

# **Delta Preservation and Handling Diversion Abrasion Coastal Model of The Sudeten Wulan River (Case of Study in Land Arising Coastal Wedung, Demak, Central Java)**

**Fatchur Roehman, ST. MT**

Faculty of Engineering, Sultan Fatah University (UNISFAT)  
Jl. Diponegoro 1B Jogoloyo Demak, Jawa Tengah, Indonesia  
faturroehman@yahoo.com

**Abstract**-The research makes the preservation of coastal security models in land development arose as an effort in face the impact of reclamation Marina Beach Semarang in the way making the Sudetan Wulan Beach and security of Semat Beach district of Jepara. The method used is the field survey method using the instrument as a guide in-depth interviews, direct observation, calculation of sediment and documentation. Sources of information from the local public and government. Triangulation techniques implemented in collecting the data. Meanwhile, in reducing data from public aspirations used Focus Group Discussion (FGD) Method. The data analysis was performed by observing the increase of land arises, quantitative and qualitative approach. Based on the result of analysis seen that the disaster in the coastal abrasion in Demak and Jepara is getting worse in Babalan Village, Wedung Regency. The effort that people do in face the abrasion in the area by making sudeten to right side in Babalan Beach. However, previous research results were not optimal in handling abrasion, one side Semat Coastal Jepara was erosion but on the other side in Wedung Beach annually formed delta (soil arising altered form of pond) which is enlarge, due to the results of the sediment carried by the flooding of Wulan River accumulate in estuaries beach and wave scour sediment flows from the direction of change reclamation Marina Beach Semarang.

**Keywords:** delta preservation strategy, diversion, reclamation, abrasion,

## **1. Introduction**

In the phenomenon that happening on earth since the industrial revolution of the mid 19th century until today is the burning of fossil fuels are increasing and changing the forest to other land uses either cut down or burned in a manner so that the concentration of CO<sub>2</sub> in the atmosphere increases. The effect is to increase the number of air temperature of between 0.4 to 0.7 Celsius until the late 20th century and is predicted to reach 3.5 Celsius in 2050 when the number of CO<sub>2</sub> pollutant gases was double. Increasing global warming (global warming) is what causes the heat rise in sea level. The next result is the degradation of the coastal environment is like a change of an increasingly indented coastline to the mainland, then the energy waves are getting bigger and desructive. In cases Abrasion and Rob occurring in Semat Beach Jepara until Demak is one example of the impact of global warming and climate that is going. Abrasion and Rob is going on this beach make a long coastline in Semat Beach Jepara to Demak changed from 17.4 kilometers to 30.4 kilometers.

In order to prevent degradation of the coastal environment is necessary a model of soil conservation arise that have a positive impact on fish farmers in Berahan Kulon Village and utilization changes reclamation Marina Semarang in other side makes the coastal erosion in Semat Beach. So, many fish ponds changed into ocean. In looking for right solution strategy that does not give impact to public so that the appropriate solution

is to make sudeten Wulan River towards Semat Beach Jepara when flood in the area come the sediment that settles in the estuary beach then appeared delta or new soil arose what can recover the affected shoreline erosion .

### **The main objective of this research**

1. Describe how to conserve delta or soil arose for the continuation benefit of the pond farmers, therefor without make the abrasion of the coastal.
2. Depth response as well as funding and some efforts that people did, the government of Demak in face of declining quality of the coastal environment as a result of climate change, reclamation of Marina Beach and coastal abrasion in Jepara.
3. Make empirical model of delta preservation in a way built Wulan River diversion.

## **2. Literature review and Development of Hypotheses**

### **Delta formed processing**

Delta is an important area for people that the function to settling, farming and fishing. The term of delta firstly used by Herodotus (Greek historian) in 490 BC who see that the shape of the Nile River in Egypt sediment resembling the letter D (or Delta in Greek). Delta really correlated with coastal flooding, sea waves, erosion sea and storm that blow to the ocean . Beside that, there are several factors that influence the formation of the delta: climate, water discharge, sediment product, wave energy, tidal processes, coastal currents, slope exposure and shape of the recipient basin and tectonic processes.

The terms of the formation of the Delta

- The minimum speed of river flow at estuary.v
- The much number of material that brought the river as a result of erosion.
- The Sea at the estuary really there are no wave.
- The beach is relatively flat
- Materials of sedimentation results disturbed by the ocean water activity
- There is no tectonic disturbance (except for a decrease in the sea floor equivalent with river deposition, such as Mississippi Delta)

Basic of Elements Delta

- River: as a media to carry the materials
- Distributary Plain: a part of delta that made on land, usually as a swamp.
- Delta Front: a part of delta which is made in front of delta plain as a shallow sea
- Pro Delta: a head part of delta towards the ocean.

### **Alternative Solutions of Delta Conservation**

Based on data from the Environmental Department of Demak, it is known that the coastal area in the region of Demak has a length of 41 kilometers. From the coastal region there are 90.4 hectares of mangrove forests. Coastal abrasion level areas increasing in Demak from year to year, and the condition is very worrying. Currently, at least 409 hectares of land area in the coastal Kendal region lost due to exposure to abrasion (Suara Merdeka 2007).

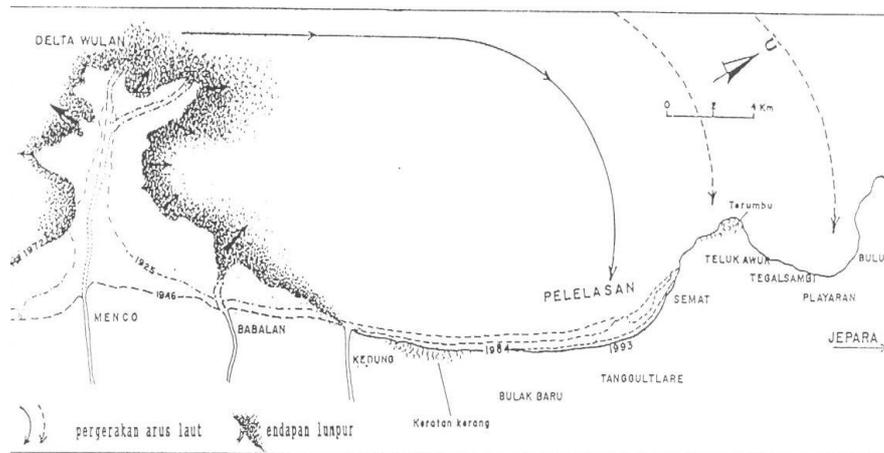


Figure 1. Formation of delta estuary Wulan

### 3. Research Methods

Data collecting method used a guideline in depth interviewing by using instruments, direct observation, and documentation. Sources of research information include local society, leader figures of society, and government. If the information from it still not enough to declare the answer then a triangulation technique is needed to make it clear. Forms of research instruments are interviews and documentation list. In order to reducing data aspirations of the people used focus group discussion (FGD) method.

#### Method Of Collecting Data

1. The secondary data which were taken from literature study, library activities and previous research to obtain a theoretical description of the problem of the study.
2. The primary data which were the sources and research that taken from original source (not through intermediaries).
3. Interview in structure way, that is by asking questions that have been prepared to respondents.

### 4. Data Analysis

People effort in the face of disaster abrasion, based on field observations can be seen in some of the people's effort in the face of disaster abrasion, such efforts include preventive measures (mitigation) as a structure in the form of planting mangrove and the Sudeten Wulan river, build wave breake, and build houses on stilts. Beside it, mitigation non-structure include counseling from various agencies, then try to blow up the issue of abrasion in the area as the National to International news.

#### Disaster of Abrasion and Delta Formation of Society Response

Based on in-depth observations and interviews that have been conducted, most of the people in the area affected by abrasion is very responsive in the face of disaster abrasion. In fact, not only the local people affected are present in the research but also society, local government, leader of village, related Department such as BAPPEDA, Maritime Affairs and Fisheries, community empowerment also give a positive response to the activities related to abrasion. All the party never stops and despair in an effort to overcome the abrasion.

### **People Effort In Disaster Abrasion**

Based on field observations can be seen in some of local people's effort in the face of disaster abrasion, such efforts include preventive measures (mitigation) as a procedure in mangrove planting, built wave breaker, and build a house on stilts. Mangrove communities consist of plants, animals, and microbes, however, it without mangroves plant, the area can not be called a mangrove ecosystem (Jayatissa et al., 2002).

### **5. Results and Discussion**

The most basic efforts in the preservation of the coastal environment as a result of abrasion disaster is to replant mangroves as much as possible, that mangroves can resist the waves needs to be planted each individual and the local society. For those reasons, mangrove planting and preservation activities should be an obligation and responsibility of society. The other models can use the Sudeten Wulan river towards the right toward the Babalan beach so that there are much sediment that settles towards the estuary can provide abrasion continually. In order to maximize the optimal handling the abrasion it is necessary to align their existing delta and some land sacrificed for the diversion of the river.

### **6. Conclusion**

The area that get the worse impact of abrasion in Demak District in Babalan Beach then the solution is built the Sudeten Wulan River hopefully finish can form a new delta. People effort in the face abrasion by planting mangroves, raising the floor of the house, making home panggung. Government efforts in facing the disaster is do structural and non structural wayl, including the rehabilitation of trails, manufacture protective wall waves, coastal rehabilitation and relocation of residents as well as the budget allocation for the dredging work Wulan River diversion.

### **References**

- Martinus Njhoff, the Hague Bengen, DG. 2004. Pengelolaan Wilayah Pesisir Terpadu Berbasis Daerah Aliran Sungai (DAS). *Artikel* dalam buku Interaksi Daratan dan Lautan Pengaruhnya terhadap Sumberdaya dan lingkungan, editor: Wahyu Budi Setyawan, dkk. LIPI.
- Departemen Kehutanan, 2012. *Inventarisasi dan Klasifikasi Mangrove*. Balai Pengelolaan DAS Pemali Jratun, Semarang.
- Djoko Harmantyo, 2010. Skenario Alih Teknologi Adaptasi dan Mitigasi Dalam Menghadapi Dampak Global Warming. *Makalah* Pertemuan Tahunan Ikatan Geograf Indonesia.
- S. Budi Prayitno, 2012. Penanganan Masalah Pengelolaan dan Penataan wilayah pesisir. *Makalah* dalam Lokakarya Penyusunan Program Penelitian LEMLIT UNDIP. Semarang
- Subandono dan Budiman. 2012. *Hidup Akrab dengan Gempa dan Tsunami*. Penerbit Buku Ilmiah Populer. Bogor
- Subandono D., Budiman dan Firdaus A. 2012. *Menyiasati Perubahan Iklim Di Wilaah Pesisir dan Pulau-Pulau Kecil*. Buku Ilmiah Populer. Bogor Supriharyono, 2012. *Konservasi Ekosistem Sumberdaya Hayati di Wilayah Pesisir dan Laut Tropis*. Pustaka Pelajar: Yogyakarta.
- Mile B. Huberman dan Michael A. 2013. *Analisis Data Kualitatif*.