

ADDRESSING SEA LEVEL RISE THROUGH INTEGRATED COASTAL ZONE MANAGEMENT: SEMARANG AND DEMAK AS CASE STUDY

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Addressing Sea Level Rise Through Integrated Coastal Zone Management: Semarang and Demak as Case Study



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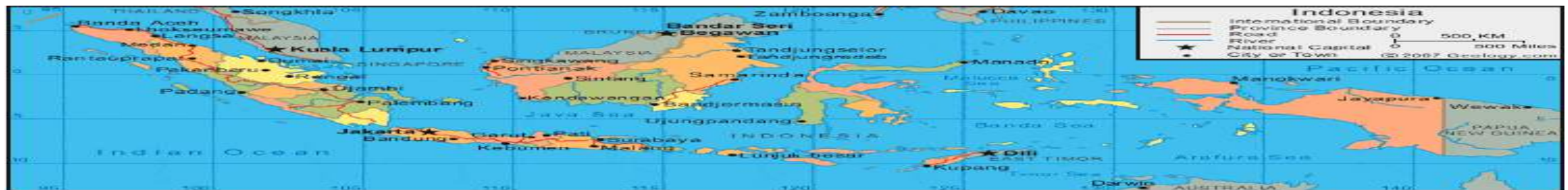
INGSA Research Associate 2018

(Indonesian Institute of Sciences (LIPI))

Macquarie University, 16 November 2018

Introduction

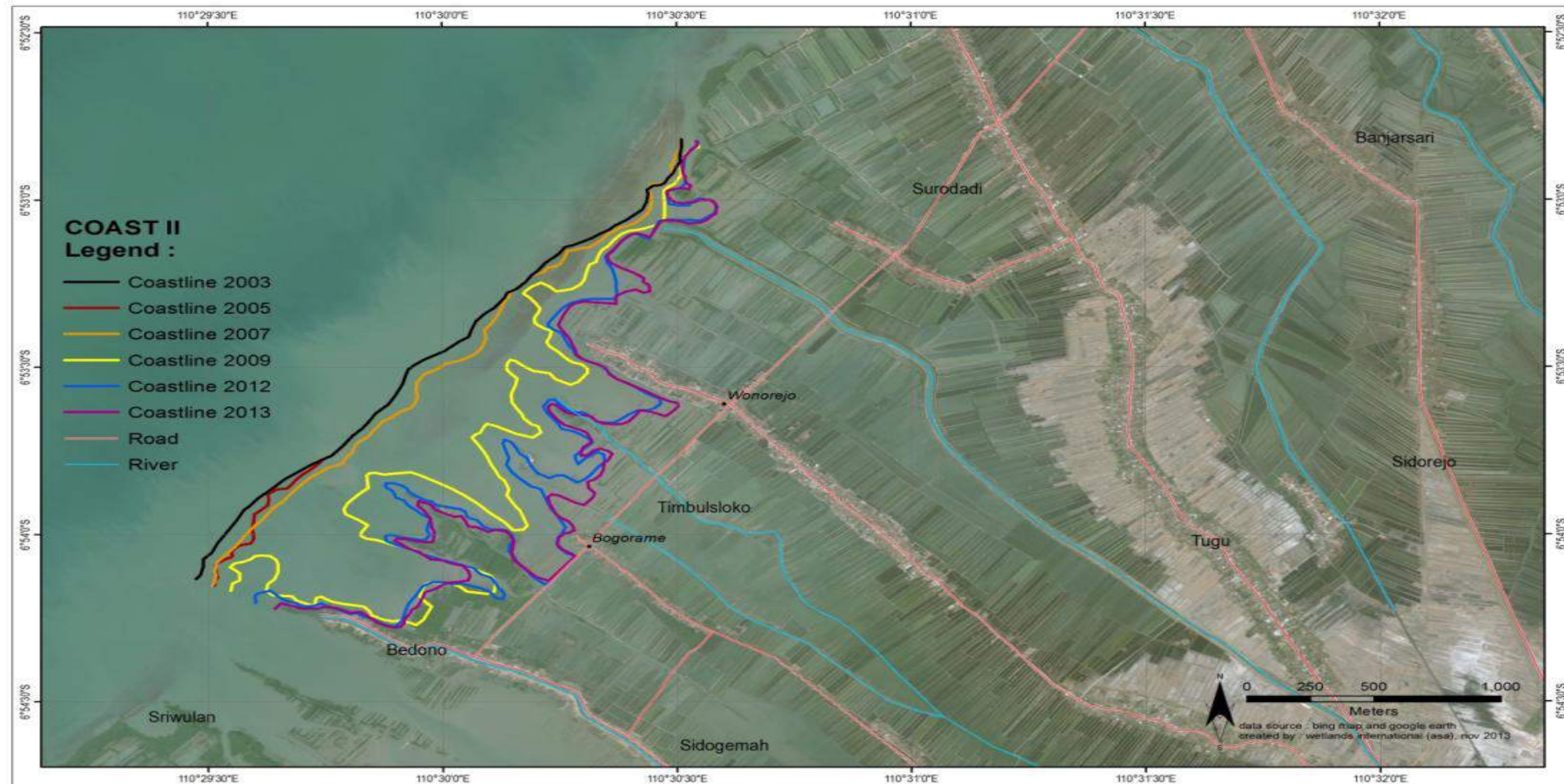
- Indonesia as an archipelagic state is extremely vulnerable to SLR threat.
- SLR impacts have been observed in several coastal cities in Indonesia such as Jakarta, Pekalongan, Semarang, Demak.
- 1,500 of Indonesia's islands could be under water by 2050 because of rising sea levels (Maplecroft's Climate Change Vulnerability Index).
- Many models by experts have projected that sea level will rise by 25 cm to 50 cm in 2050 and 2100, which will inundate most coastal cities in Indonesia. In addition, the problem of land subsidence has exacerbated the impact of sea level rise
- The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) suggested that “coastal systems are particularly sensitive to three climate change impacts such as sea level rise, warming of ocean temperature and increasing ocean acidity
- IPCC suggested that “without adaptation hundred million people will be displaced due to land loss by year 2100



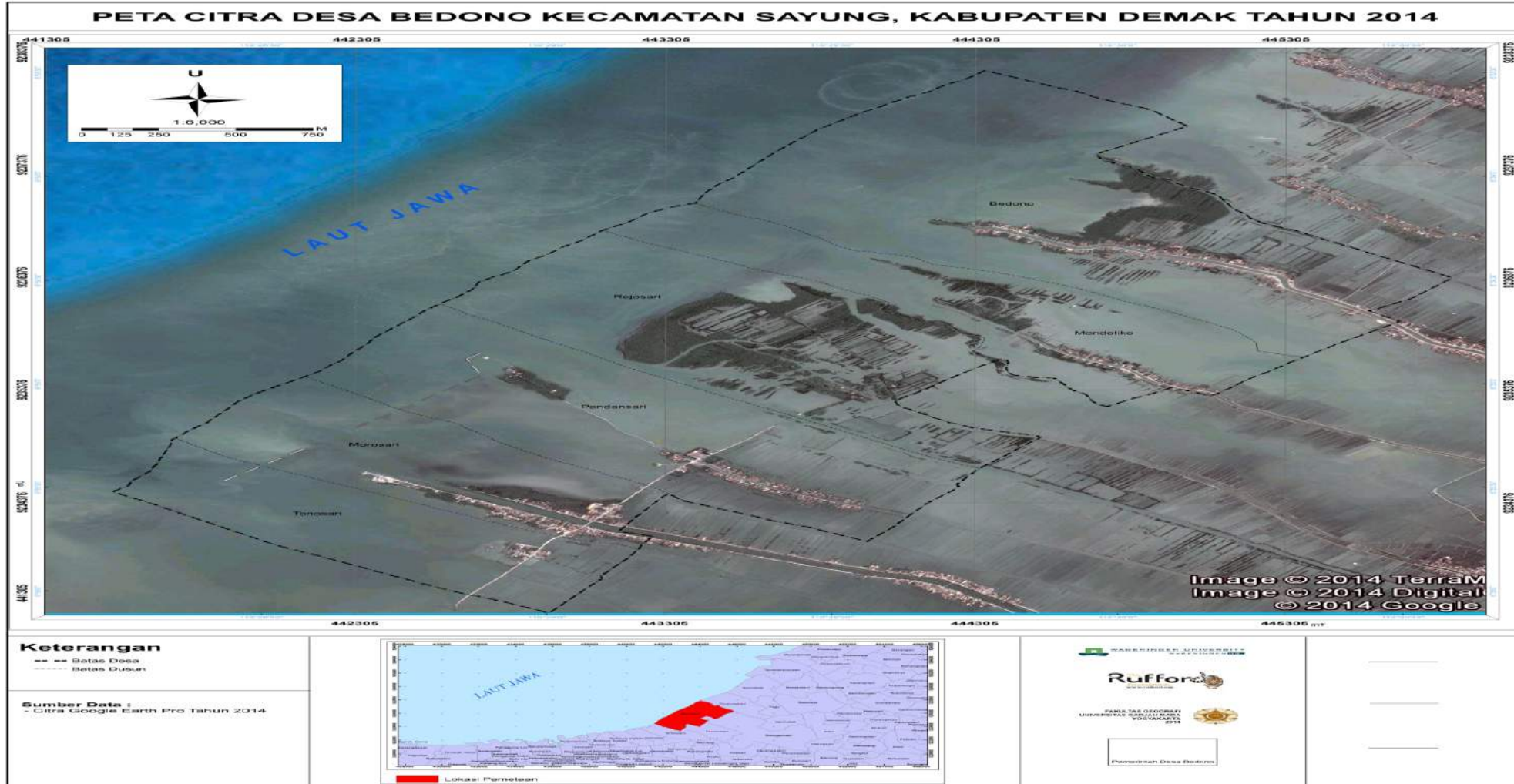
- Sea-level rise (SLR) has presents significant risks to coastal settlements, infrastructure, cultural resources, and sensitive species habitats.
- Human security has been increasingly challenged and threatened by climate change impact include undermining livelihood, compromising cultural and identity, increasing migration.
- High populated and low lying delta such as Jakarta, Pekalongan, Semarang and Demak are extremely vulnerable to sea-level rise.
- The most vulnerable group can be identified as the poor, depend on natural resources and occupy areas prone to natural disaster such as coastal flooding.
- Impacts: People are suffering of loss and damage of property (house, land loss) because of flooding and burden with the increase cost for rehabilitation. (Lost of aquaculture land (495,08 Ha) in Demak)
- Migration (500.000 people have been migrated in Semarang and Demak)
- decreased the property values of land and houses



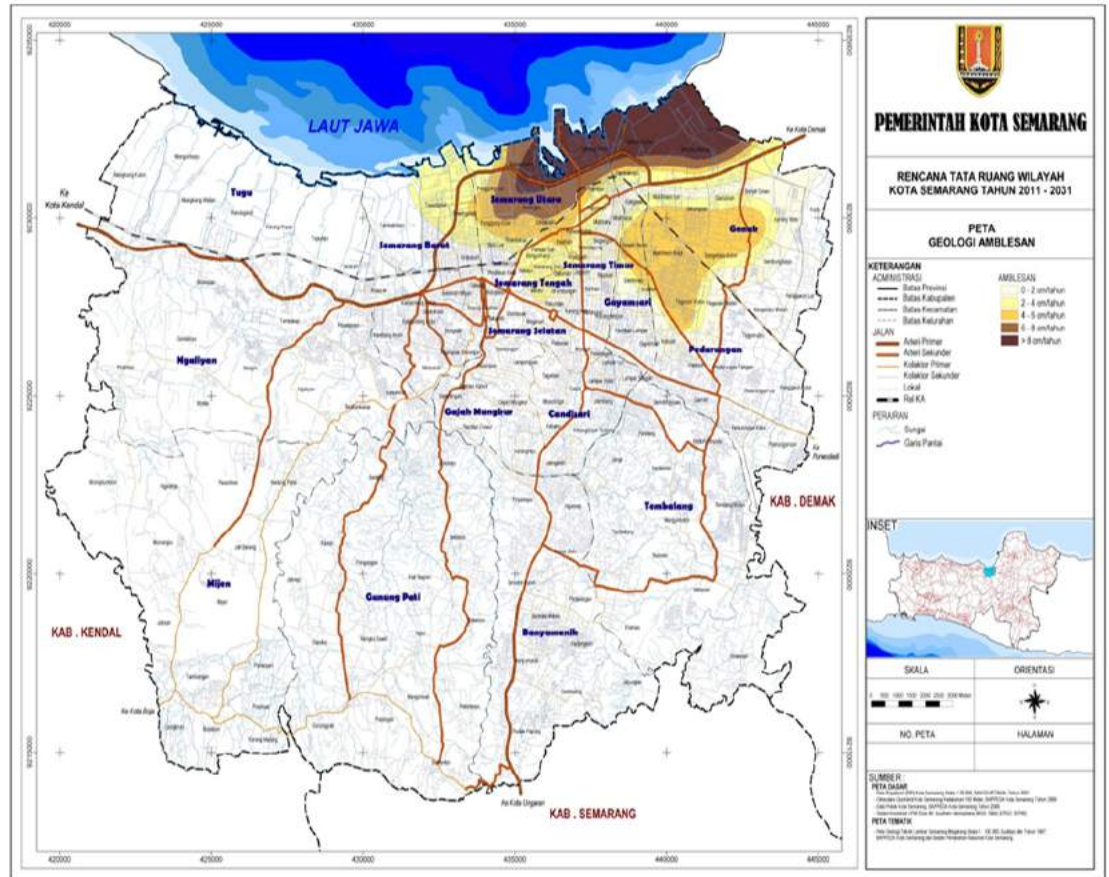
Changes of coastal line in Demak



Changes of coastline in Bedono village Demak



Land Subsidence problems in Semarang



Aims

- Investigate the interlinkages between the implementation of several SDGs, namely goal 13 (climate action), Goal 1 (end of poverty), goal 2 (food security), and goal 11 (making cities and human settlements inclusive, safe, resilient and sustainable).

- What are the institutional challenges to address sea level rise through ICZM, Disaster Risk Reduction and Sustainable Livelihood in Semarang?
- The institutions include: Provincial and Municipal Level in Semarang and Demak include: Bappeda (Local Planning Agency), BPBD (Regional Disaster Management Agency), BBWS (Balai Besar Wilayah Sungai), DLH (Environmental Agency), DKP (Marine and Fisheries Agency), DPU (Public Works Agency), NGOs (wetland International, Oisca, Bintari) , Local community in affected areas (Tambak Lorok, Bedono, Sri Wulan demak)
- How can development and implementation of existing legal and policy frameworks for climate change adaptation be improved for coastal areas in Indonesia?

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Methods

- Literature Review
- Field work Research in Semarang and Demak
- Interviews with government officials, NGOs, academics in Semarang and Demak and local communities affected by SLR and land subsidence
- Workshop and Focus Group Discussion with government officials from different institutions and local communities in Tambak Lorok Semarang
- Training for local government officials in Semarang and Demak on ICZM (collaboration with Macquarie Uni Prof. Shawkat Alam and A/P Peter Davies)
- Observations in 3 villages (Tambak Lorok Semarang, Sriwulan Demak and Bedono Demak)

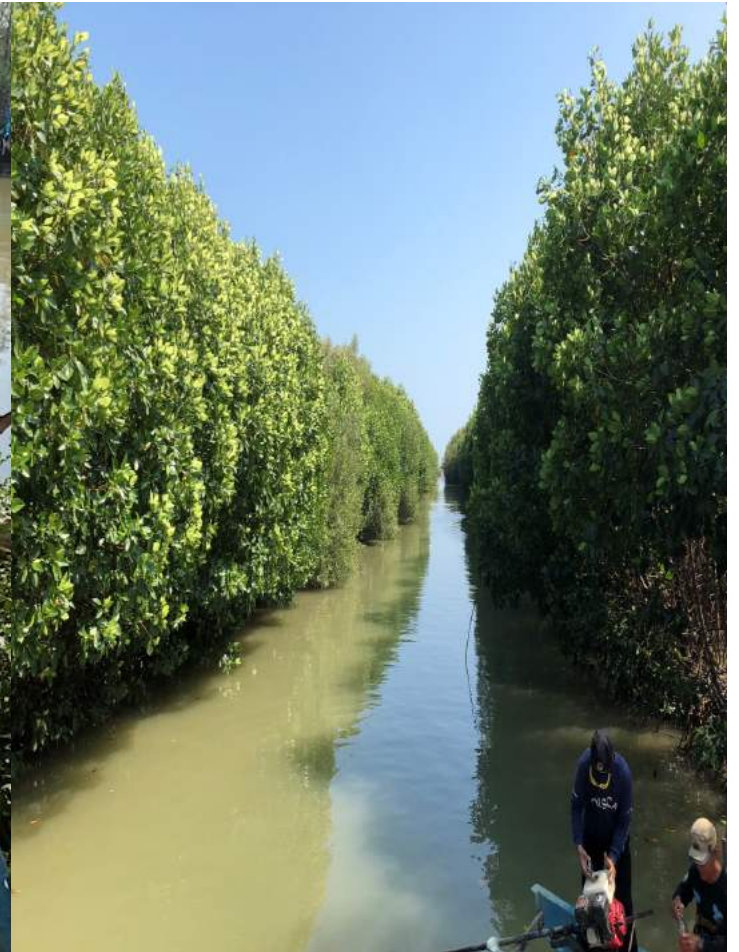




Observation: Bedono Village



Bedono Village



Sri Wulan Village



Tambak Lorok



Legal and Policy Framework of CCA

- ❖ Law No 39/1999 on Human Rights
- ❖ Law Number 24 Year 2007 on Disaster Management
- ❖ Law No 32/2014 on Sea
- ❖ Law No 26/2007 on Spatial Planning
- ❖ Law No 27/2007 on Management of Coastal Areas and Small Island
- ❖ Law No 32/2009 on Environment Protection and Management
- ❖ Law No. 7/2016 on Protection and empowerment of small scale fisher, aquaculture farmer and salt farmer
- ❖ Law No 23/2014 on Local Government

Gaps in Legislation

- Hazard based approach is more dominant, lack of vulnerabilities and resilient approach
- Required multi-level layers of government involvement-lack of coordination.
- Do not address future climate risk ---uncertainty of climate change impact –Environmental migration
- Lack of Involvement and participation of community.

Governance problems

- There are gaps, uncertainty and overlapping laws which hinder effective response to sea level rise threat.
- Sectoral and fragmented legislation has created more fragmented effort to address sea level rise.
- The current legislation is lacking in supporting social justice particularly as it is stated in regulation that the land has been lost due to sea level rise is become government land. In practice the community refused to give the title to the government.
- the legislation is laggard behind the changes of environment. These common constraint include limited financial and human resources and cooperation

Governance Problems (legal and institutional)

- Law No 23/2014 on Local Government
- Under this legislation district level does not have authority anymore to manage coastal areas 0-400 nm. This authority transfer to provincial level
- Problem of authority who manage mangrove plantation
- Problem of RZWP3K and Spatial Planning due to changes of coastal line. (different mapping 2013-2017)
- BNPB, BPBD does not consider coastal flooding as disaster as coastal flooding is continuous phenomenon.

ADAPTATION OPTIONS

- Sea wall and toll road integration

Trase Jalan Tol Semarang - Demak



Data Teknis.

- Panjang Jalan Tol : ± 27 Km (semula ± 24 km)
- Jumlah Lajur : 2 x 3 x 3,5m (final stage)
- Jenis Konstruksi : Viaduct, Bendung, Timbunan dan Pile Slab

Hybrid Engineering (Sediment Trap)

Wetland International



Mangrove Plantation and Rehabilitation

Mangrove plantation Bedono village

This initiative is part of carbon neutral to minimize their carbon footprint and impact on environment by offsetting greenhouse gas emission.





Moratorium of Grand water extraction

- Can not be implemented (problem of PDAM can not provide enough surface water supply)

Conclusion

- Land subsidence, sea level rise and coastal erosion has proven as human security and environmental threat in several coastal areas in Java. It is undermining livelihood, compromising cultural and identity, damaging property, increasing migration
- There is gaps, uncertainty and overlapping laws which hinder effective response to sea level rise threat.
- Sectoral and fragmented legislation has created more fragmented effort to address sea level rise.
- The current legislation is lacking in supporting social justice. For example it is stated in regulation that the land has been lost due to sea level rise is become government land. In practice the community refused to give the title to the government.
- the legislation is laggard behind the changes of environment. These common constraint include limited financial and human resources and cooperation