PROJECT CLIMATE RISK ASSESSMENT AND MANAGEMENT REPORTING

I. Basic Project Information

Project Title: Additional Financing of Third Urban Governance and Infrastructure Improvement (Sector) Project
Project Budget: $268.1 / ADB financing: $200 million
Location: Preselected municipalities in Bangladesh
Sector: Water and other urban infrastructure and services
Theme: Environmental Sustainability, Governance, Gender Equity, and Capacity Development
Brief Description: The current project supports the strengthening of urban governance and improvement of urban infrastructure and service delivery in *pourashavas* (municipalities) by providing investment support to *pourashavas* based on their governance performance. The additional financing will expand the current project, which is performing well, by supporting (i) additional priority infrastructure and governance improvements in *pourashavas* covered by the current project, and (ii) infrastructure and governance improvements in five more *pourashavas*. The overall project (current project including additional financing) will strengthen urban governance and improve urban infrastructure and service delivery in *pourashavas* and focus on key municipal infrastructure such as roads; drainage; water supply and sanitation, including septage management; and solid waste management. The project will also provide inclusive access to climate-resilient infrastructure along with soft measures, to build resilience to current and future urban shocks and stresses, including climate and disaster events.

II. Summary of Climate Risk Screening and Assessment

A. Sensitivity of Project Component(s) to Climate or Weather Conditions and Sea Level

As the magnitude of tropical storms and cyclones in Bangladesh is predicted to increase due to climate change and concomitant rising temperature, it is expected that *pourashavas* will experience more flooding associated with more powerful storms. Increased rainfall variability, and tidal and river flooding, would exacerbate waterlogging and landslide problems in *pourashavas*, which are already facing infrastructure deficit. Sea-level rise will impact any coastal zone *pourashava*; among the five new *pourashavas* to be included under the additional financing (Cox's Bazar, Faridpur, Gopalganj Kushtia, and Mymensingh) this specifically applies for Cox's Bazar. However, due to topography and hydrology, sea level rise impacts may intrude further inland and not just be limited to the coastal zones. Increased aquifer salinity during the dry season affecting water supply is also expected to increase.

Project component	*Sensitivity to climate and weather conditions and sea level*
1. Urban roads	1. Prolonged heat, increase in temperature, intensity and frequency of heavy rainfall and flooding events
2. Urban drainage	2. Increase in intensity of heavy rainfall events, storm surge, and riverine flooding
3. Urban water supply	3. Increase in temperature and change in aquifer salinity and water table levels
4. Urban sanitation	4. Increase in temperature, sea level rise, storm surge, and flooding
5. Solid waste management	5. Increase in precipitation and higher temperature
6. Other municipal facilities	6. Increase in temperature, heavy rainfall and flooding events, strong winds

B. Climate Risk Screening

Risk topic	*Description of the risk*
1. Changes in rainfall	1. Clogging of drains during extreme rainfall events that may damage the structure; drains and waste facilities may need to cater to more intense rainfall
2. Temperature increase	2. Faster deterioration of pavements due to exposure to prolonged heat; higher temperatures and droughts can cause fire at waste facilities
3. Cyclone and storm surge floods	3. Increased soil erosion and washout of road-supporting culverts during flash floods; rising water levels due to storm surge, sea level rise, and flooding can lead to failure of sanitation systems, impacting community health
4. Flooding	4. Flooding of roadways; damage to waste disposal foundations; inundation, bank cutting, and sediment deposition are likely to impact infrastructure
5. Rainfall-triggered landslides in hilly areas	5. Threat of rainfall-triggered landslides in higher elevations and landslides at lower elevations especially after extreme rain events and earthquakes
6. Salinity impacts on concrete structures	
7. Earthquakes as a nonclimate risk	

	6. Increased water salinity is likely to impact concrete curing times and interact with metallic components, resulting in a shortened design life 7. Increased maintenance and construction costs

Climate risk classification: Moderate. Although Bangladesh is a high-risk country to the impacts of climate change, the project scope and subprojects will not be implemented in sensitive, high-risk locations.

C. Climate Risk Assessment

Climate risks in *pourashavas* vary from low to high for a variety of hazards. The project needs to consider earthquake threats at the different areas and be guided by the government (international) standards for this risk. Climate model projections do not agree that seasonal precipitation will increase in project locations, which could indicate a relatively high degree of uncertainty. However, climate change is projected to influence frequency and intensity of rainfall and flood events. Engineering designs need to take into consideration the impact of climate change on the risks from flooding, waterlogging, and where relevant, increased salinity and wind loads. Especially poor and vulnerable people in the *pourashavas* struggle to cope with heavy rainfall, let alone increasing extreme weather events, emphasizing the need for proactive preparedness plans and resilient infrastructure investments.

III. Climate Risk Management Response within the Project

1. Climate risk screening was done for the *pourashavas* covered by the current project and for five more *pourashavas* to be included under additional financing. With support from ADB's technical assistance, Promoting Urban Climate Change Resilience in Selected Asian Cities (TA 8913) financed by the Urban Climate Change Resilience Trust Fund under ADB's Urban Financing Partnership Facility, an integrated, consultative process mainstreaming climate change adaptation and mitigation in the five new *pourashavas* was developed. These include (i) climate risk and vulnerability assessment for wards, (ii) update of master plans incorporating climate and disaster risks and priority interventions, (iii) capacity building for climate and disaster-resilient urban planning, and (iv) feasibility studies for priority subprojects including climate-responsive engineering designs.
2. Key subproject design criteria have been prepared to take into account climate impacts and are included in the project administration manual. Considerations include (i) use of cement or concrete for roads vulnerable to frequent waterlogging, and the need for increased number of drainage channels along roads; (ii) additional free-board allowance and additional changes to the design parameters, such as channel depth, width and slope, increased safety easement, etc. for key facilities such as production tube wells, pump houses, and water treatment plants; (iii) at least 15% extra reinforcement of overhead tanks to stand more intense cyclones and heavy winds; (iv) review of the interaction of reinforcing elements (rebar, steel, iron, etc.) for standing water impacts on concrete curing, design life, and depth of reinforcement from concrete edge; and (v) 10% additional capacity in drainage and water storage systems to accommodate additional run-off due to increased rainfall intensity.
3. *Pourashavas* will strengthen development control activities with support from loan consultants. Encroachment into public lands including rivers and canals will be prevented to keep outflow capacity and reduce disaster risks.
4. Capacity building among *pourashava* engineers, planners, and project staff on undertaking safeguards due diligence to also incorporate climate change resilience procedures.
5. Inclusive and iterative consultations at *pourashava* level, including with vulnerable communities and those residing in slum areas.
6. Regular operation and maintenance activities and equipment inspections at the *pourashava* level to help mitigate damage and ensure continuous operations and fast recovery after disaster events.
7. On solid waste management, secondary waste containers should be used and placed on a raised concrete floor to avoid flood water and reduce the chance of leachate generation. Landfill sites should have high-density polyethylene lining and clay layer to avoid percolation of leachate water into ground water. To save landfill area, at least 20%–30% of organic waste should be recycled. This will also reduce greenhouse gas emissions.
8. On fecal sludge collection and treatment, vacuum trucks will collect fecal sludge from pits and septic tanks. Regular emptying of pits and septic tanks reduce chances of pit overflow. Fecal sludge treatment in drying beds and percolates should be treated with trickling filters. Treatment of fecal sludge will reduce improper disposal in low-lying areas and water bodies, and prevent surface and ground water pollution.