

Identification of Coastal Problem along the East Coast of Lampung Indonesia

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Abstract: The dynamics of nature occurring in recent years, as well as climate change and the increasingly severe pressures of humans have had a noticeable impact on the coastal conditions. This research aims to present the results of identification of various damages that occurred along the East Coast of South Lampung Regency of Lampung Province with the method of field surveys through observation, measurement, study of supporting data and previous research. This study was conducted with several activities, namely field observation, interviews and documentation of conditions for damage to coastal areas. The final result of this identification is to describe: (a) the type of damage occurring; (b) Cause of damage; (c) The impact of any damages incurred; (d) Alternative countermeasures; and (e) The location coordinates are damaged. The results showed that the sedimentation process and damage to coastal structures occurred at the location of Ketapang Laut village. Sedimentation also occurs in the estuary of Ketapang Laut village of South Lampung to cause the presence of land arises, the sediment of river estuary and the coastline. Another problem is the decrease of mangrove forest area which is one caused by the opening of the area to be used as shrimp pond.

1 INTRODUCTION

The problem of coastal areas is a condition that inflict damage to coastal areas caused by natural processes or caused by human activities. The factors that cause damage to coastal areas can naturally come from the influence of the hydro-oceanographic processes occurring in the sea that can cause waves to wave, resulting in sedimentary transport, changes in current patterns, tidal variations, and climate change (Fadilah et al., 2013).

Some locations along the coast are damaged, especially in physical forms such as coastal line changes, either abrasion/erosion and accretion/sedimentation. East Coast of South Lampung Province is one of the coastal areas that is not separated from the general problems of the beach is erosion and sedimentation. The change of coastline is a process that lasts continuously through a variety of processes both erosion (abrasion) and additions (accretion) resulting from the movement of coastal sediments, longshore current, wave action and land use (Arief et. al., 2011).

Coastal erosion is a result of human activities and natural environment changes making the coastal

dynamic action (wave, current, wind) lose balance in the coastal process, and the long-term loss of sediments of coastal zone results in the destruction process of coastline retreat and beach erosion (Yin-can, 2017). Accretion or sedimentation is the siltation or addition of coastal land due to the deposition of sediment brought by sea water. The sedimentation process can take place naturally from the sedimentation process and freshwater flow, as well as those caused by land-based human activities such as deforestation and pollution. Moreover, accretion can also harm the coastal community, because in addition to influencing the stabilization of the coastline, accretion can also cause the traffic to the river estuary where the ship and the boat.

Coastal damage can be assessed objectively by using special criteria for coastal damage assessment. Based on the SE KEMENPUPR No. 08/SE/M/2010 it is written that the criteria of damage to the coast used is divided into 3 (three) kinds such as the criteria of coastal environmental damage, erosion criteria and building damage and sedimentation criteria.

This research aims to present the results of identifying various damages that occurred along the east coast of South Lampung Regency with the

method of surveying the survey through observation, measurement, study of supporting data and previous research.

2 METHODOLOGY

The data collected consists of primary data and secondary data. Primary Data was obtained using a survey method through field observation, deep interview with several respondents selected purposive and incidental at the location of coastal areas and damage documentation along the coastal areas. The data collection instruments used in this study are questionnaire, interview guidelines and cameras. Secondary Data is obtained using the literature study method.

The scope of the damage surveyed is all damages in the east Coast region of South Lampung Regency Lampung Province which can be observed and identified directly without requiring advanced analysis/analysis of laboratories (in this case the survey conducted excluding underwater ecosystems such as coral reefs and seagrass).

A large survey conducted to observe the damage occurring along the coast, especially the region in the coastal areas in South Lampung regency. The final result of this identification can describe: (a) the type of damage occurring in an area or coastal location; (b) Causes of damage in an area or coastal location; (c) The impact or consequences of any damage incurred in an area or coastal location; (d) Damage/rehabilitation alternative to damaged coastal areas; and (e) the location of details (location coordinates) of the coastal areas that have been damaged. To analyze the data already obtained used a descriptive analysis method.

2.1 Area of Study

This research was conducted along the east coast of South Lampung Regency, Lampung province. Live observation at the research site is done by going down the east Coast along ± 17 km in 1 (one) sub- district that is Ketapang which is one of the sub- district close to the access to the road of Bangun Rejo, shown on Figure 1.

2.2 Field Surveys

Collection of research data was conducted in May 2019 by walking through the beach using GPS, digital photos, and video cameras as well as conducting an interview method directly with the community in the



Figure 1: Area of study.

settlement along the coast. The results of this observation are also supported with secondary data in the form of the previous research, namely hydro-oceanographic data that includes wind data, wave data, sediment data, bathymetry data as well as various maps and other data needed as map topography, administration, land use, population data and so on that has been obtained from related agencies.

3 RESULTS

The process of sedimentation and damage to this coastal structure occurred at the location of Ketapang Laut village. The location of the sedimentation beach is one of the locations that belong to the East Coast region of Lampung province South Lampung and is located at the location of the coordinates $5^{\circ}44'26.05''$ S and $105^{\circ}47'48.21''$ E shown on Figure 2.

Based on information obtained from the previous study obtained information from the Pekerjaan Proyek Pesisir (1998) that the beach is experiencing sedimentation process and this process tends to be found many along the east Coast region of Lampung province. This is because there are many large river estuary along the coastal areas so that the source of sediment comes from the mud that is carried away from the upstream area and precipitates in the estuary.

In addition to the sedimentation problem the field survey results also showed that the sedimentation process that occurs constantly causes damage to



Figure 2: Sedimentation and coastal structure damages.

coastal structure. This type of coastal structure is revetment. Revetment is a coastal structure that is built on coastline and is used to protect the coast of Dai wave attacks and runoff waves (overtopping) to the ground (Triatmodjo, 2012). Revetment has a sloped side and can be made from a pile of rocks or bronzes, making it more flexible and adapts to the scours at the foot of the building. The revetment that functioned as a coastal protective structure was damaged because of the buildup of sediment in the concrete pile that formed the presence of new land. If it is reviewed based on the characteristic of the east coast of Lampung province that has the same characteristics as the north coast of Java (Sulaiman, 2018) that the coastal area is characterized by the low slope of the mud and swamp overgrown mangrove and has a very fine grain size, it is very possible once the dominant sedimentation process occurs in this location. The condition of the beach with muddy characteristics is also very related to the wave energy is very low, but the tide is greater. Based on the results of the research conducted by Tarigan et al. (2020) that the East Coast of South Lampung has a characteristic wave height which ranges from 0.36 m-2.57 m. East coast of South Lampung Regency that has a character sedimentary mud affects the sediment process that tends to undergo sedimentation process in the coastal area (Tarigan et al., 2020).

The process of in the village of Ketapang Laut South Lampung District, this led to the presence of land arising causing the increase of river estuary and the coastline. The ignition of the estuary that occurs can clog the stream, pollution, the fishing vessel traffic at low tide and on the other side when the tide can cause the widespread water over the bank.

People in the village of Ketapang Laut South Lampung District overcome the blockage of the river by doing simple dredging such as making a hole that



(a)



(b)

Figure 3: (a) and (b) Sedimentation.

functions to drain the flow of the river to the beach that shown on Figure 3(a) and Figure 3(b).

Based on the condition of the field obtained information that if not in the rainy weather conditions, the river discharge is relatively small so that the current speed is not able to erosion. The deposition to a clever consequence of the river estuary completely covered sedimentary deposits.

This location is very close to the residential area of residents and also the processing place of salty fish that have waste, under certain conditions some residents who live around the area is disturbed by a puddle that sometimes carries a waste of salty fish processing that creates unpleasant odor so that the citizens will be able to join the place in the mouth-mouth of the river, especially the stream is small.

To solve the problem, it is necessary to do the treatment to take the entry of sediment to the estuary of the river. The bank's estuary management strategy can be determined where the sedimentation of the

river mouth is the simplest and least inexpensive alternative handling (Triatmodjo, 1999). Dredging can be done at the beginning of the rainy season, either by mutual assistance by local residents or by using the help of heavy equipment if possible in the way of inspection. To get the maximum flow, a large volume of dredging is required. The difficulty of this alternative is the re-enlarger groove that is completed scraped, especially when the wave with greater energy and also if the interval between the completion of dredging with the advent of the first flood is still long enough, so that the groove that has been dredge will be closed back by deposits. Triatmodjo (1999) states that when dredging is done by mutual assistance, the population can choose the thinnest and most narrow deposits to be scraped on downstream turns. The purpose is the River estuary remains turned, so the discharge capacity of the addressing is reduced.

The decrease of mangrove forest land cover that occurred in the coastal area East coast of South Lampung district is at the coordinates of $5^{\circ}39' 48.76''$ S – $105^{\circ}48' 41.48''$ E. Based on the results of field surveys and interviews with local residents, one of the causes of damage to the mangrove forest is caused by the opening of the area to serve shrimp ponds. The field conditions taken in May 2019 are shown shown on Figure 4.

Based on the information quoted from previous research according to resource Atlas of Lampung coastal area (Wiryawan, 1999) coastal area along the coast of East Lampung except Way Kambas National Park occurs the change of land that initially swamp and mangrove forest into rice farming land and shrimp pond. The existence of mangrove forest covering about 81 percent of the beach in Lampung, can provide many benefits, both physically, biologically and economically. But excessive utilization especially on economic utilization can cause damage to ecosystems. However, if the land cover area of mangrove forest will be held continuously, it can cause impact on coastal area and beach.

Some of the impacts that can occur are coastal erosion and river borders, sedimentation, environmental pollution, decline in ecological function that will affect the economic aspect especially for fishermen who are in the East Coast district of South Lampung Regency and will cause sea water intrusion. Policy recommendation to improve the mangrove ecosystem and reduce the impact is to rehabilitate the mangrove ecosystem by actively involving the community.



(a)



(b)

Figure 4: (a) Mangrove forest area; (b) land conversion.

4 CONCLUSIONS

East Coast of South Lampung regency, Lampung Province showed that there are coastal damage that occurred at some point of location and need to get handling to do ecosistence improvement of coastal area and integrated beach. The location that is experiencing the sedimentation process is a location that affects increasing the economy of the local population working as fishermen and entrepreneurial fish processing.

East Coast of South Lampung regency, Lampung province problem is caused by natural and anthropogenic factors. Natural factors in the form of hydro-oceanography can damage ecosystems and buildings on the coastal borders. Factor anthropogenic by community activities that do not comply with local regulations and rules applicable.

Advanced research and studies need to be done to support the results of the Identification of Coastal

Problem along the East Coast of Lampung Indonesia by conducting a coastal protection analysis in accordance with the principles of integrated coastal management.

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