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Climate Resilient Coastal Infrastructure Development in Bangladesh

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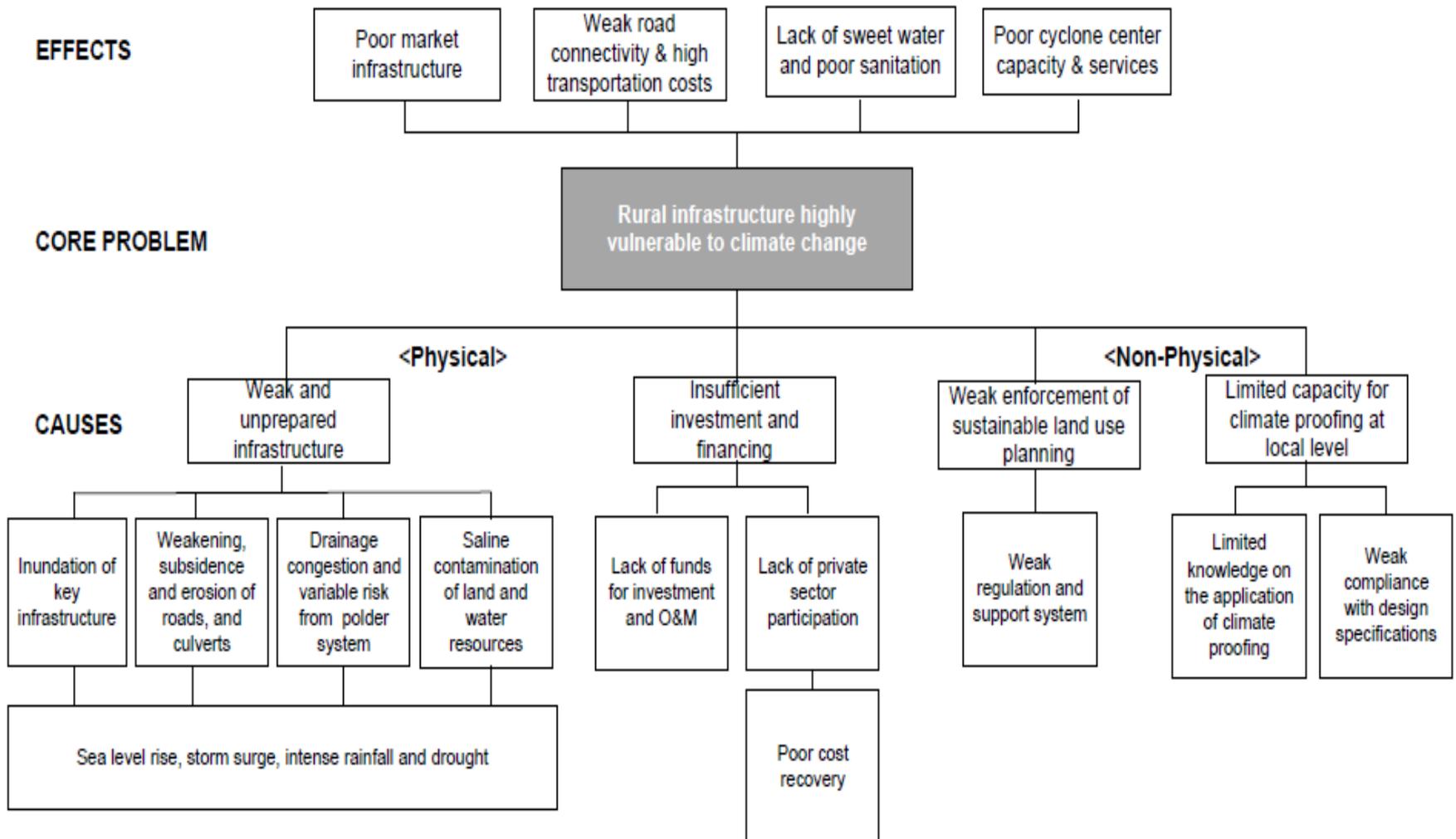
Climate Change Risks

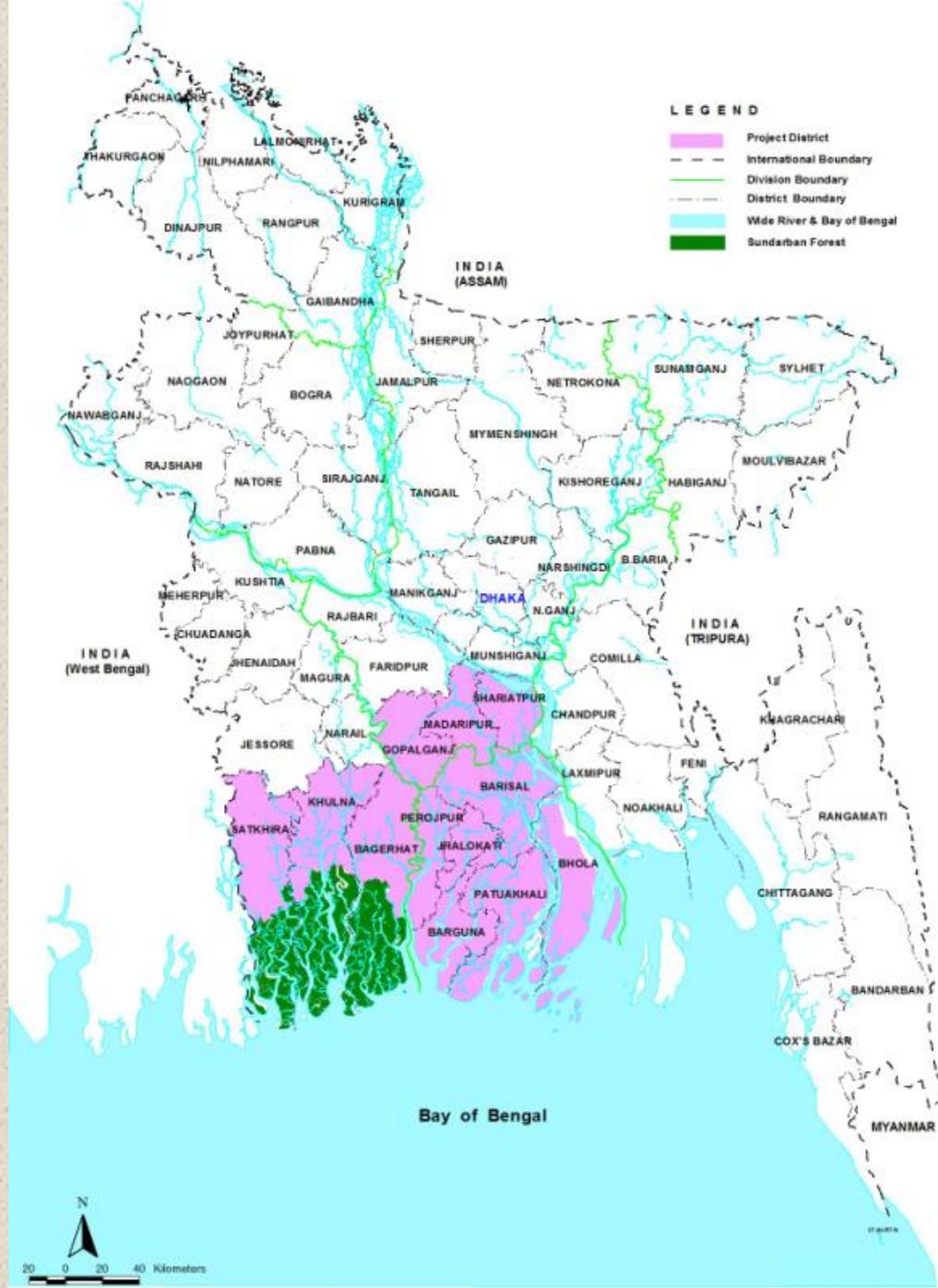
- Bangladesh is most vulnerable
- 30%-50% country flooded most years
- By 2050, climate change impact:
 - Could make an additional 14% of the country extremely vulnerable
 - Dislocate 35 million people in coastal areas
 - Inundate 90% of roads

Coastal Infrastructure Vulnerability

- Increase in temperature
- Increase of monsoon rainfall
- Sea level rise
- High winds
- Increase of the frequency of strong cyclones/storms

Problem Tree





Coastal Climate-Resilient Infrastructure Project (CCRIP)

CCRIP Objectives

- Impact: Improved livelihoods in coastal districts
- Outcome: Enhanced climate resilience of infrastructure
- Outputs:
 - (i) improved road connectivity
 - (ii) improved market services
 - (iii) enhanced climate change adaptation capacity

CCRIP Photos -I



CCRIP Photos -II



CCRIP Photos -III



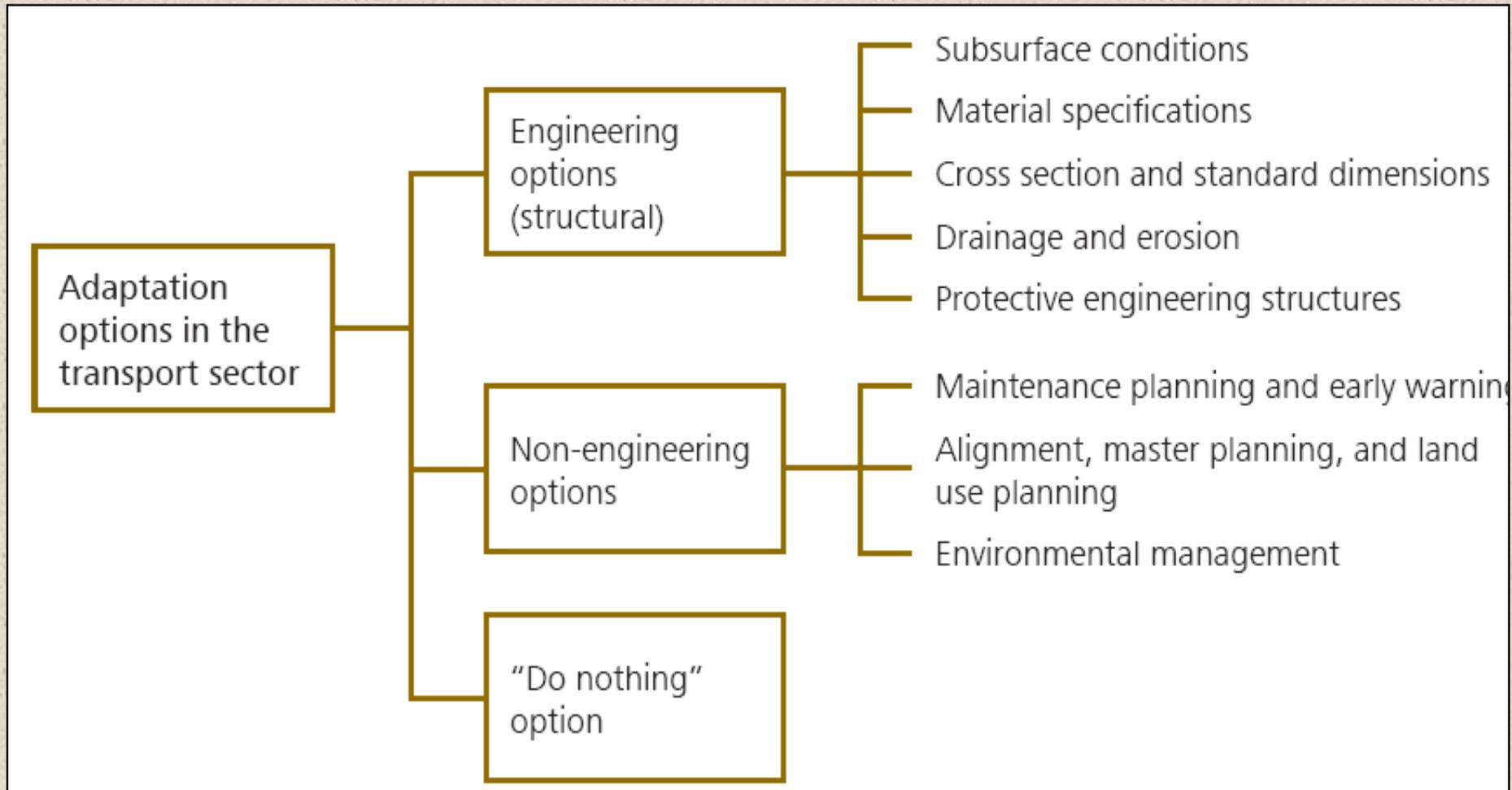
CCRIP Photos -IV



CCRIP Photos -V



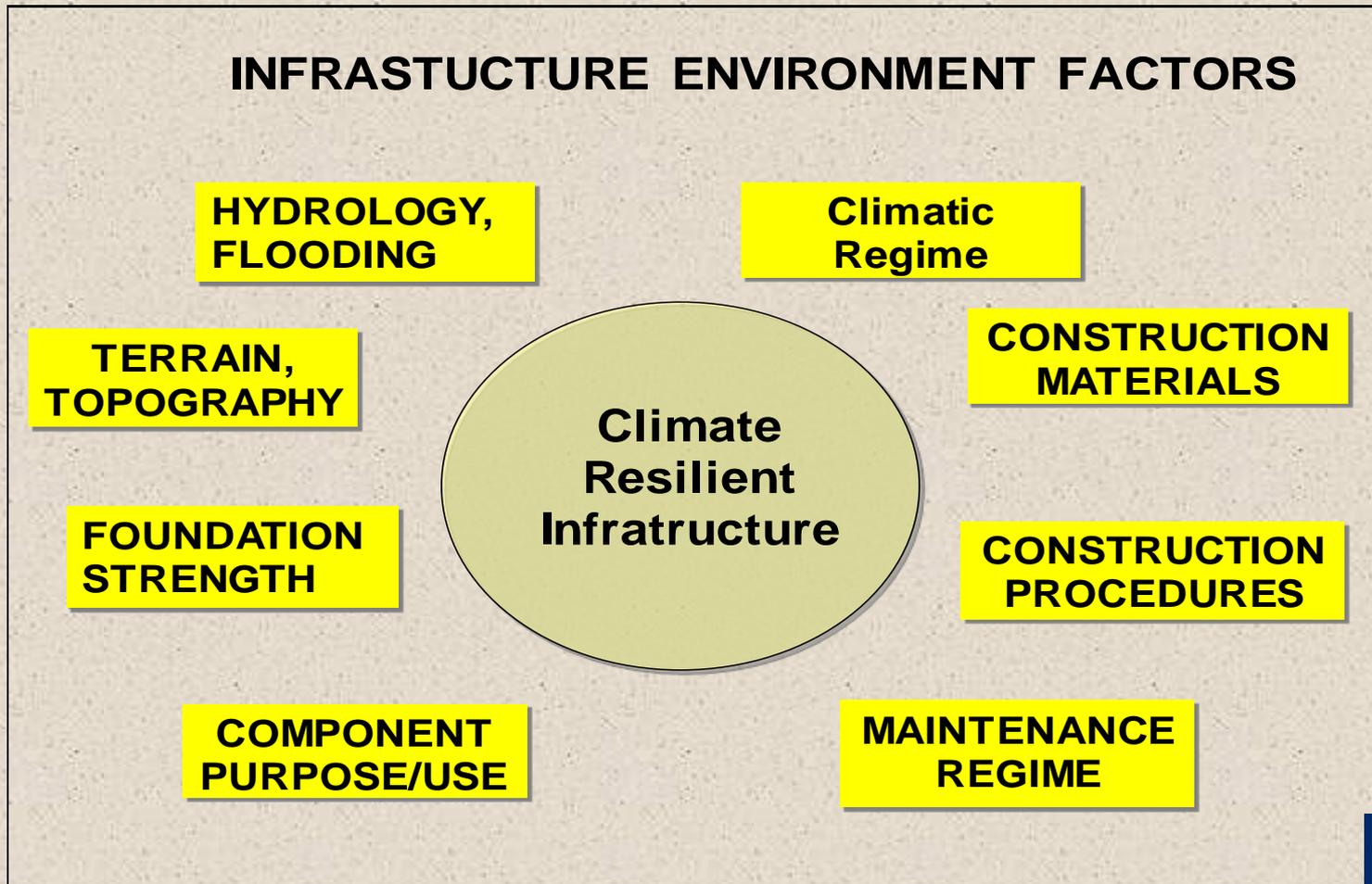
Adaptation Options



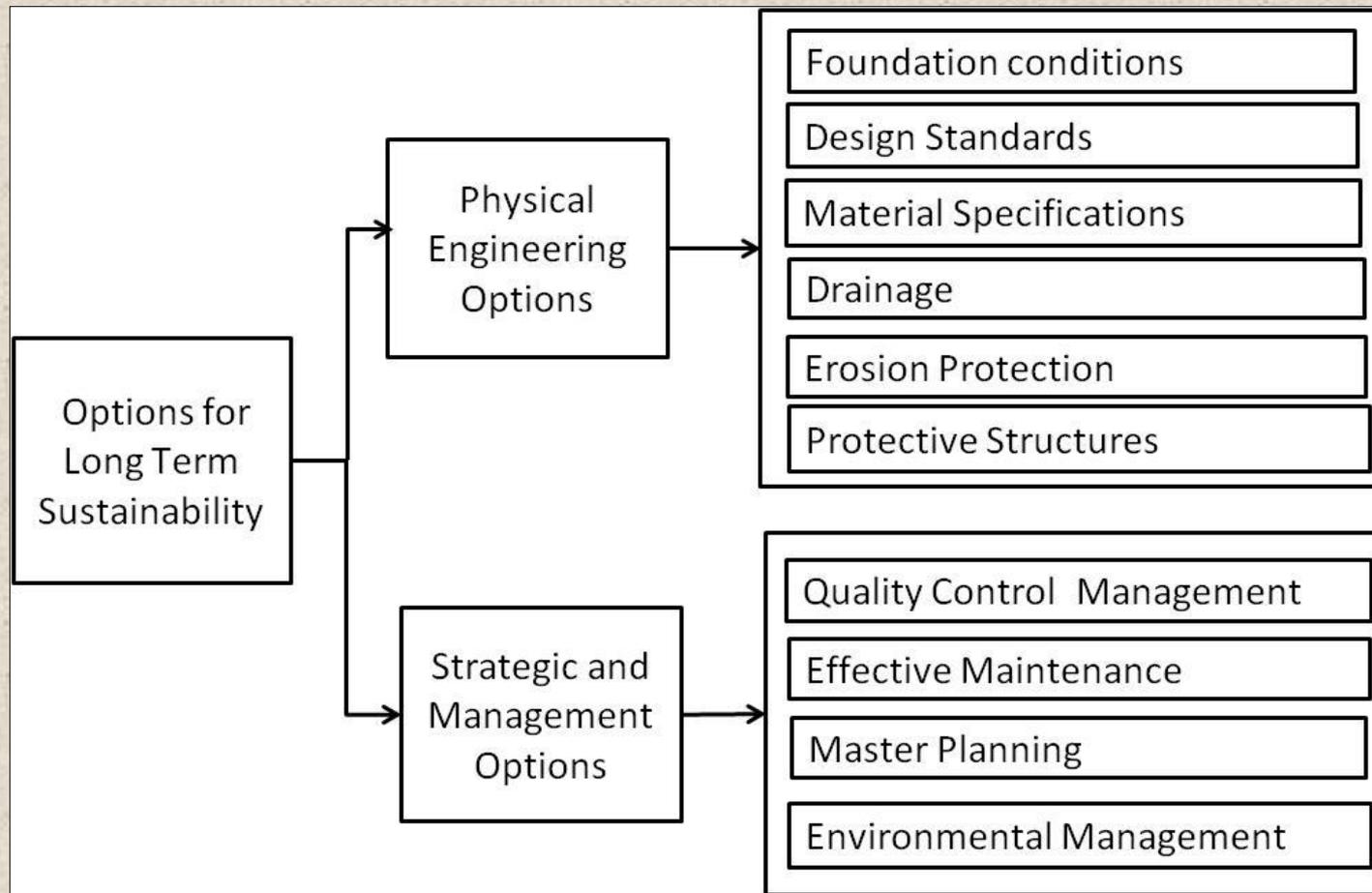
The Challenge

- The challenge is to ensure that the coastal infrastructure is made more robust and more resilient to climatic events.
- This risk becomes more acute when considering the possible impacts of increasing severe weather events as a consequence of future climate change.

Infrastructure Environment



Response to Challenge



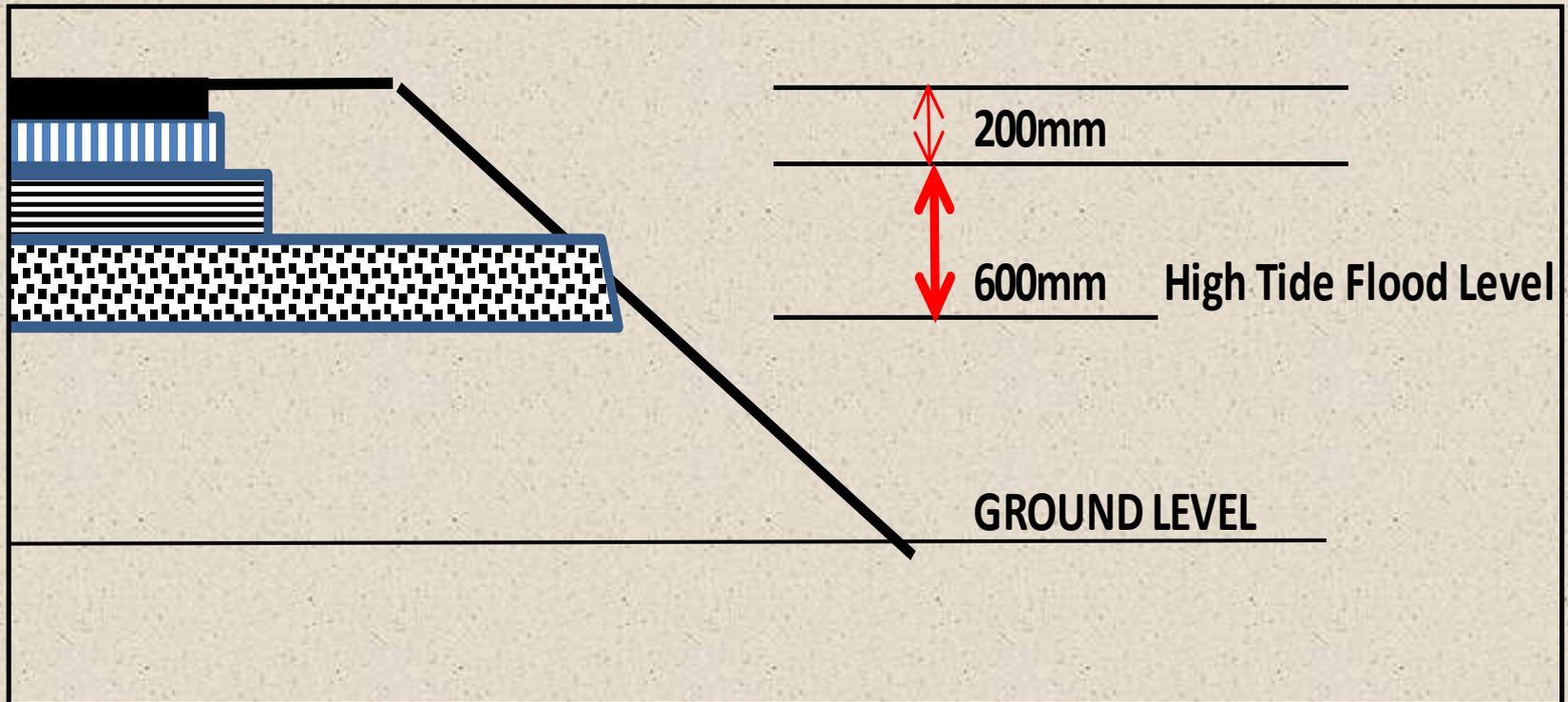
Rehabilitation to Counter Future Climatic Impacts

- Appropriate road crest levels
- Improved pavement drainage
- Increased cross drainage
- Embankment protection appropriate to overtopping
- Increased quality control of appropriate construction procedures

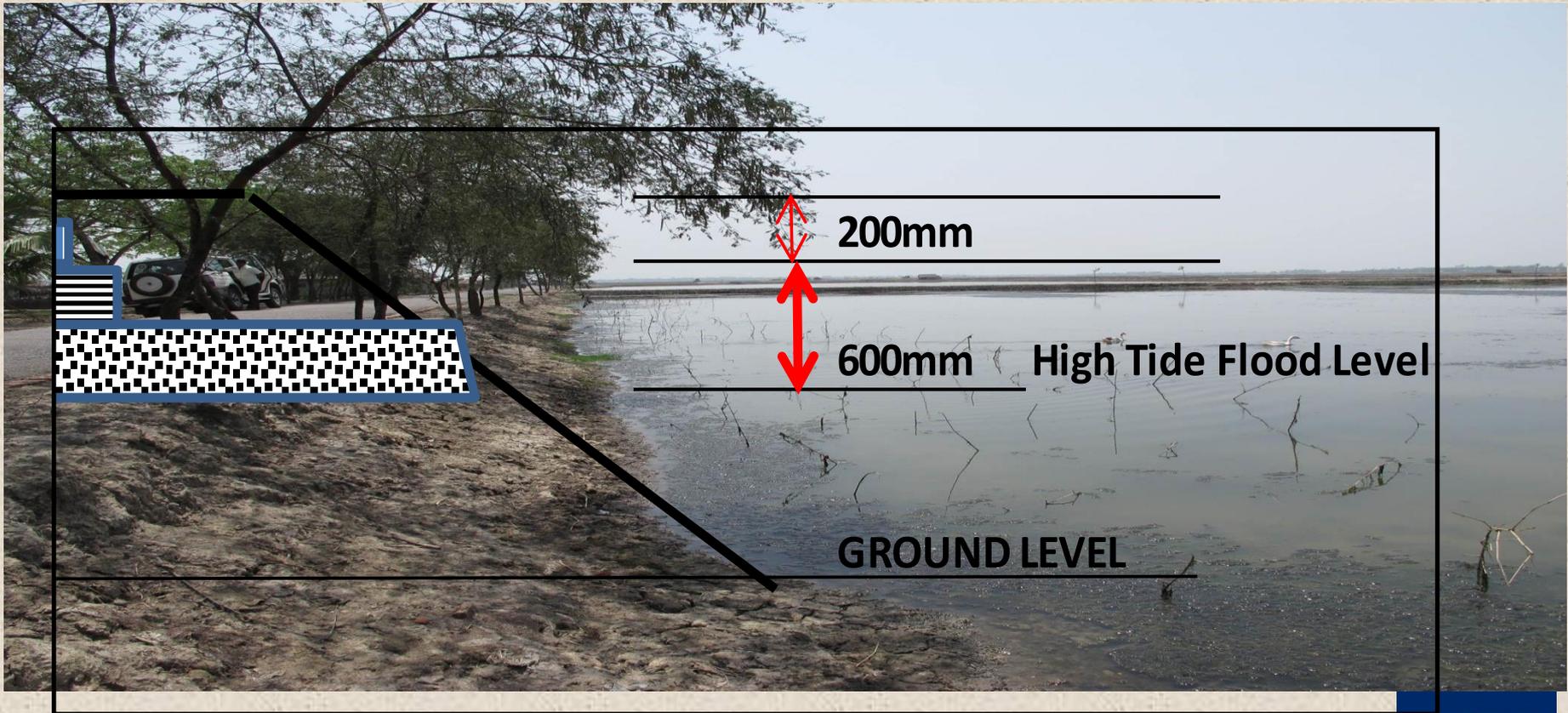
Relative Sea Level Rise and Subsidence

- Relative SLR 140mm
- Subsidence 60mm
- Total effective SLR 200mm

Climate Resilience Pavement Levels - I



Climate Resilience Pavement Levels -II



Embankment Protection



Growth Center and Markets

- New market sheds; concrete base plinths above the existing maximum normal monsoon high tide level plus effective SLR with an additional 250mm freeboard
- The central market area to be paved to be at maximum sea level rise plus 100mm freeboard
- Access into the market to be above normal flood level

Cyclone Centers

- A plinth level in excess of the effective SLR level plus an freeboard of 500mm
- Strict compliance with relevant building codes
- Ensuring the associate access road is upgraded to the equivalent of village road climate resilience

Quality Control

- Lack of quality control in construction
- Poor construction negates climate resilience



Incremental Cost of Climate Resilience

	Tk/Per km	
	LGED	Climate Change
Pavement	7,696,688	8,120,006
Earthworks Preparation	125,000	162,500
Additional Earthworks	750,000	960,000
Earthworks Protection	202,080	2,450,800
Total	8,773,768	11,693,306

Thank you

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