Conservation and management of coastal resources as a potential adaptation strategy for sea level rise

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Programme Location: Krishna Delta – Coastal Andhra Pradesh

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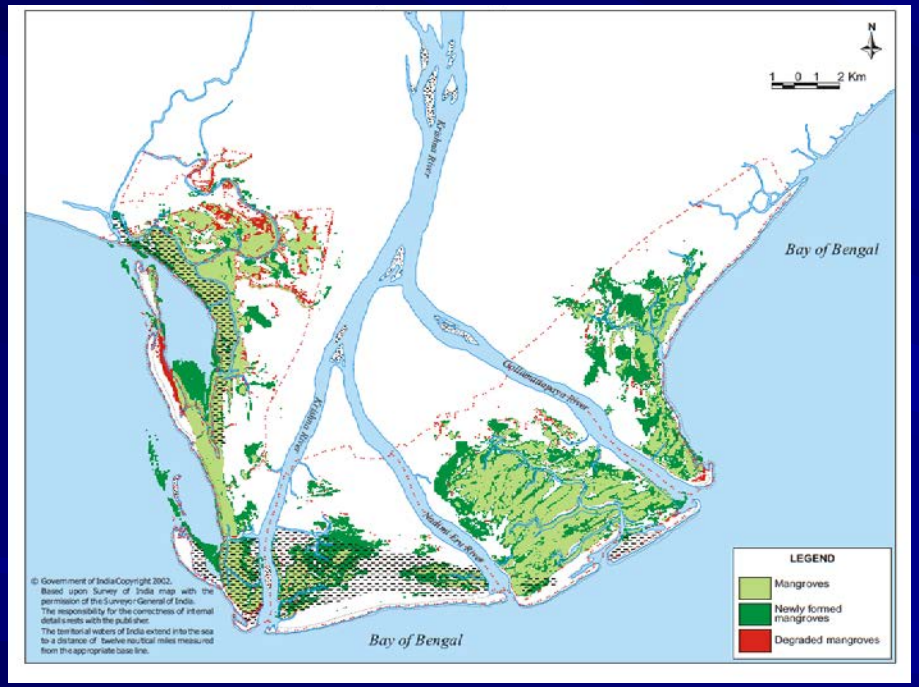


Krishna delta covering an area of about 4600 sq. km

Elevation of the delta lies between the sea level and 15 m inland

Tropical sub humid climate with hot humid summer and mild winter

Annual mean rainfall is about 1250 mm; 60 to 70% of the rainfall during June to Sept

4.5 million people

Landuse: 55% under agriculture
9% forest including mangroves
0.8% aquaculture

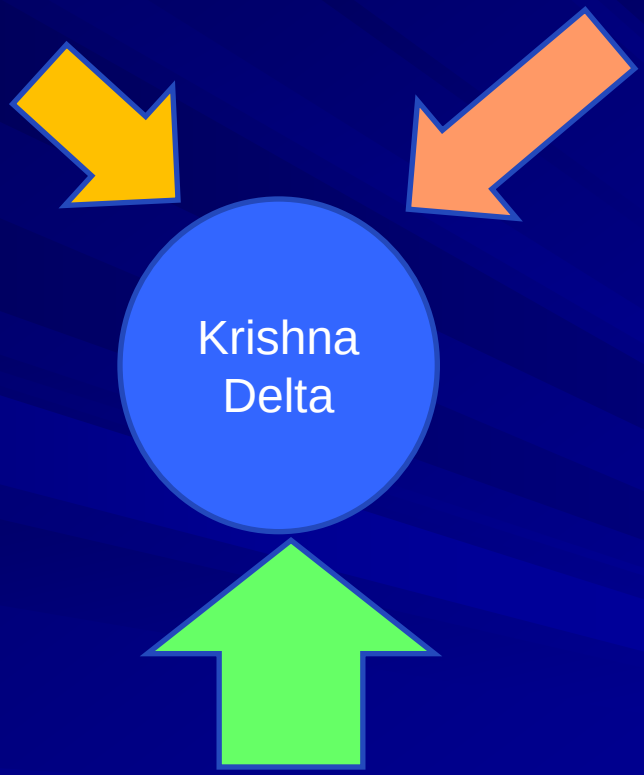
Programme context - Environmental Vulnerability – coastal belt

Atmospheric temp

Maximum temp will increase by 1°C by 2020 and 2°C by 2050;

Minimum temp by 2°C and 4 °C

Impact: will increase water salinity and cause DO problem in the ponds



Sea level Rise

Already increased by 1 cm per decade since 1900

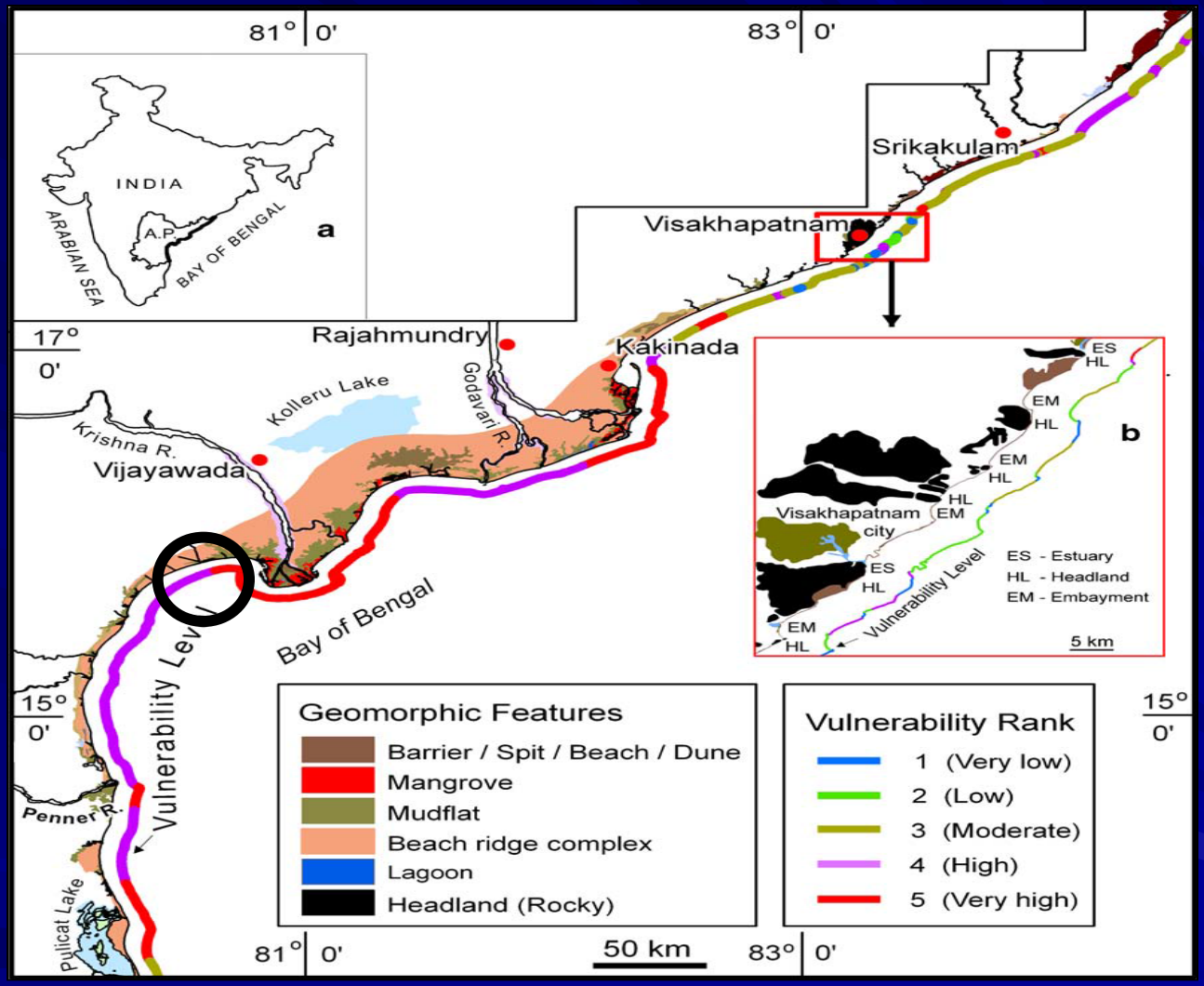
Predicted: 15 to 35 cm by 2050 and 46 to 59 cm by 2100 along the Indian coast

894 sq. km land will be salinized – in Krishna and Godavari delta

1.29 million people will be displaced

Cyclone: increased frequency and intensity due to CC
Hadley Centre for Climate Prediction Research;
Impact: property and human loss; salinization of land and water
Loss to infrastructure;

Physical Vulnerability rank to SLR - very high - Rao et al 2008



Five physical variables : geomorphology; slope; shoreline change; wave ht; spring tidal level

Programme context - Socio-economic Vulnerability – coastal belt

4.5 million people; 2.26 million male and 2.25 million female

Male literacy 78% female literacy 69%

DRDA – 17% of the population poorest among poor
37% poor
45000 marine fishers – all of them belongs to below poverty line

No systematic study on how these people are vulnerable to CC induced issues

Speculative: Salinization of land and water resources → less productivity
loss of income and employment → migration

State Action Plan on Climate Change of Andhra Pradesh

Proposed Major Interventions to reduce vulnerability of coastal areas and population to climate induced issues.

- Cyclone shelters:
- Beach nourishment/ recharging
- Dikes/Surge barriers /sea walls
- Port upgrade (raising elevation)

- Restoration and plantation of new mangrove belts across the coast. Discouraging aquaculture and shrimp farming activities in mangroves (IMFFS farms use only abandoned shrimp farms; increase mangrove cover)

- Freshwater injection/recharge
- Upgrade drainage systems
- Waste disposal to ocean: Stricter norms

IPCC considers mangrove as first line of defense and soft solution to SLR

- Mangrove plants have the capacity to trap sediment
- Trapped sediment along with vegetation form living platforms
- These living plat forms adjust to changing sea level since rise in sea level in a year is comparatively small; it is possible only under two conditions

  Sediment supply from river discharge should not be stopped

  Mangrove forest should be disturbed

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Overall goal is to enhance adaptive capacities of the local community and other stakeholders by strengthening their institutional mechanism, restoration and management of coastal resources and building livelihood asset

Objectives

- To assess the baseline situation to monitor the vulnerabilities due to predicted climate change on natural and social systems and capture the current coping mechanisms and adaptive strategies
- To train and built the capacity of the stakeholders on adaptive capacities and strengthening livelihood activities
- To integrate ecological security and livelihood security of coastal ecosystems and dependent communities through establishing mangrove bioshield
- To develop and demonstrate replicable models of seawater based agro-aqua farming system as a potential means to adapt climate change effects and sea level rise

Process

Situation Analysis – Consultative process

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Selection of project hamlets

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Project Proposal development

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Orientation of project to the community

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Participatory Rural Appraisal

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Formation of Village Level Institutions

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Preparation of Joint Micro plan

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Joint implementation and monitoring

Project villages

Programme components

Component 1: Community mobilization and organization

Component 2: Capacity building for coastal protection and livelihoods

Component 3: Restoration of mangrove areas for coastal protection

Component 4: Demonstration of Mangrove based Fishery Farming Systems

Component 5: Knowledge management for Improved Coastal Protection

Programme Components, outcomes and outputs

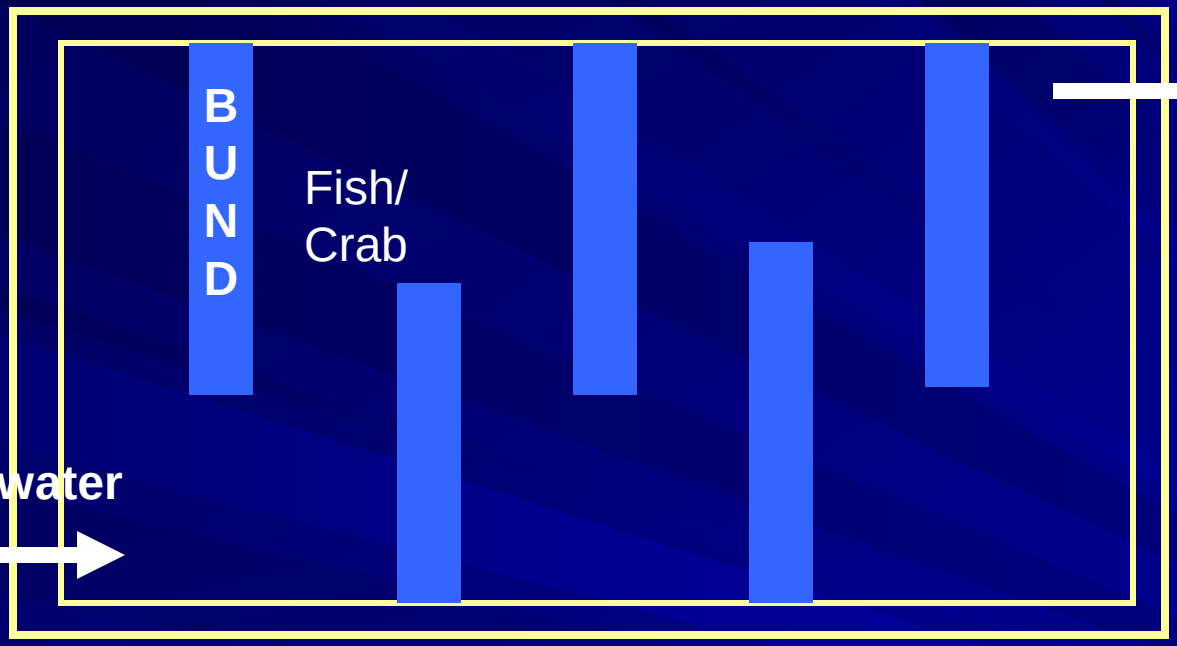
PROGRAMME COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES
Component 1 Community mobilization and organization	1.1 Gender balanced village level institutions formed in Sorlagondi, Nali and Basavanipalem villages	Improved community organization to undertake climate change adaptation measures
	1.2 1500 people oriented to CC, SLR and adaptive capacity concepts and measures involving mangroves	
	1.3 Annual micro plans prepared for optimal utilization of resources	
Component 2 Capacity building for coastal protection and livelihoods	2.1 200 people trained on mangrove restoration, IMFFS and fish culture	Trained stakeholders on coastal protection and livelihoods
	2.2 50 farmers including at least 20 women trained in IMFFS	

PROGRAMME COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES
Component 3 Restoration of mangrove areas for coastal protection	3.1 200 ha of replanted mangrove area close to two villages for future coastal protection	Restored and healthy mangrove replanted area contributing to protection of coastal erosion sea level rise
	3.2 One central mangrove nursery established serving three villages	
Component 4 Demonstration of Integrated Mangrove and Fishery Farming Systems	4.1 Two models of IMFFS demonstrated with the participation of local community and stakeholders	Established demonstration sites of integrated mangrove fishery farming system for sustainable livelihood of local people
	4.2 Two culture of fish or prawn or both undertaken in the IMFFS farms per year	
	4.3 Cage /Penn Culture of fishes	Livelihood for landless

Restoration of Mangroves

Degraded Mangrove area near Basavaipalem

Integrated Mangrove-Halophyte - Fishery Farming System

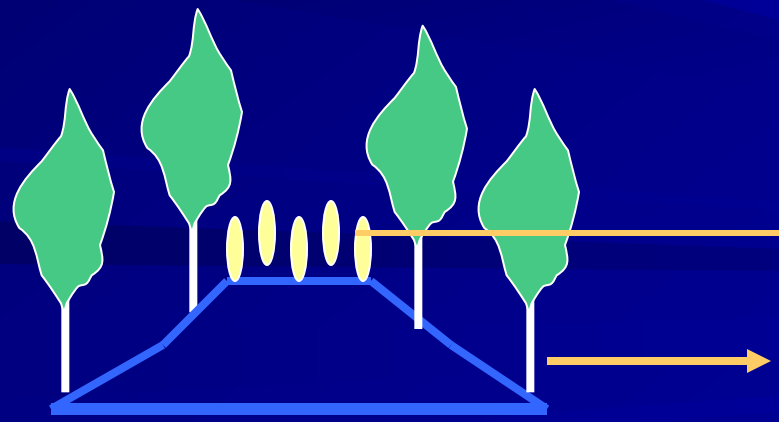


Zero energy

Tidal fed ponds

No artificial feed

No chemicals

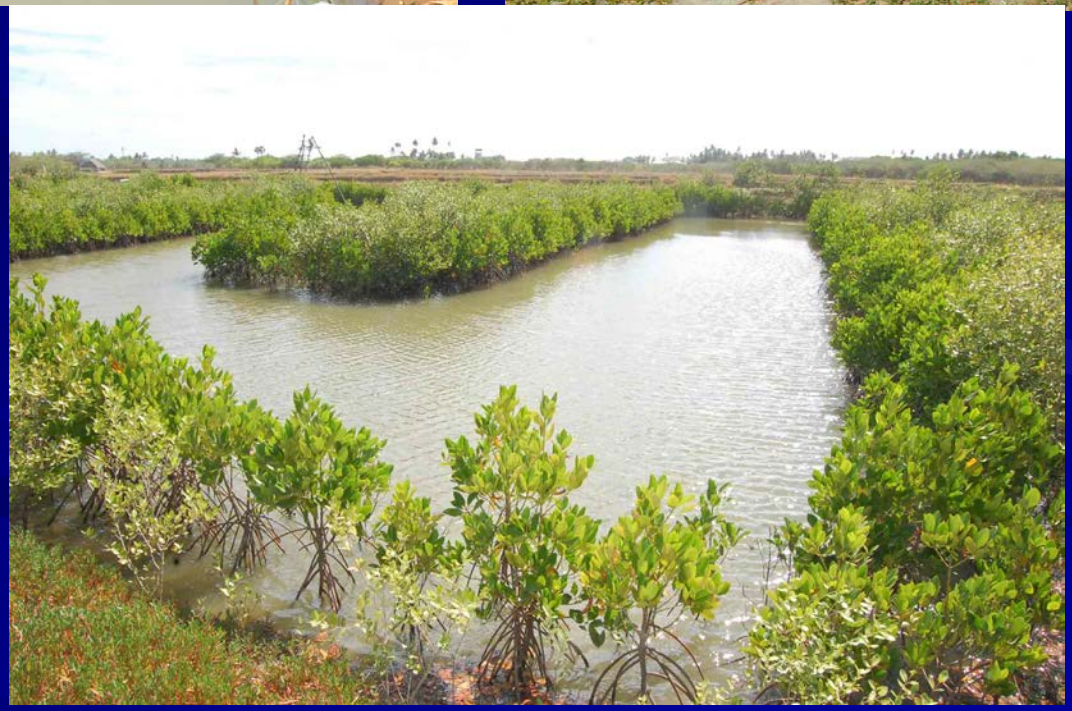


Halophytes can also grown as cash crops

IMMFS site - Nali

Abandoned shrimp farms in Nali

Integrated Mangrove-Halophyte-Fishery Farming System



PROGRAMME COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES
Component 5 Knowledge Management for Improved Coastal Protection	5.1 Resource materials prepared for dissemination among various stakeholders	Prepared and published materials on ways to upscale coastal protection and livelihood systems in mangrove areas
	5.2 Stakeholders brought together and knowledge on CC, SLR, Vulnerability and measures to improve adaptive capacity shared	

Thank you