

Study of Public Lands Compensation in Capacity and Existence of Abrasion and Accretion (Case Study: Northern Coast Region, Indramayu, West Java)

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Key words: Abrasion, Accretion, Public Lands Compensation

SUMMARY

Rate of abrasion and sedimentation in area of Java Northern Coast (Indramayu) relatively quickly has changed the pattern of land tenure in that region. The significant differences have been occurred in the region which is affected by abrasion and sedimentation.

The using of high resolution satellite images with different periods of time helps knowing abrasion and accretion areas in Northern Coast Region West Java through high - resolution image interpretation in certain periods of time. After known the area which is affected by abrasion and accretion, abrasion and sedimentation, part of accretion, rate can be calculated. With knowing rate of abrasion and sedimentation, the areas which will be lost and get sedimentation, can be predicted. The area which is affected by sedimentation can be used by public for land effectively and residential.

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1. INTRODUCTION

1.1 Backgrounds

Indramayu lies in 107°52' - 108°36' E and 6°15' - 6°40' S with coastline length is about 114 km in Java Northern Coast which is affected by abrasion and sea level rise. Abrasion rate in the last ten years reaches 8.23 Ha/year, while sea rise level reaches 0.8 cm/ year. So it is projected that the next ten years will be more sea water coming into the mainland because northern Indramayu is lowland with a slope of 0 – 2% that will soak residential areas and public facilities.

The rate of abrasion and sea level rise increases, but rate of sedimentation in another area, still in Indramayu, is wider because Cimanuk River stream, which empties into Indramayu Northern Coast, carries 56.3 million ton mud per year. So the mouth of Cimanuk River creates delta with its variation growth rate between 7 and 15 km towards sea. Delta bars, the result of accretion, spread over six districts of Indramayu and there are Indramayu District, Pasekan District, Cantigi District, Losarang District, Kandanghaur District, and Krangkeng District.

Now, the lands which are scrapped by abrasion reaches 200 Ha and many of those have been certified. From that problem, compensation must be given for people who lost their land due to abrasion. It is hoped that compensation is given in the form of land, not just money. The area which gets abrasion and has delta bar is hoped for being compensation by government, especially for people who live in abrasion land. So, it can be fulfilled justice principle in the matter of land tenure ownership in Indramayu Northern Coast.

1.2 History of Landscape Changing in Java Northern Coast

Back then, natural mangrove ecosystem dominated northern Indramayu. From correspondence, it's known that area of mangrove along Indramayu coast to Pamanukan, Subang reach out 14000 Ha with trees' diametres was more than 100 cm. At the Pasekan District and Sindang District, mangrove area was about 2500 Ha in the 1960s. The mangrove area decreases drastically in recent decades. The main reason of decreasing is land clearing for aquaculture areas and also taking mangrove wood excessively. In Pasekan District, mangrove forests in protected areas has been reduced up to approximately 500 Ha in 1994. Thus, the reduction rate of mangrove forests 5 reaches 60 Ha per year in average.

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Natural mangrove forests, which are remained in Pasekan District, is shown in Indonesian map. Natural mangrove forests in Indramayu are still decreased until now. Based on aerial photo from Google Earth in 2008, mangrove ecosystems are remained only in small patches scattered in northern side of Indramayu (Pasekan District). One of mangrove species, *Rhizophora* sp, are still found on the bank of ponds with their height reaching 7 m and trunk diameter reaching over 50 cm. Even so, the number of individuals, who are small and scattered, show that natural mangrove forests in Indramayu coast has not been functioned properly (Arie, 2011).

2. OBSERVATION AND RESULT

2.1 Observation

The research is started with literature study. The literatures that are used is books, theses, law, and papers. After doing literature study, data acquisition will be done. This research needs oceanographic data, including coastline, bathymetry, sedimentation, tidal, and wind data which is overlaid with satellite images over five years period. From overlaying process, the result is the extent of abrasion and accretion. After knowing their extents, it can be calculated abrasion and delta bar growth rate (Handayani, 2012).

After getting abrasion and delta bar growth rate, then overlaying it with administration, land use, and land value maps for making land tenure regulation. Land tenure has structures, there are land area and location; dependency rate of land; and land tenure institutional. Based on land tenure regulation and structures, design of compensation can be made. Compensation is given for locals who lives in abrasion - affected region. The method for compensation is equivalency method. Equivalency means the locals are given land as exact size as their previous land. So locals, who lost their land due to abrasion, can get compensation in the form of land in delta bar area, the result of sedimentation. But it will be happened if delta bar area is larger or same as abrasion area. If it is not, government should find unowned land in other location as compensation. The visualization is in figure 1.

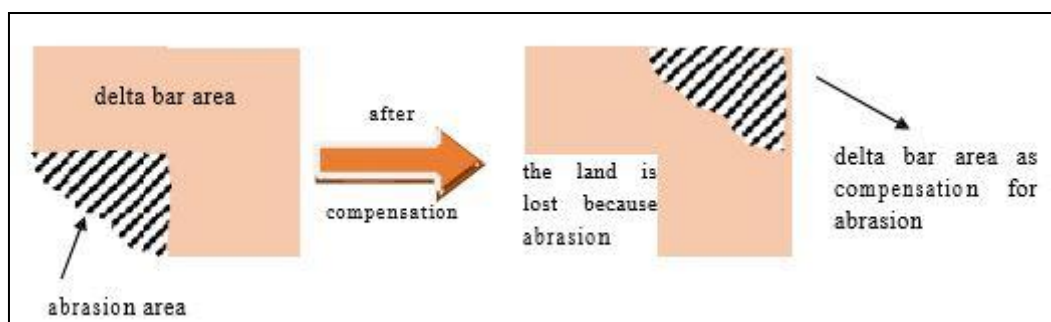


Figure 1. Scheme of Land Compensation

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2.2 Result and Discussion

First thing that we do for this research is field surveying. Survey is done in Karangsong, it is area that part of Northern Coast Region in Indramayu. The documentation of survey is shown in figure 2.



Figure 1. Coastline of 2006, 2009, and 2013

After field surveying, then data processing. There are three satellite imageries from Google Earth from 2006, 2009, and 2013 in part of Northern Coast Region, Indramayu. The coastline in satellite imageries are digitized with ArcGIS 10.1. The result of coastline digitizing is shown in figure 3.

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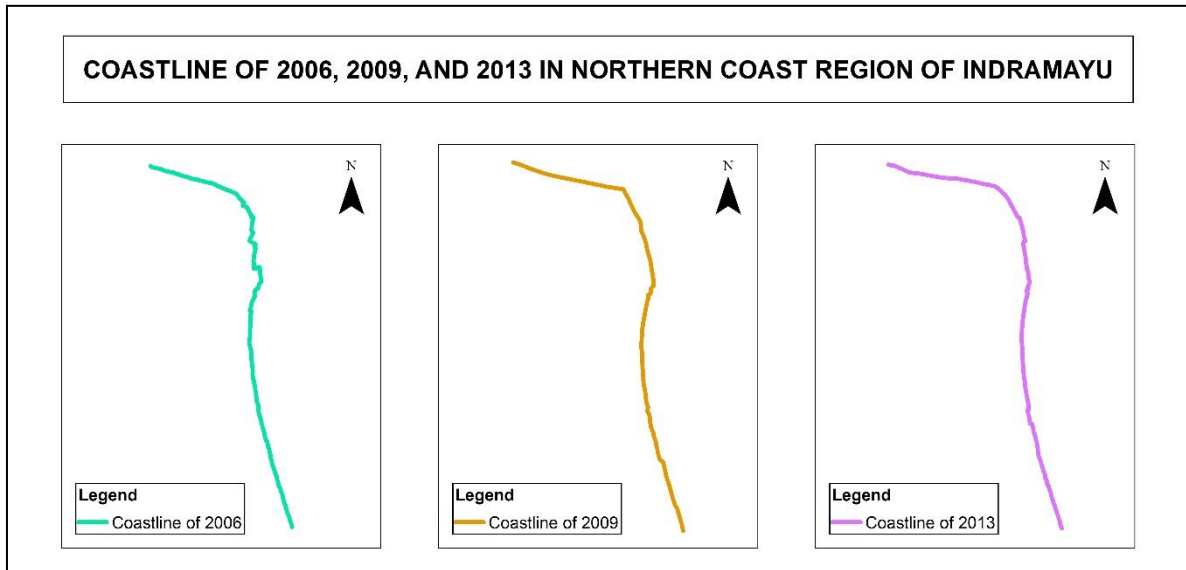


Figure 2. Coastline of 2006, 2009, and 2013

After digitizing, the coastline in 2006 is overlaid with coastline in 2009. Then, the coastline in 2009 is overlaid in 2013. The overlaid coastline is digitized again into polygon, with the polygon, it can be known the extent of abrasion and accretion. For example, if coastline in 2006 is more backward than 2009, it must be there is an accretion in following year. But if 2006 is more forward than 2009, there must be an abrasion. It is shown in figure 4 and 5.

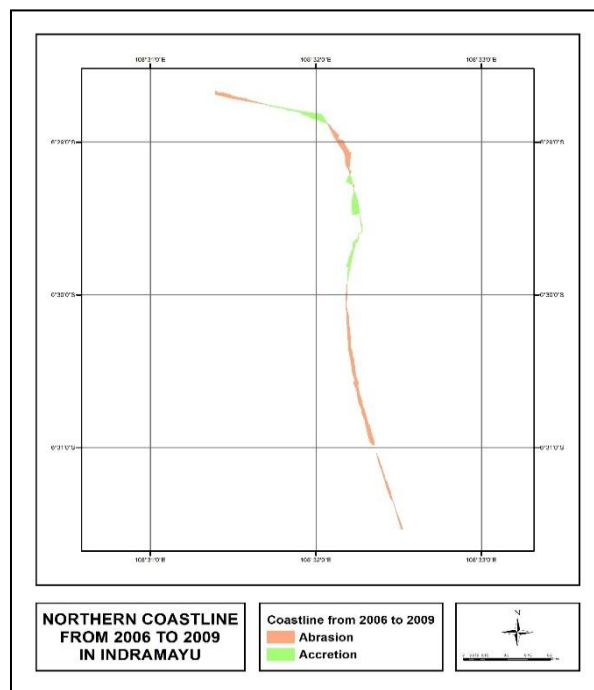


Figure 3. Northern Coastline from 2006 to 2009 in Indramayu

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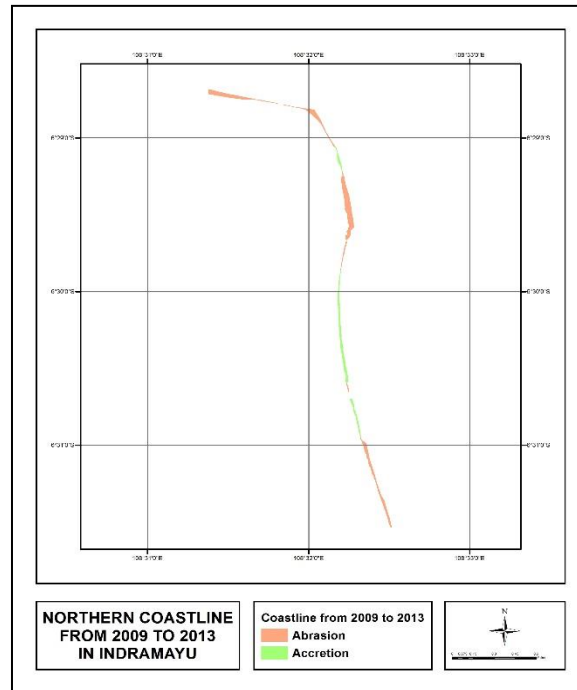


Figure 4. Northern Coastline from 2009 to 2013 in Indramayu

The extent of abrasion and accretion is sum of change between coastline in 2006 and 2009, also 2009 and 2013. It will be divide by year difference of 2013 and 2006, then the result is abrasion rate and accretion rate per year in Northern Coast Region of Indramayu. The abrasion rate is 2.973 ha/year and the accretion rate is 1.245 ha/year. It is shown in the table 1 the extent of abrasion and accretion.

Table 1. Abrasion and Accretion Area

Year	Abrasion Area (Ha)	Accretion Area (Ha)
2006 - 2009	10.789	5.284
2009 - 2013	9.398	2.918

It seems that abrasion area is larger than accretion area and rate of abrasion is two times of accretion rate. If it meets ideal condition, abrasion land can be compensated with accretion land. It means people whose land affected by abrasion can not get compensation in a form of land. From this research, it is given some alternative of compensation model that can be applied in Northern Coast Region of Indramayu.

- a) The people that have land parcels in abrasion area can be relocated in accretion area. For the people whose land can not be compensated in the form of accretion land, it will be compensated in a form of money that its amount is relevant with market price in Northern Coast Region in Indramayu.

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- b) Optimization of land use in accretion area for business development, such as embankment. It is done as compensation of abrasion that can cause loss of occupation.

To create the alternative of land compensation model, it needs participation of local and central government to manage legal status of land for preventing of land conflict. If it is possible, it needs Local Government Act about the using of accretion land. This is the best solution as compensation that has equity in abrasion and accretion land.

3. CONCLUSION

In conclusion, compensation cannot be implied at accretion land because the rate of abrasion is two times of accretion rate. From the data, total difference of abrasion to accretion reach 11.985 ha, the total land of abrasion much larger than accretion, so it really difficult to convert the loss area because abrasion to accretion area. To solve this problem, needed a further research about abrasion and accretion

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BIOGRAPHICAL NOTES

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