



## Urban Resilience and Green Infrastructure

*Planning for a Sustainable City in Saint–Louis (SENEGAL)*

Ibrahima THIAM, Regional Director Africa



## Outline

- Wetlands International
- Saint – Louis Background
- Floods Threat in Saint Louis and Breach
- Impact on Coast and Communities
- Mangrove Restoration Experience
- Planning for Sustainable City: Needs for Green Infrastructure

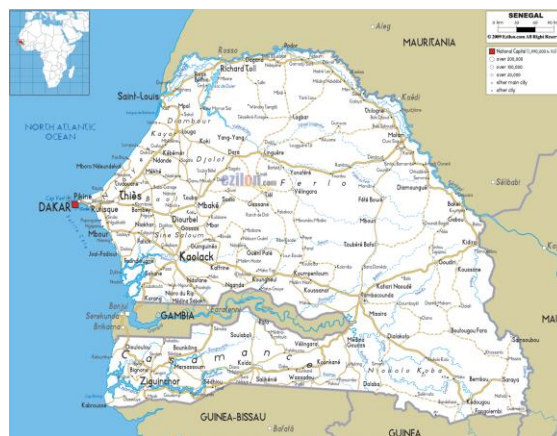
## Wetlands International

- Wetlands Conservation / restoration
- Experience : 60 years
- Waterbird Census
- Disaster risk reduction
- Climate Change Adaptation
- 17 bureaux in Europe Africa, Oceania and South America
- Head Office in Wageningen, aux Pays-Bas.
- AFRICA PROGRAM
- Regional Office in Senegal since 1998
- Water :(Coastal zone + basin level)
- Biodiversity (migratory waterbirds, manatee, mangroves)
- Water, Sanitation and Hygiene
- Climate change and disaster risk reduction

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## Saint – Louis Background



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## Saint – Louis Background

- Located in Senegal Delta = important pole of agricultural development (food security).
- Wetlands ecosystems (Djoudj National Park, Natural Reserves etc.) relatively degraded.
- High competition for water access in the Senegal Delta (small farming, agribusiness etc.)
- Coastal vulnerability to flooding and erosion due to its position.
- Increase of aquatic invasive species



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## Floods Threat in SL and the Breach

Senegal river managed by Manantali and Diama dams (built since 1988)

Saint-Louis is in the Senegal Delta, downstream near to the embouchure (outfall).



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## Floods Threat in St Louis and the Breach

- This region is threatened in the raining season when outflow is very high. The sluiceway are open in order to preserve dams.
- To avoid serious flooding threats in 2003, a breach was opened to let the water flow to the sea.
- From 10 m at that moment, the breach reached more than 1 km a year after.



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## Negative Impact : Coast and Community

Breach affected livelihoods of populations in downstream Saint-Louis:

- Soil salinization, decrease of income generating activities such as fishing, horticulture.
- Lack of drinking water and development of waterborne diseases.
- Loss of infrastructures and human habitats,
- Economics and social impacts.



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## Mangrove Restoration Experience

Goal: to restore degraded wetlands while generating income



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## Mangrove Restoration Experience

- 35 ha restored, with forest department and local communities.
- Revenue generation with oyster production
- Improved coastal protection



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## Planning for Sustainable City: Needs for Green Infrastructure

### Advantages of Green Infrastructures

- Compatible to community and ecosystem based adaptation.
- Builds on biodiversity and ecosystem services.
- Sustainable use, conservation and restoration of ecosystems provide service to community.
- Reduced costs conventional hard ingeniering.
- Multiple services from a healthy ecosystem.

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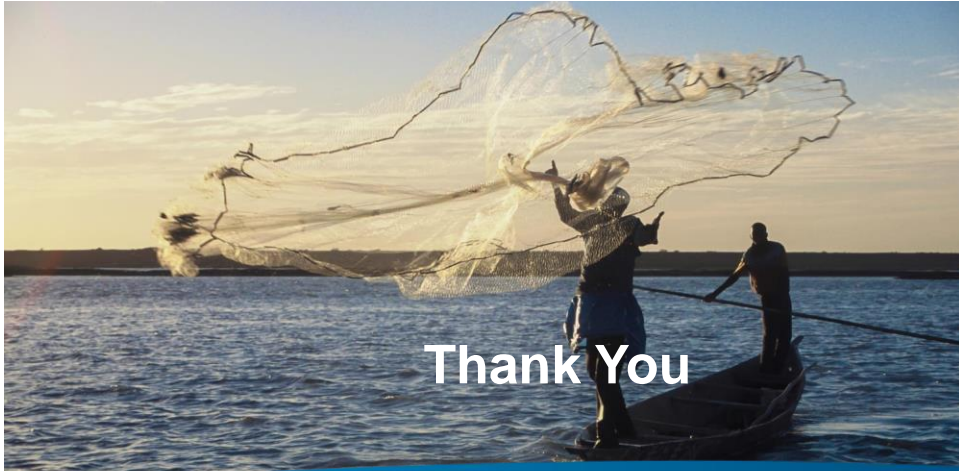
## Planning for Sustainable City: Needs for Green Infrastructure

### Potential Approach

- Use TEEB study to build a case.
- Take into account ecosystem based approach.
- Look at tradeoffs in needs of different stakeholders (ministerial departments, local government, CBOs/NGOs, private sector etc.).
- Combine natural infrastructure with hard engineering.
- Explore international experience in coastal management – re solution to the breach.
- Challenges: access to resources, expertise, political buy in...
- Dutch and other experience / know how ?

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Thank You

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