

FIG

FIG WORKING WEEK 2017

Helsinki Finland

29 May - 2 June 2017

*Presented at the FIG Working Week 2017,
May 29 - June 2, 2017 in Helsinki, Finland*



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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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Researchers

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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.



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Output

1. Knowing the abrasion extent in the region of Northern Coast of West Java through high-resolution image interpretation over five years periode
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-resolutin image interpration over five years periode.
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.



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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

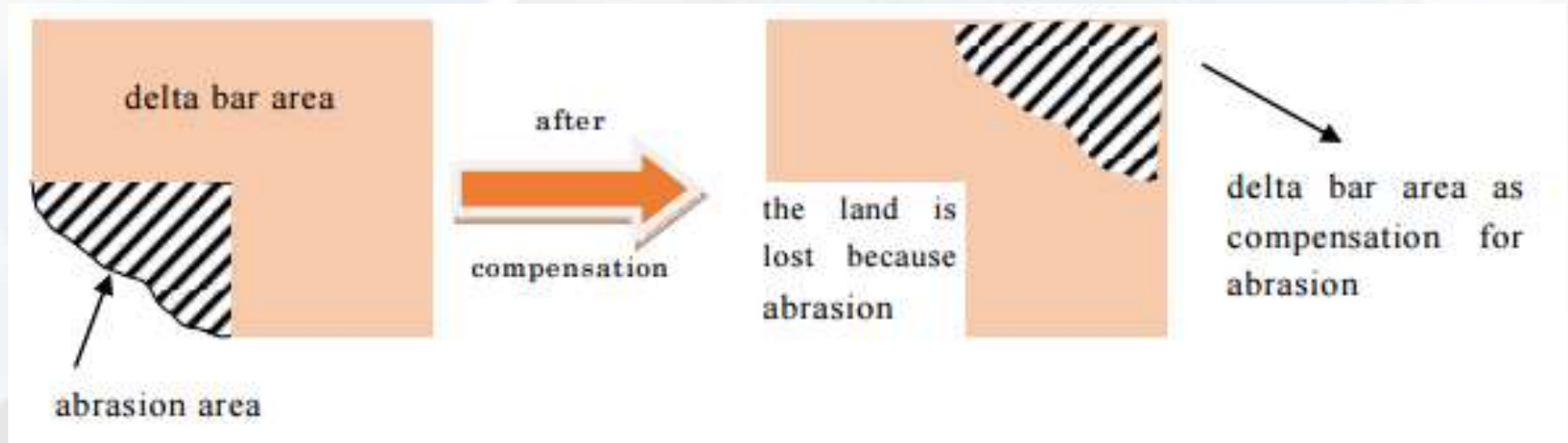




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Research Method (1)

- 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.



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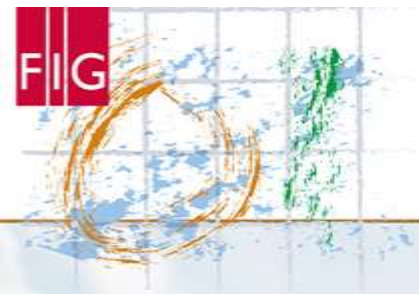


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Research Method (2)

- Data processing:
 - Overlaying satellites with different epoch to know change of land which is resulted by abrasion and accretion
 - Calculating abrasion and delta bar growth rate using oceanographic data, then overlaying with satellite and land data
 - Proposing the compensations based on land tenure regulation



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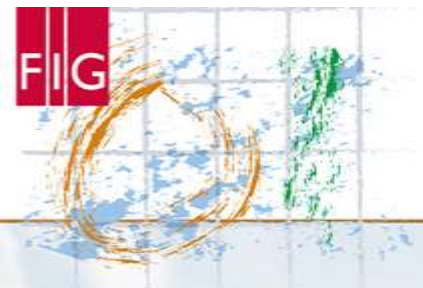


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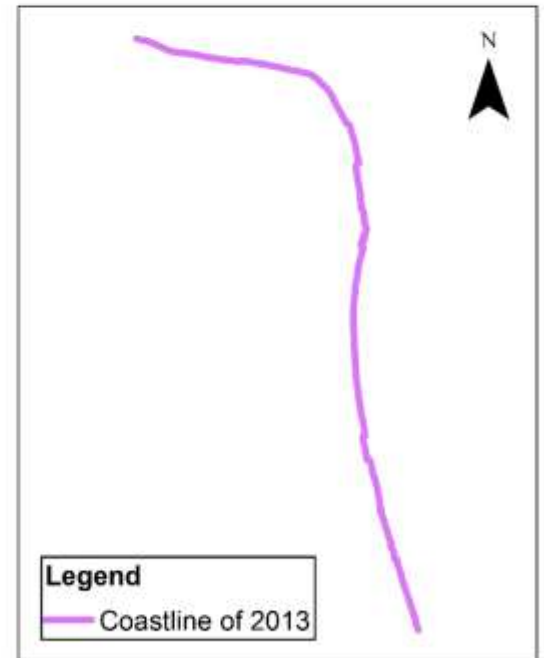
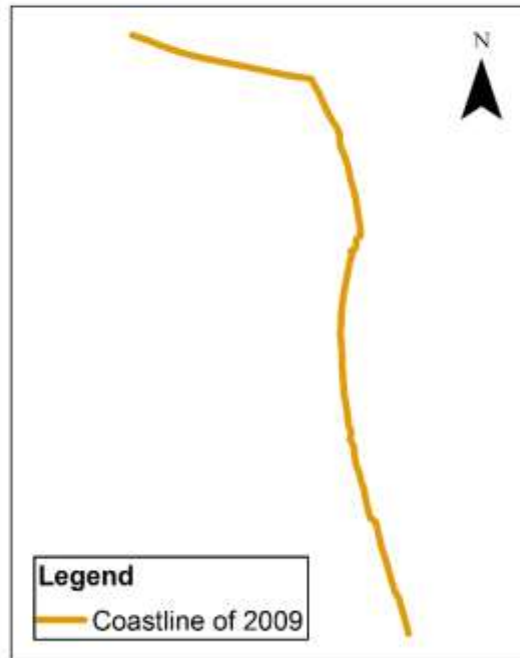
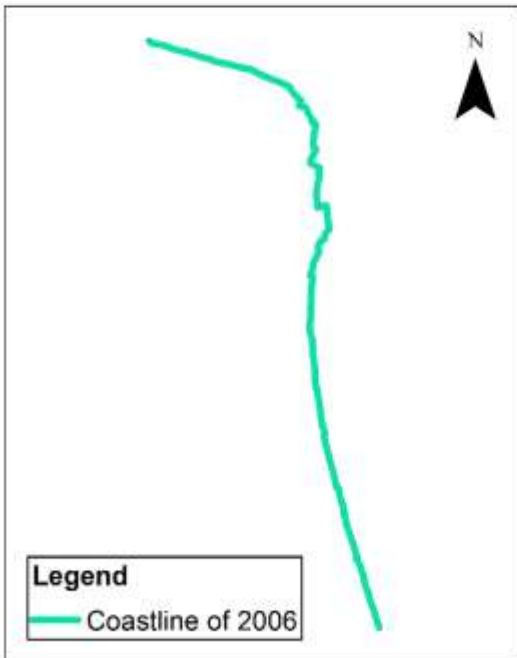
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Result (1)

COASTLINE OF 2006, 2009, AND 2013 IN NORTHERN COAST REGION OF INDRAMAYU

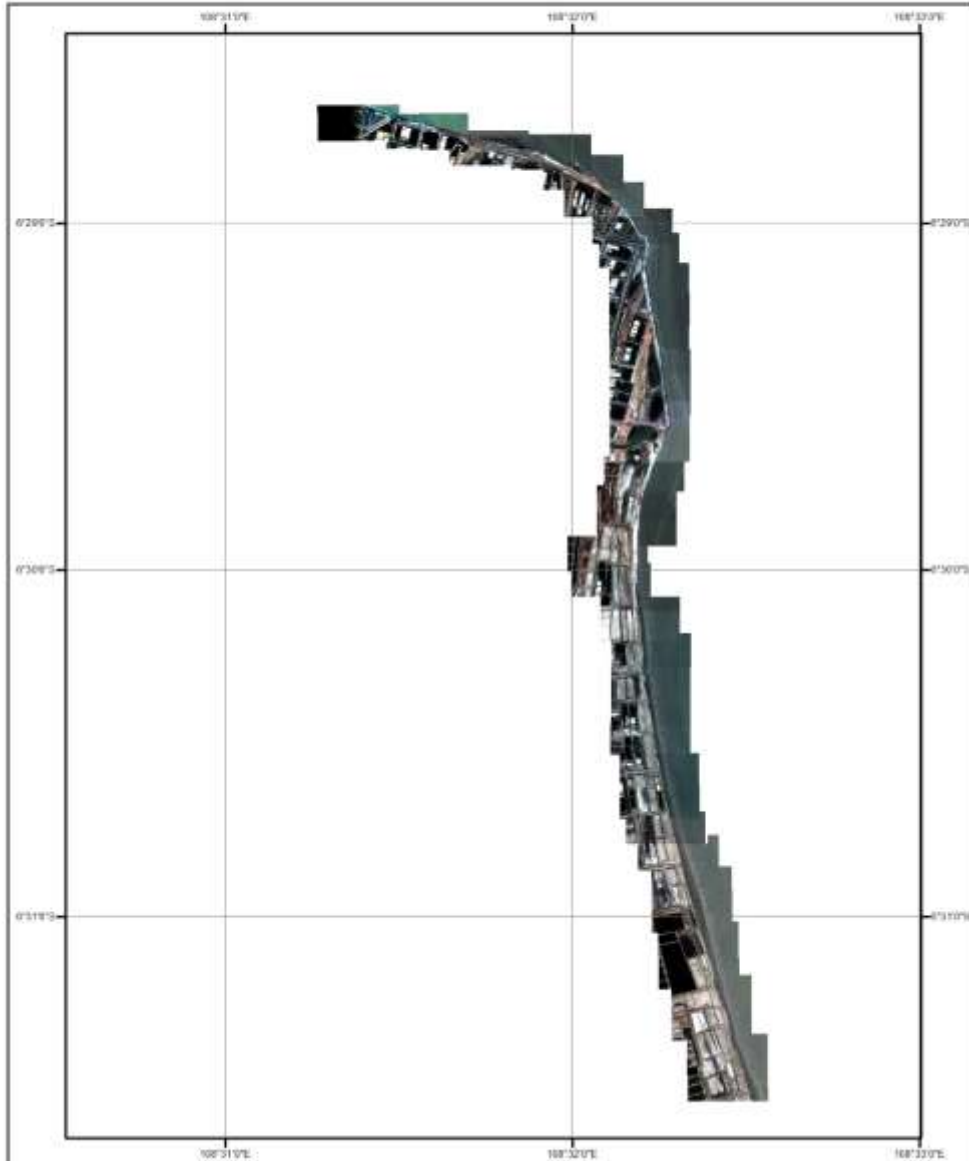




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Satellite Imagery 2006



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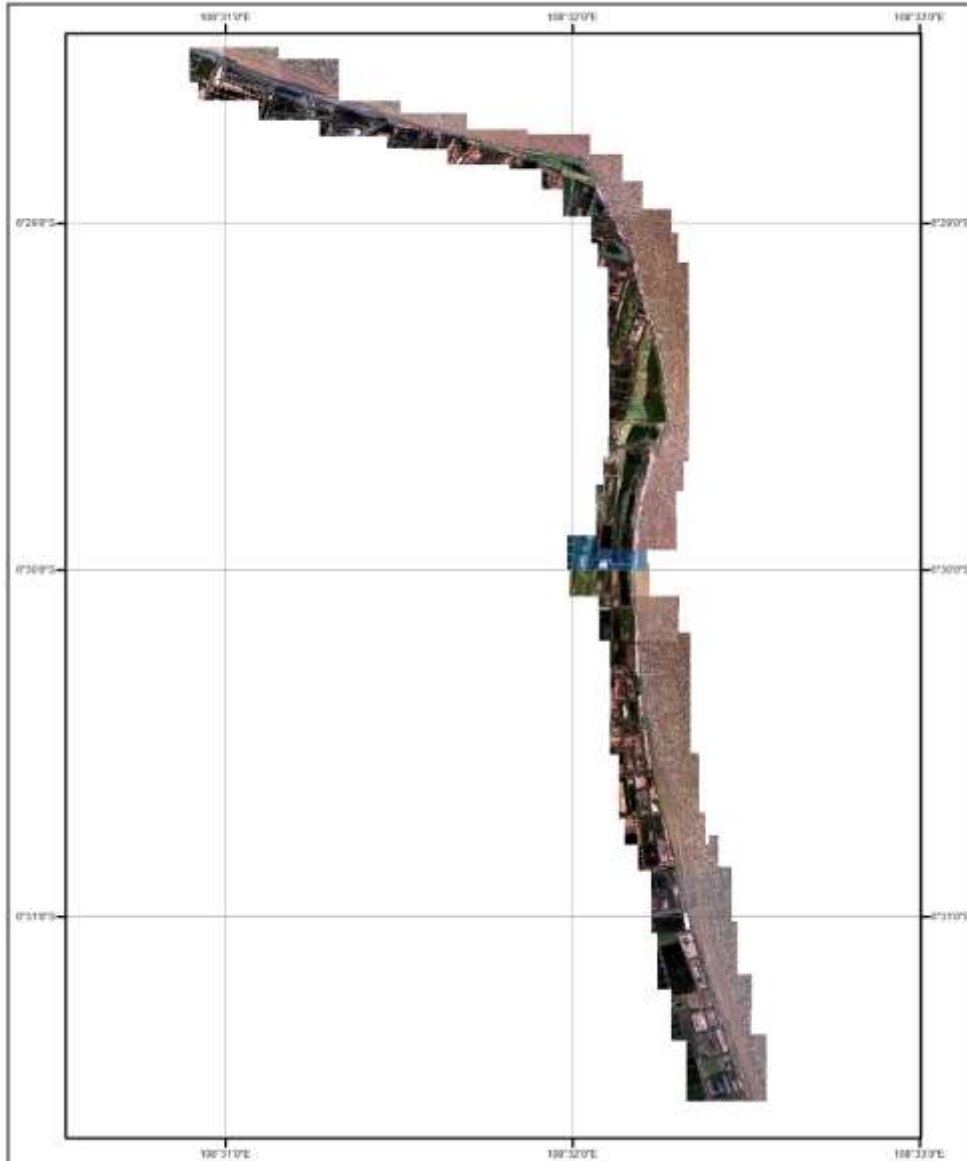




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Satellite Imagery 2009



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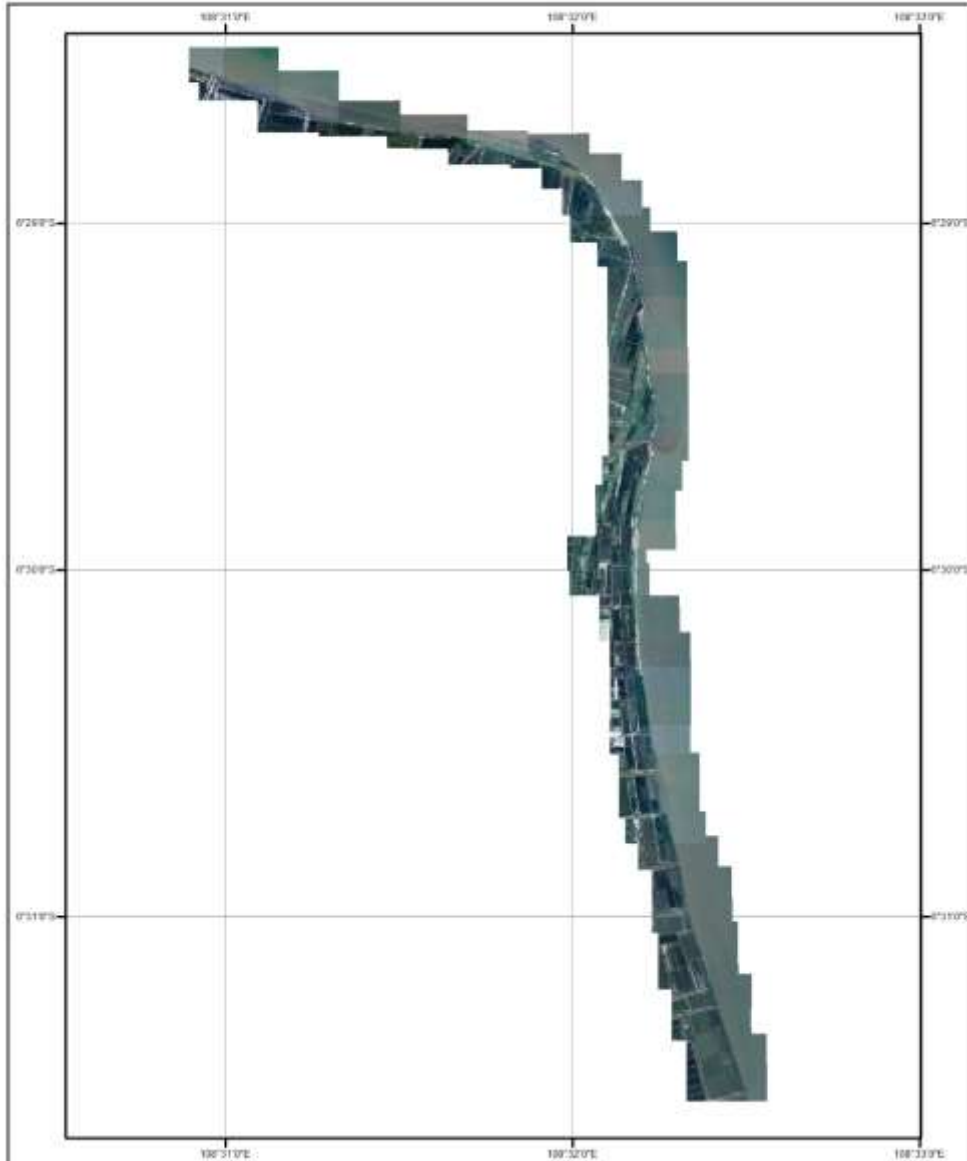
Trimble



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Satellite Imagery 2013



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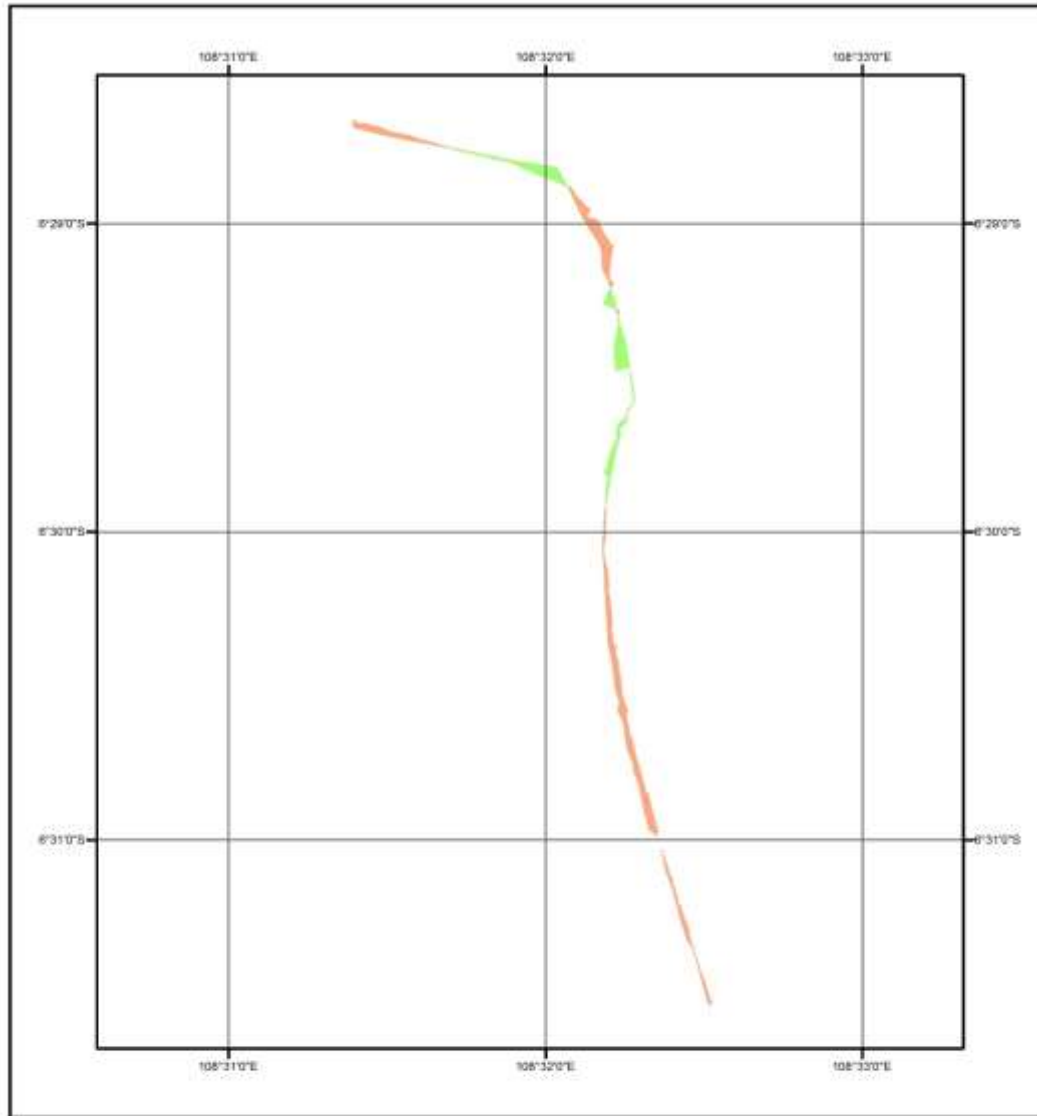


Trimble





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**NORTHERN COASTLINE
FROM 2006 TO 2009
IN INDRAMAYU**

Coastline from 2006 to 2009

-  Abrasion
-  Accretion



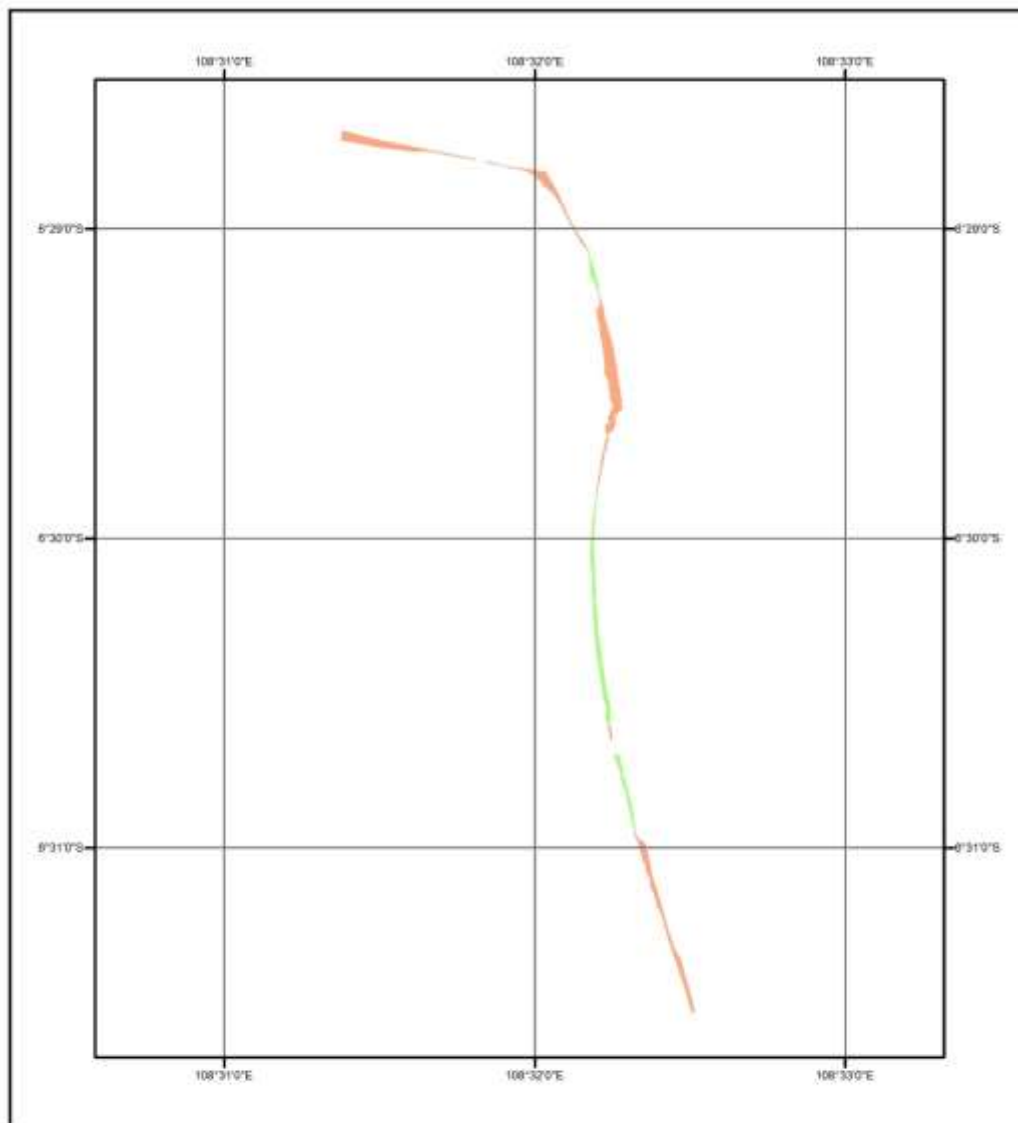
Scale: 0 20 40 60 meters





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**NORTHERN COASTLINE
FROM 2009 TO 2013
IN INDRAMAYU**

Coastline from 2009 to 2013

- Abrasion
- Accretion



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Result (2)

- 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.

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



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Land Use of Abrasion & Accretion

- 2006 – 2009

Land Use	Abrasion (Ha)	Accretion (Ha)
River	1.404	0.000
Sand Beach	9.381	1.113
Tidal Rice Field	0.004	4.171

- 2009 – 2013

Land Use	Abrasion (Ha)	Accretion (Ha)
Embankment	0.000	0.329
Mangrove Forest	0.068	0.590
Sand Beach	9.330	2.000

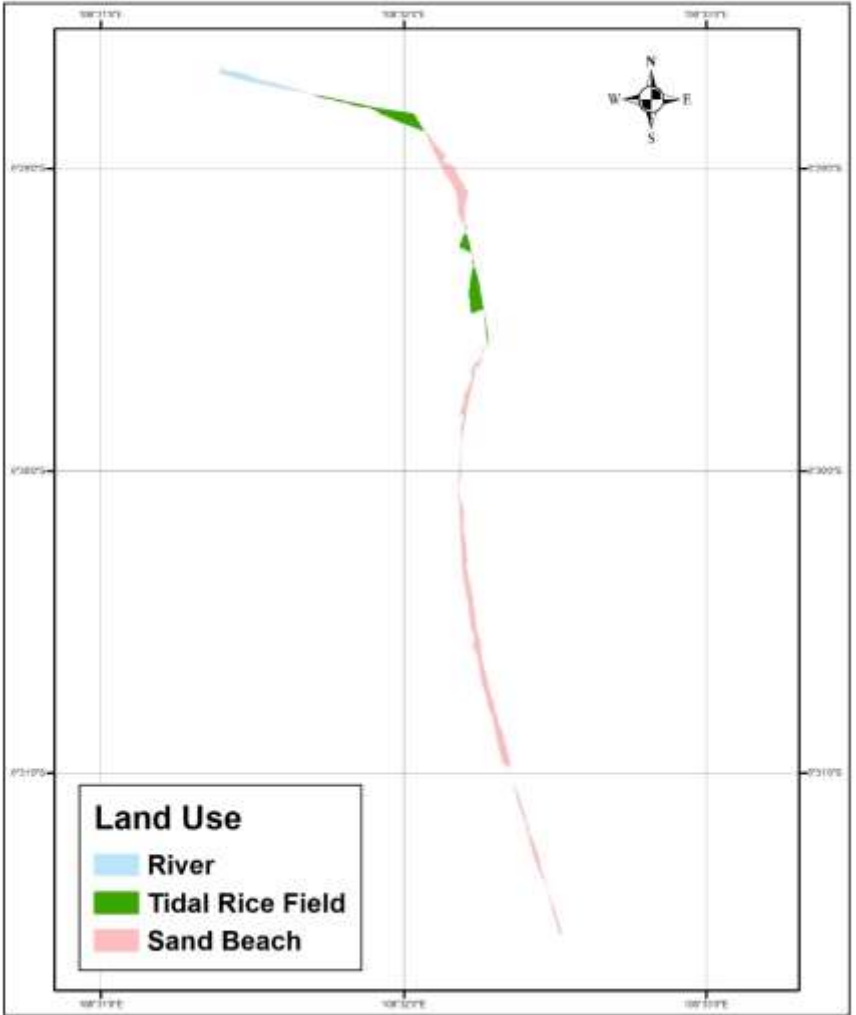


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Land Use Map 2009 (2006 - 2009)



Land Use Map 2013 (2009 - 2013)

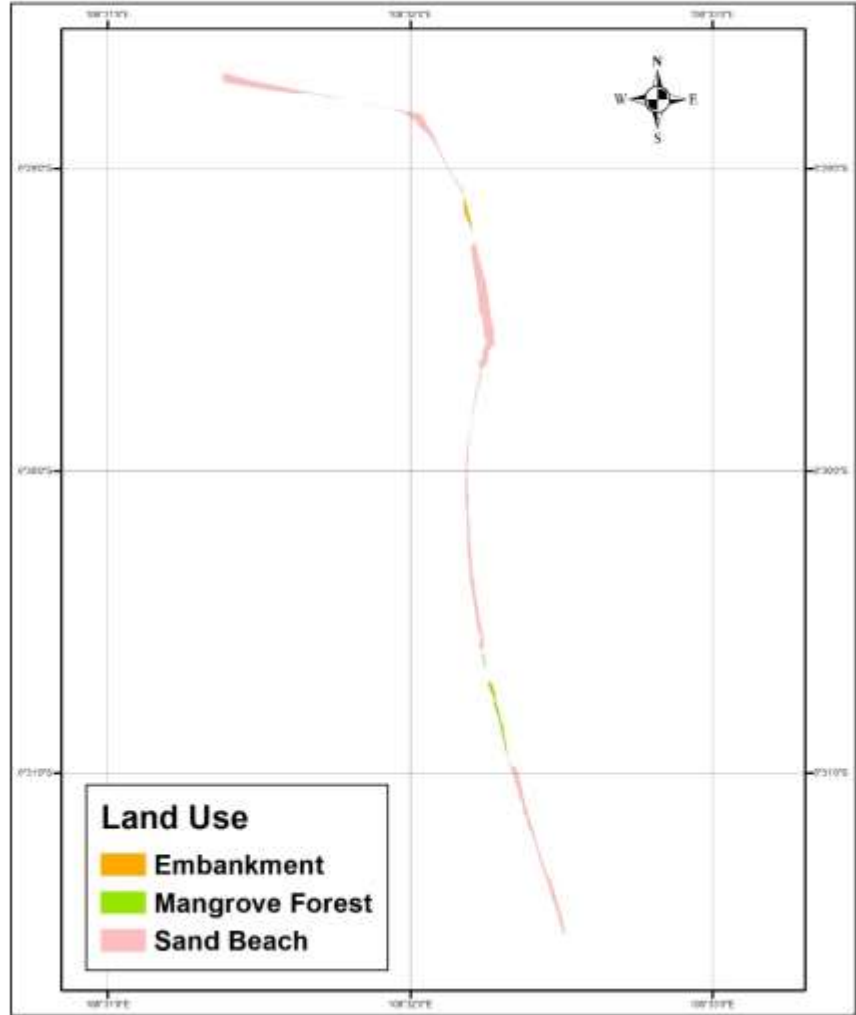




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Compensation Model (1)

- 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.



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Compensation Model (2)

- 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.



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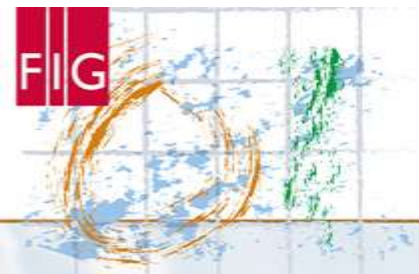


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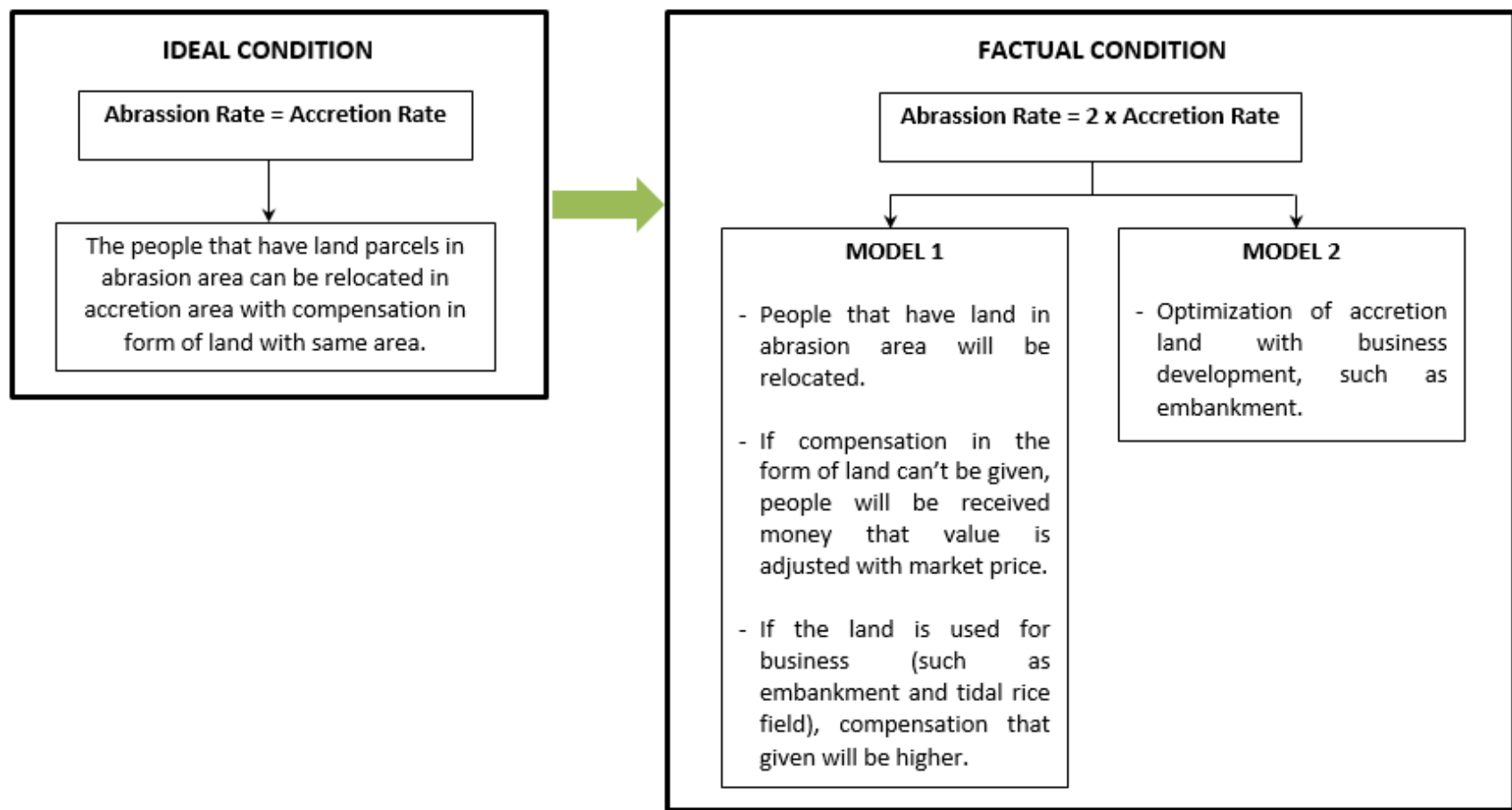




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Conclusion

- 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



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Documentation (1)



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Documentation (2)



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THANK YOU
for your kindly attention

If there is a question?



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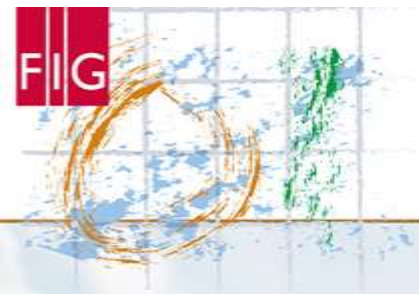


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