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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Background

- The coastline length in Indramayu is about 114 km in Java Northern Coast with abrasion rate in the last ten year reaches 8.23 Ha/year and sea rise level reaches 0.8 cm/year.
- Now, Lands which are scrapped by abrasion reach 200 Ha and many of those have been certified.
- 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.
Output

1. Knowing the abrasion extent in the region of Northern Coast of West Java through high-resolution image interpretation over five years period.
2. Knowing the extent of delta bar growth as a result of accretion from Cimanuk in region of Northern Coast of West Java through high-resolution image interpretation over five years period.
3. Calculating abrasion rate in the region of Northern Coast of West Java over five years period.
4. Calculating delta bar growth rate in the region of Northern Coast of West Java over five years period.
5. Having ability to provide solution for locals who are lost their lands because affected by abrasion through compensation of land tenure in delta bar in the region of Northern Coast of West Java.
Objectives

Having ability to provide for locals who are lost their land because affected by abrasion through compensation of land tenure in delta bar in the region of Northern Coast West Java
Research Method (1)

- Literature study
- Data acquisition:
  - Oceanographic data, such as coastline, bathymetry, sedimentation, tidal data and wind data.
  - Minimal two satellite images over five years period.
  - Land data, such as land administration, land use, and land value maps.
Research Method (2)

- Data processing:
  - Overlaying satellites with different epoch to know change of land which is resulted by abrasion and accretion
  - Calculating abration and delta bar growth rate using oceanographic data, then overlaying with satellite and land data
  - Proposing the compensations based on land tenure regulation
COASTLINE OF 2006, 2009, AND 2013 IN NORTHERN COAST REGION OF INDRAMAYU

Legend
- Green: Coastline of 2006
- Orange: Coastline of 2009
- Pink: Coastline of 2013
Satellite Imagery 2006
Satellite Imagery 2009
NORTHERN COASTLINE FROM 2006 TO 2009 IN INDRAMAYU

Coastline from 2006 to 2009
- Abrasion
- Accretion

FIG 2017
9 May - 2 June 2017
NORTHERN COASTLINE FROM 2009 TO 2013 IN INDRAMAYU

Coastline from 2009 to 2013
- Abrasion
- Accretion
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.

<table>
<thead>
<tr>
<th>Year</th>
<th>Abrasion Area (Ha)</th>
<th>Accretion Area (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006 - 2009</td>
<td>10.789</td>
<td>5.284</td>
</tr>
<tr>
<td>2009 - 2013</td>
<td>9.398</td>
<td>2.918</td>
</tr>
</tbody>
</table>
## Land Use of Abrasion & Accretion

- **2006 – 2009**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Abrasion (Ha)</th>
<th>Accretion (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>River</td>
<td>1.404</td>
<td>0.000</td>
</tr>
<tr>
<td>Sand Beach</td>
<td>9.381</td>
<td>1.113</td>
</tr>
<tr>
<td>Tidal Rice Field</td>
<td>0.004</td>
<td>4.171</td>
</tr>
</tbody>
</table>

- **2009 – 2013**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Abrasion (Ha)</th>
<th>Accretion (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embankment</td>
<td>0.000</td>
<td>0.329</td>
</tr>
<tr>
<td>Mangrove Forest</td>
<td>0.068</td>
<td>0.590</td>
</tr>
<tr>
<td>Sand Beach</td>
<td>9.330</td>
<td>2.000</td>
</tr>
</tbody>
</table>
Compensation Model (1)

- Two alternative for compensate the land whose got abrasion:
  - 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.
  - 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.
**IDEAL CONDITION**

Abrasion Rate = Accretion Rate

The people that have land parcels in abrasion area can be relocated in accretion area with compensation in form of land with same area.

**FACTUAL CONDITION**

Abrasion Rate = 2 x Accretion Rate

**MODEL 1**

- People that have land in abrasion area will be relocated.

- If compensation in the form of land can’t be given, people will be received money that value is adjusted with market price.

- If the land is used for business (such as embankment and tidal rice field), compensation that given will be higher.

**MODEL 2**

- Optimization of accretion land with business development, such as embankment.
Conclusion

- In conclusion, compensation cannot be implied at accretion land because the rate of abration is two times of accretion rate. From the data, total difference of abration to accretion reach 11.985 ha, the total land of abration much larger than accretion, so it really difficult to convert the loss area because abration to accretion area. To solve this problem, needed a further research about abration and accretion
Documentation (1)
Documentation (2)
THANK YOU for your kindly attention

If there is a question?
References


