



Dialogue 6: Green and grey infrastructure and policy responses to coastal erosion

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Context

Over the past several decades, many African coastlines have been facing severe land losses and major damage due to coastal erosion and shoreline loss. This situation affects coastal communities and infrastructure, and hampers economic growth. The negative impacts have increased in recent years as the concentration of population and infrastructure in the coastal areas has risen rapidly. In the majority of cases, the receding shoreline is the result of various factors, some related to natural causes and climate change, but mostly to human activity. Artificial shoreline stabilization, the deterioration of natural formations such as loss of mangroves, the construction of major infrastructure interrupting sediment flow, sand mining and the multiplication of dams deprive these fragile coastal areas of important sediment deposits. The situation is compounded by the lack of coordination of anti-erosion solutions, at local, national and international levels. All these elements aggravate the risk situation and the safety of the population living along the coast. The poorest and most marginalized populations are those most vulnerable to these challenges, and these events are likely to be more frequent and occur with greater intensity in the future.

Climate change effects will aggravate existing physical, ecological/biological, and socioeconomic stresses on African coastal zones. The prediction scenarios indicate an increase in frequency and intensity of meteorological weather events, which will exacerbate coastal erosion. Predictions indicate that a rise in sea level of one meter would result in significant land loss [18,000 km² along the Western African coast] with damage to infrastructure, and displacement of populations. Natural habitats and resources are also at risk from sea level rise.

Causes of Coastal Degradation

Natural

- Waves
- Tides
- Winds
- Near-shore currents ("sand river")
- Storms
- Slope processes
- Sea level rise
- Changing precipitation patterns
- Higher temperatures
- Increased salinity of coastal estuaries

Anthropogenic

- Construction of ports
- Construction of groins and jetties
- River water regulation works
- Construction of sediment-trapping upland dams
- Hardening of shorelines with seawalls or revetments
- Destruction of mangroves and other natural buffers
- Sand mining or water extraction
- Marine and coastal pollution
- Onshore and offshore oil exploration

Solution Options

Policy/Regulatory

- Land-use planning
- Enforcement of ban on sand extraction and promotion of alternative options (e.g., crushed basalt rock in Mauritius)
- Strategic retreat / relocation
- Implementation of Early warning system

Green Infrastructure

- Beach nourishment
- Dune restoration
- Mangrove restoration
- Barrier Island restoration
- Small scale edging and sills
- Restored oyster/shell fish reed
- Coral reefs
- Restored maritime forest
- Restored wetland

Hard Infrastructure

- Groynes
- Sea wall
- Revetment
- Breakwater
- Levees

Solutions, Trade-offs and Prioritization

The following information should be considered for each proposed solution, to help identify and articulate tradeoffs (if any) and prioritize possible interventions against coastal erosion.

- Pros
- Cons
- Risk Reduction Performance
- Resilience to predicted climate change impacts
- Cost: related to construction, Operation and maintenance, lifecycle costs
- Downstream impacts (both locally and regionally)
- Examples of successful use locally and globally

Questions to consider in this session *(please see attached maps)*

1. In the case study presented, what solutions do you propose to deal with the problems of coastal erosion?
2. How can investment priorities be selected for this coastline? *(Against a backdrop of growing demographic pressure on coastal resources as well as climatic and environmental instability?)*
3. What is the role of different stakeholders (in particular, private sector, communities and government) in protecting this coastline?
4. What support/information/advice can the various stakeholder provide to each other?
5. Is there any other information/resources required to address these challenges - e.g. human capital, political will, finance, science and data – and how these best be leveraged for African coastlines?

