

Project Climate Risk Assessment and Management

I. Basic Project Information

Project Title: Coastal Towns Environmental Infrastructure Project
Project Budget: \$117.10 million
Location: Eight coastal towns of Bangladesh: Amtali, Galachipa, Mathbaria, Pirojpur, Barguna, Bhola, Daulat Khan, and Kalapara
Sector: Water Supply and other municipal infrastructure
Theme:
Brief Description: The project will strengthen climate resilience and disaster preparedness in eight vulnerable coastal <i>pourashavas</i> (secondary towns) of Bangladesh. The project takes a holistic and integrated approach to urban development and will (i) provide climate-resilient municipal infrastructure, and (ii) strengthen institutional capacity, local governance, and knowledge based public awareness, for improved urban planning and service delivery considering climate change and disaster risks. Key infrastructure investments include (i) drainage, (ii) water supply, (iii) sanitation, (iv) cyclone shelters, and (v) other municipal infrastructure including emergency access roads and bridges, solid waste management, bus terminals, slum improvements, boat landings, and markets.

II. Summary of Climate Risk Screening and Assessment

A. Sensitivity of project component(s) to climate/weather conditions and sea level	
Climate change would lead to higher risks of floods due to more intense monsoon rainfall, sea-level rise, and more intense and frequent tropical cyclones leading to more damages to infrastructure.	
Project component	Sensitivity to climate/weather conditions and sea level
1. Construction of drainage, roads, bridges, and other municipal infrastructure	1. Intensity and frequency of heavy rainfall events
2. Construction of water supply	2. Salinity intrusion into surface and groundwater
B. Climate Risk Screening	
Risk topic	Description of the risk
1. Increased rainfall	1. Risk of more frequent and persistent flooding
2. Sea level rise	2. Salinity intrusion into surface and groundwater
3. More intense cyclones	3. Damage to housing and infrastructure from stronger winds and storm surges
Climate Risk Classification: High	
C. Climate risk assessment	
The country's low-lying coastal zone is highly vulnerable to cyclones, storm surges, sea level rise, and salinity intrusion. A 1.5°C increase in temperature and 4% increase in precipitation (the median projections for Bangladesh from general circulation models) would potentially result in sea levels in the Bay of Bengal rising by 27 centimeters or more by 2050. Warmer temperatures would result in more frequent and intense cyclones and storm surges, damaging roads and bridges and rendering existing drainage, water supply, and sanitation systems ineffective, as well as threatening public health and safety. The central and southwestern regions of Bangladesh, the project area, are particularly vulnerable. The project reflects findings of downscaled climate modeling from the ADB supported technical assistance on Strengthening the Resilience of the Urban Water Supply, Drainage, and Sanitation to Climate Change in Coastal Towns. The eight project towns experienced severe damages in past cyclones. There are risks of severe flooding due to heavy monsoon rainfall from tropical storms and infrastructure deficits in stormwater drainage systems. It is projected that areas flooded with more than 25 cm in depth will increase by 40%-100% in towns in 2050 compared to 2012, and to 14%-24% of the total town area compared to without any project intervention. The landward progression of salinity by 2065 and 2100 over the central coastal zone may result in high salinity levels in surface and groundwater sources posing health threats.	

III. Climate Risk Management Response within the Project

All infrastructure under the project will be screened on the basis of agreed technical selection criteria and

will consider climate projections for year 2040 in detailed designs. A sample of adaptation measures considered in the project designs are provided below. Implementation of non-structural interventions will be supported through consulting services under the loan.

For roads:

- Crest level raised considering increased rainfall and flooding
- Embankments additionally strengthened on roads in flood areas
- Need for larger culverts assessed

For Cyclone Shelters:

- Base level of first floor raised to avoid higher storm surges.
- Structures strengthened to withstand stronger wind forces
- Utilizing sand sourced from non-coastal areas to avoid saline contamination

For drainage and flood control:

- New and existing drains built with enhanced capacities considering 2040 rainfall projections

For water supply investments:

- Deeper tube wells to explore non-saline sources. Location of surface water intakes based on salinity tests and assessments considering sea level rise.
- The upper well casing of production tube wells will be vertically extended for protection from flooding and storm surges.
- Provision for power backup to keep water supply system operational during storms
- Protection measures (embankment with block pitching) around water treatment plants to protect from cyclones and storm surges.

For sanitation investments:

- Septic tanks and superstructures of public toilets, school toilets and community latrines will be constructed above flood level to keep protected from inundation during monsoon flooding.
- The pit of the latrine will be placed above the flood level.

Non-structural measures to reduce climate and disaster risk:

- Review and update urban master plans, local building codes, and engineering design standards of LGED and DPHE to incorporate climate change and disaster resilient measures
- Improve water safety planning and groundwater monitoring through the development of water safety plans and guidelines
- Establish disaster management standing committees in each town, and deliver appropriate technical training for the members of such committees.