

4th Asia Pacific Adaptation Forum
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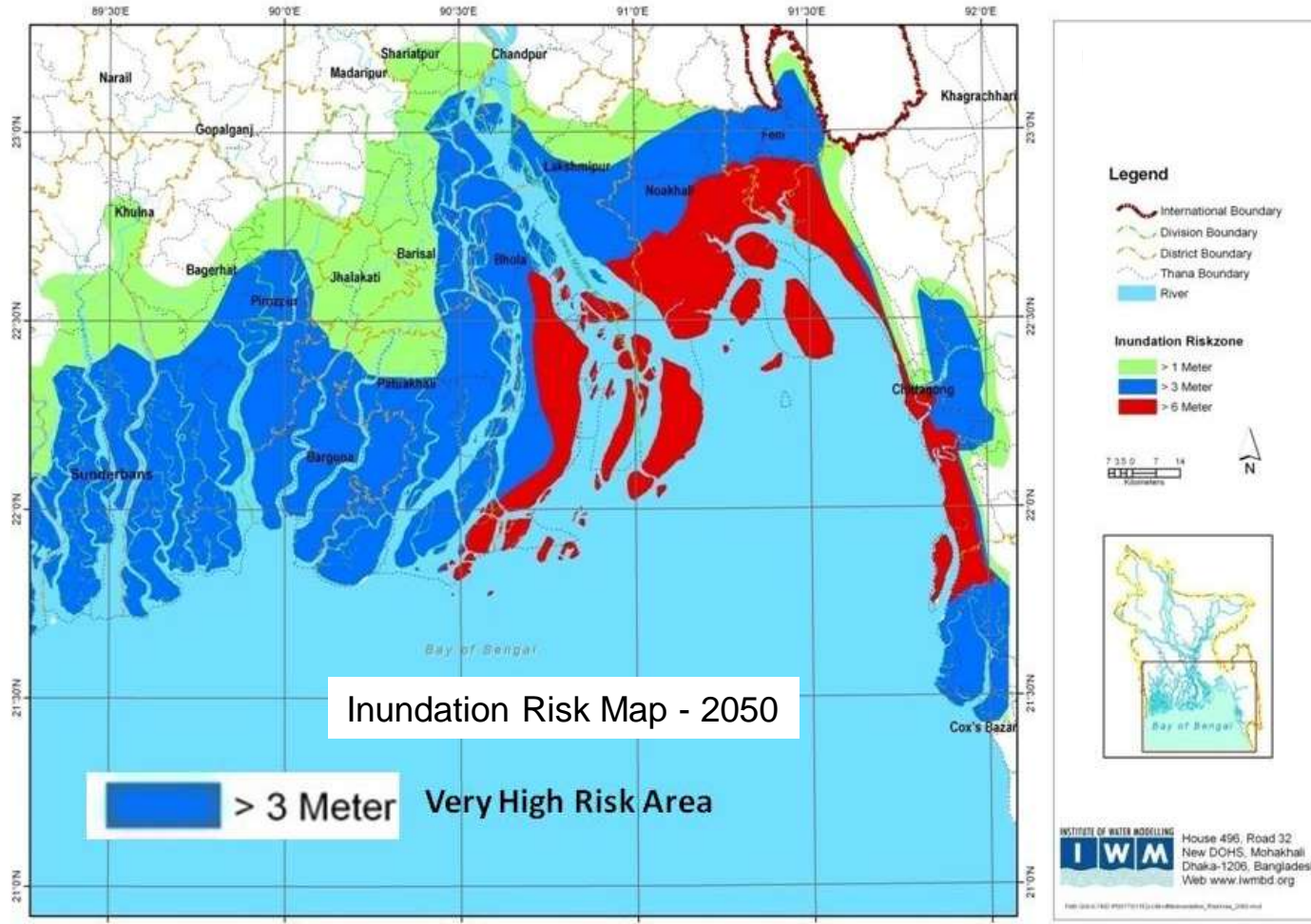
Strengthening Resilience of Water Supply and Sanitation to Climate Change in Coastal Towns of Bangladesh

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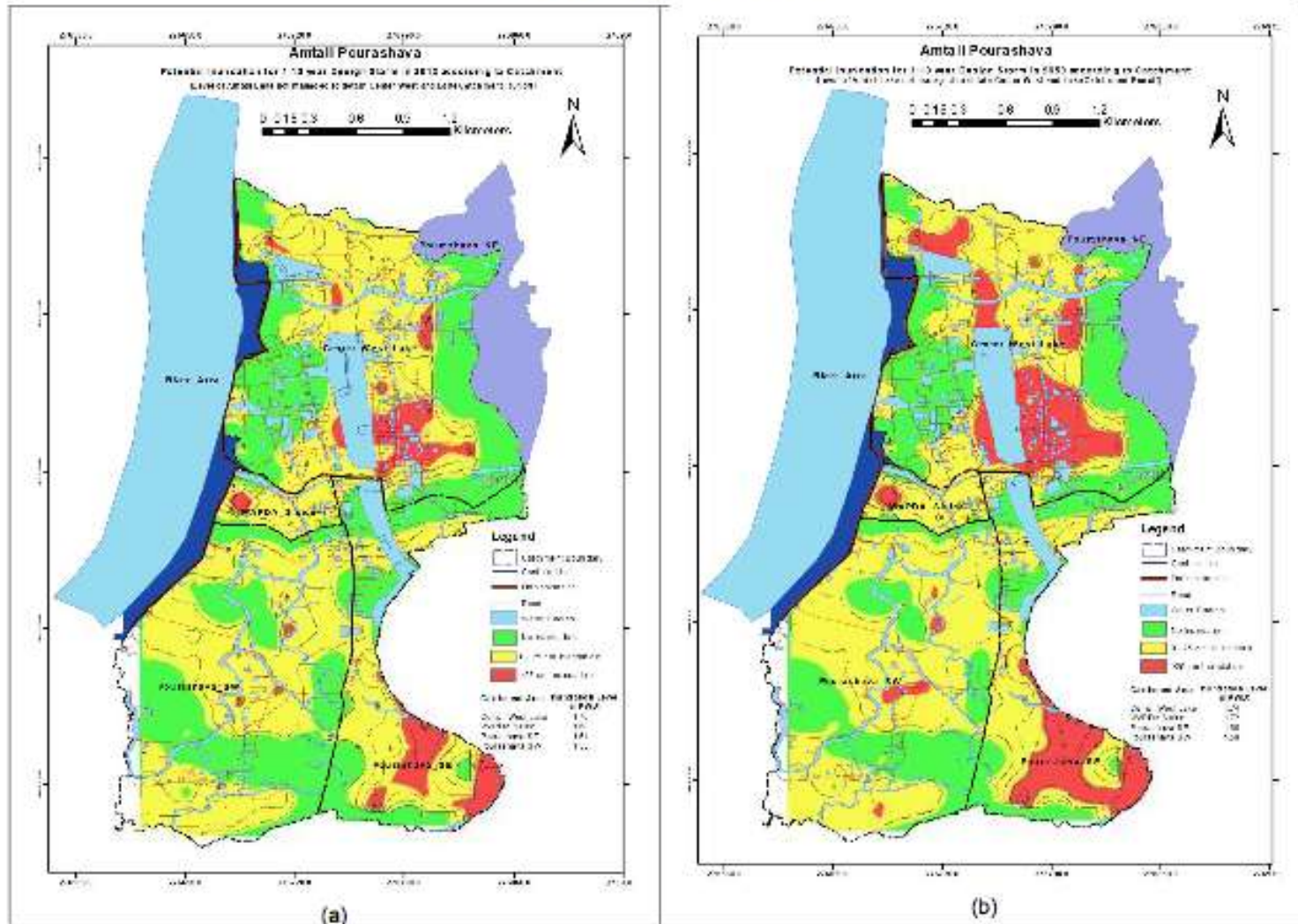


Storm Surge Inundation Depths in 2050: Very High Risk Areas

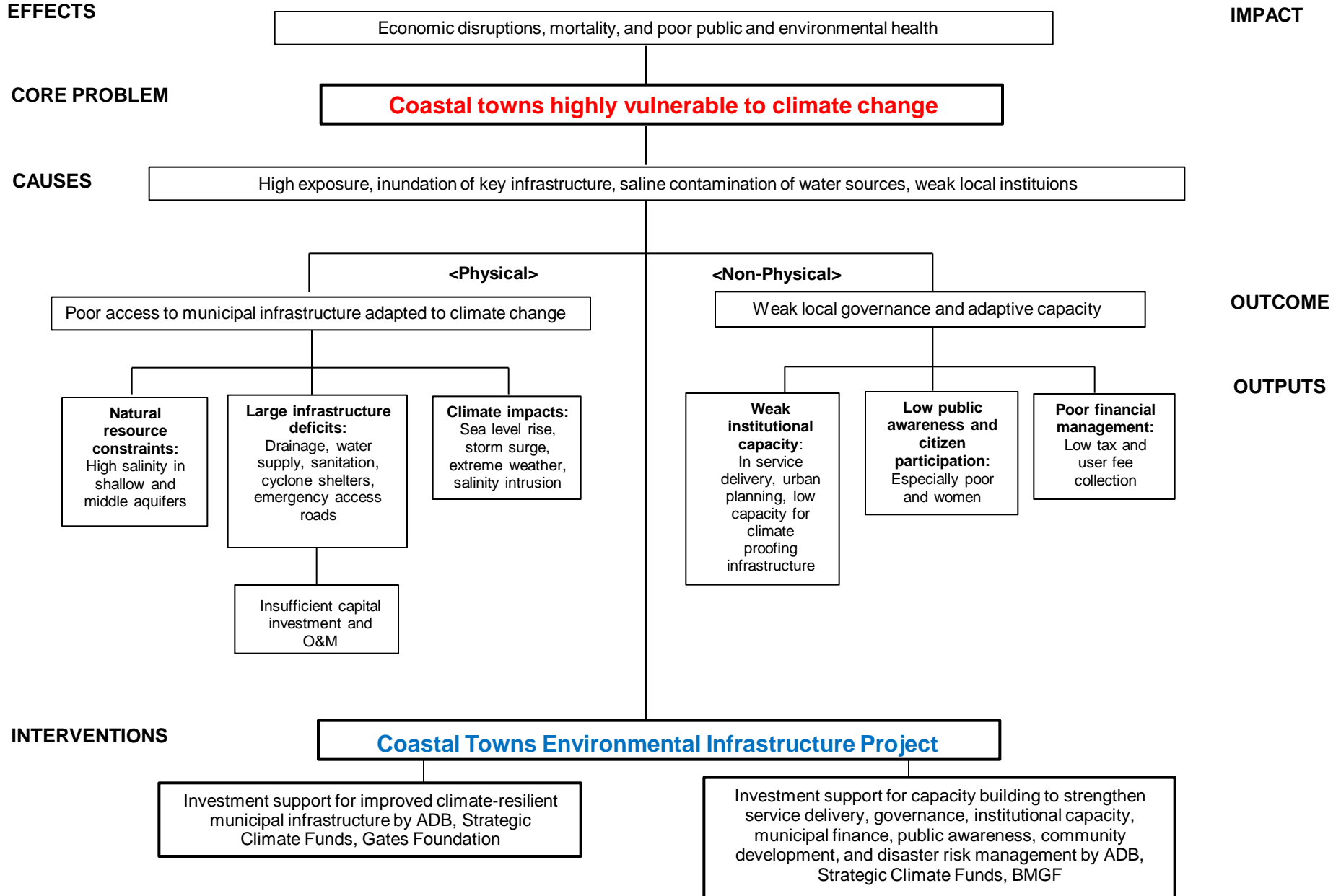


Inundation Mapping in Amtali Town – Year 2050

Figure III.5: 1:10 Year Design Storm Inundation due to Drainage Congestion in Amtali, in 2012 (a) and 2050 (b)



PROBLEM TREE



Coastal Towns Environmental Infrastructure Project (CTEIP)



Project Objectives

- To improve climate and disaster resilience through the rehabilitation and construction of critical urban infrastructure in eight vulnerable coastal towns of Bangladesh. Infrastructure will be designed considering climate projections for the year 2040.
- To strengthen institutional capacity, local governance, and public awareness for improved urban planning and service delivery considering climate change and disaster risks.



Performance-Based Investment

- Link investments to demonstrated performance in governance reforms:
 - Strengthened climate change-disaster resilience
 - Citizen participation and social accountability
 - Improved municipal planning, service delivery, and O&M
 - Strengthened municipal financial management



Participator community hazard mapping in Galachipa Town

Financing Plan

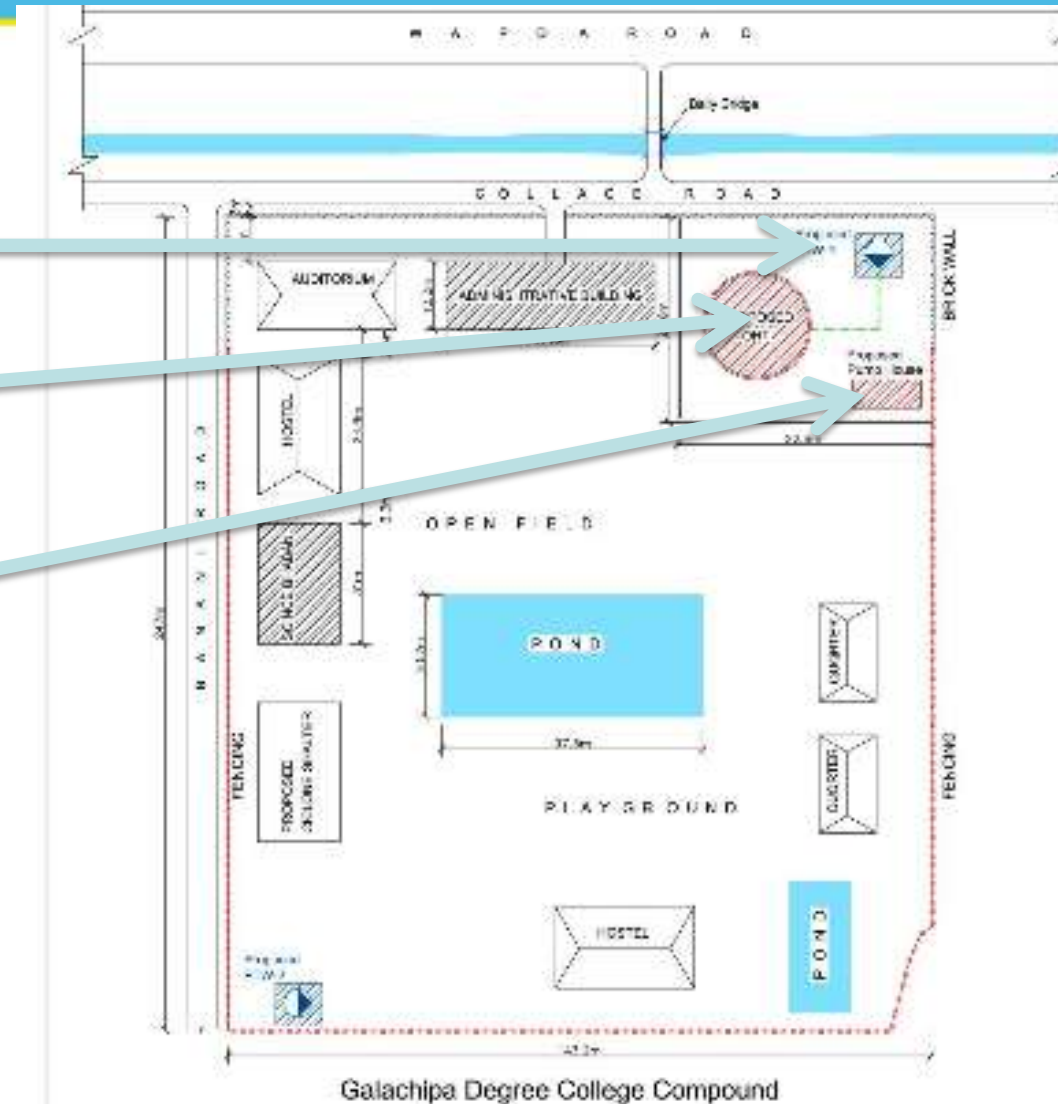
Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank (loan)	52.0	44.4
ADB Strategic Climate Fund (loan)	30.0	25.6
ADB Strategic Climate Fund (grant)	10.4	8.9
Sanitation Financing Partnership Trust Fund	1.6	1.4
Government of Bangladesh	23.1	19.7
Total	117.1	100.0

Climate Resilient Water Supply System: Example at Galachipa College Campus

Production wells: Cement casing raised by additional 1 meter on two production wells.

Storage tanks: Extra reinforcement considering stronger cyclone winds

Pumphouse: (i) Plinth level of pumphouse raised by additional 1 meter from surface; (ii) electrical control panel board raised to minimum height 0.5 m above plinth level; (iii) extra reinforcement in superstructure designed to withstand strong cyclone winds predicted; and (iv) back up generators



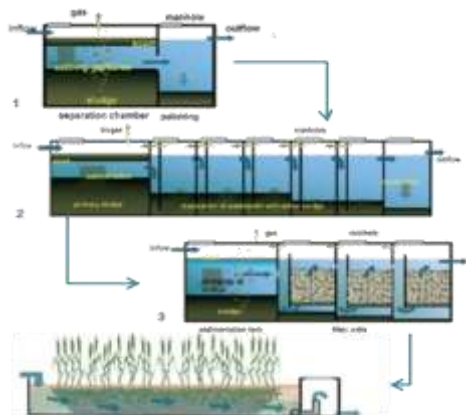
Climate Resilient Sanitation Systems in CTEIP

Proposed Sanitation Schemes:

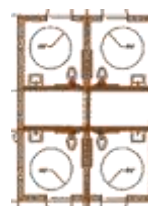
- Combination of on- and off-site approaches – e.g., improved septic tanks, DEWATS, biogas digesters, anaerobic baffle reactors, anaerobic filters and horizontal gravel filters
- Septage collection and treatment systems
- Capacity building for O&M including private sector participation
- Promote reuse of biosolids

Climate Resilient Design:

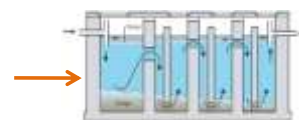
- Proposed sand or earth filling of area surrounding toilet by 1 m
- Plinth level of structures raised by 0.5 m
- Capacity building in septage management. Promoting private sector participation.
- Vacuum trucks to clean septic tank to avoid manual desludging.



DEWATS



Toilet complex



Improved septic tank



Planted drain

Improved communal sanitation systems

Climate Resilient Drainage Systems: Example of Galachipa Town

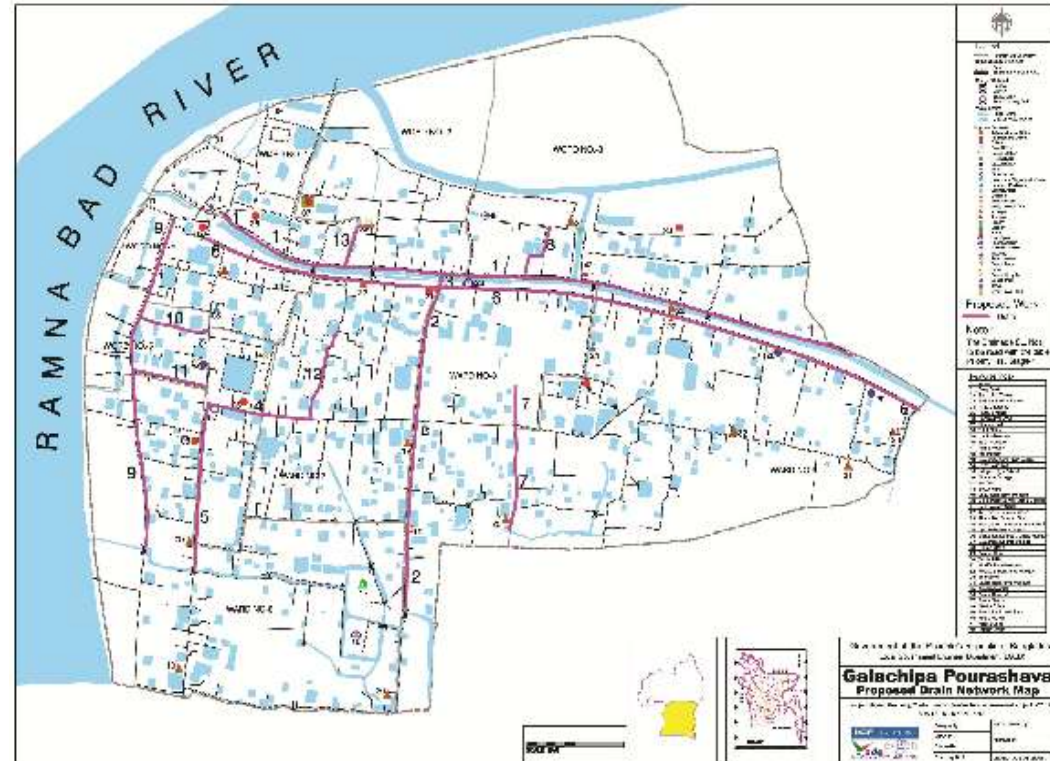
Climate resilient features include:

Physical:

- increase channel capacities
- detain runoff by protecting vulnerable catchments

Non-physical:

- manage runoff and discharges, according to needs and adverse impacts
- improve institutional capacity for O&M and improved resource allocation
- work with relevant stakeholders to manage flood discharges more effectively
- improve collection and disposal of solid waste
- control illegal encroachments along canals



Summary of Physical Adaptation Measures in CTEIP

<p><u>Roads and Bridges</u></p> <ul style="list-style-type: none"> -Raise road levels -Use temperature reinforcement in RCC concrete -Turf/trees along road -Increase rise of deck slab, pile length 	<p><u>Sanitation</u></p> <ul style="list-style-type: none"> -Raise latrine, septic systems above flood levels -Stronger superstructures -Site in areas less prone to future flooding 	<p><u>Cyclone Shelters</u></p> <ul style="list-style-type: none"> -Cyclone shelters open ground floor -Design for 260 km/hr wind speeds - Non saline sourced sand
<p><u>Drainage</u></p> <ul style="list-style-type: none"> -Increased capacity -Capacity to detain runoff -Isolate catchments -Improved O&M, solid waste management -Encroachment control -Raise flood defences -Shorten drainage routes 	<p><u>Water Supply</u></p> <ul style="list-style-type: none"> -Identify non-saline sources -Protect tube wells, pump houses etc. through higher casing levels, site away from flood prone areas -Protect surface water plant, overhead tanks through stronger materials -Power backup generator 	<p><u>Other Municipal Infrastructure</u></p> <ul style="list-style-type: none"> -Site markets, bus terminals in areas less prone to flooding -Use stronger materials

Summary of Non-Physical Adaptation Measures in CTEIP

<p style="text-align: center;">Building Codes</p> <ul style="list-style-type: none"> - Design for higher windspeeds, - better protection against more frequent and severe inundation 	<p style="text-align: center;">Land Use Planning</p> <ul style="list-style-type: none"> - Site vulnerable developments in areas less susceptible to flooding
<p style="text-align: center;">Community Level Adaptation</p> <ul style="list-style-type: none"> - Campaign of community awareness of climate hazards - For poorest, most vulnerable, community-led identification of adaptation measures 	<p style="text-align: center;">Disaster Risk Management</p> <ul style="list-style-type: none"> - Capacity building for Pourashava Disaster Risk Management Committees
<p style="text-align: center;">Strengthened Municipal Financial Management</p> <ul style="list-style-type: none"> - Computerization of financial accounts and billing - Increased tax collection 	<p style="text-align: center;">Improved Municipal Planning, Service Delivery, and O&M</p> <ul style="list-style-type: none"> - Annual O&M Plan - Municipal Water Supply and Sanitation Units functioning effectively

For more information

<http://www.adb.org/projects>

