in locations that had been affected by the Tsunami.

We can observe different environmental adaptation models in the community at Watu Ulo Beach. In both coastal locations the community environmental adaptation model adapts natural conditions to protect from Tsunami disasters. Whereas in Watu Ulo Beach in an environment of adaptation so as not to be affected by the Tsunami in addition to adjusting the natural conditions, they also made retaining waves in the form of artificial likes planted with trees

6. Conclusions

Based on the results of the research can be concluded as follows:

1. The level of education of the population is relatively low, and their knowledge of tsunami disaster is low, the condition of the population like this causes obstacles to realizing or changing attitudes and behaviors in dealing with the disaster.
2. Model adaptation of the environment of the South Coast of East Java, especially in the coastal communities that have been hit by the Tsunami disaster can be divided into three, namely: the Watu-Ulo Model (making protection), the Lampon model (moving safer residential locations) and the Pancer model (remain in a location that was hit by the Tsunami with submission) Variations in the model of environmental adaptation are made possible by the Tsunami events they have only experience
3. Based on the evaluation results of the environmental adaptation model, the Lampon Model is the safest, while the Pancer model which is considered the most risk if there is a tsunami disaster again

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