CLIMATE CHANGE RISK SCREENING
Climate Change: Project Adaptation Action (PAA) Report

Part 1: Climate Change Adaptation

BASIC PROJECT INFORMATION	
Project Title*:* IND: Karnataka Integrated Urban Water Management Investment Program	**Sector:** Water Supply and other Municipal Infrastructure and Services
Location: Karnataka is a state in South West India. It is bordered by the Arabian Sea and the Laccadive Sea to the west, Goa to the north west, Maharashtra to the north, Andhra Pradesh to the east, Tamil Nadu to the south east, and Kerala to the south west. The state covers an area of 191,976 square kilometres (74,122 sq mi), or 5.83 per cent of the total geographical area of India. It is the eighth largest Indian state by area with 61,130,704 inhabitants at the 2011 census.	**Estimated ADB Financing:** US$150 million
Brief Description:	**Implementation Period:** March 2014 – March 2024

The Karnataka Integrated Urban Water Management Investment Program (KIUWMIP, the Program) aims to improve water resource management in urban areas in a holistic and sustainable manner consistent with the principles of Integrated Water Resources Management (IWRM). Investment support will be provided to modernize and expand urban water supply and sanitation (UWSS), and strengthen institutions to improve water use efficiency, productivity, and sustainability. Innovative technologies and instruments, such as public-private partnerships (PPP) or reform-oriented incentive funds, will be pursued. The Program will support Asian Development Bank's (ADB's) greening and inclusiveness agendas, as it targets assistance to fragile water-scarce environments, often located in Karnataka's more economically lagging regions. The Program will also support ADB's climate change strategic priorities by promoting climate-resilient development and capacity development for conducive adaptation.

Karnataka's Integrated Urban Water Management road map will assist establishing a process of coordinated planning, development and management of urban water resources, in a way that maximizes economic and social welfare without compromising environmental sustainability. The associated policy and institutional framework will provide an enabling environment to improve urban water management, enhance technical and environmental sustainability, and promote institutional and financial sustainability. The Government of India and the State have requested ADB to finance a fraction of the State's investment program through an MFF. The MFF is well suited for this investment as it is the most effective modality to: (i) maximize and measure project results in localized geographical areas; (ii) provide efficiencies associated with economies of scale, as additional municipalities join regional utilities; and (iii) blend capacity development assistance with policy implementation and infrastructure provision, and phase it to maximize ULB commitment. The modality is appropriate given (i) the State's sound record in the sector and willingness to undertake reforms, and (ii) Karnataka Urban Infrastructure Development and Finance Corporation's (KUIDFC's) proven capacity.

The Road Map's objectives are fully consistent with ADB's draft country partnership strategy for India (2013-2017), which proposes to (i) pilot new approaches for sustainable urban development, in small and mid-sized cities with high potential for growth, (ii) encourage technical advancement; (iii) strengthen governance and reforms for service delivery; and (iv) develop institutional capacity. The Road Map and MFF design incorporate lessons learned from ADB's experience in India, especially in Karnataka, including the need to: (i) incorporate low-cost sanitation facilities for poor households, (ii) provide house service connections for urban water and sewerage as part of the project scope, (iii) include targeted awareness campaigns aimed at changing the behavior of urban residents, and (iv) during the implementation of institutional reforms, use a standardized set of systems and processes at the state level to deliver results.

KIUWMIP has been framed in line with priorities outlined in (i) India's 12th Five Year Program (12 FYP), (ii) policy directions outlined by the Ministry of Water Resources in the draft National Water Policy, and (iii) service delivery reforms promoted by the Ministry of Urban Development (including service level benchmarks and the National Urban Sanitation Policy, 2008). The program has been designed in support of

Karnataka's "Vision 2020" (which envisages eliminating poverty in all areas and the achievement of the Millennium Development Goals by 2015), the State's Water Policy (2002), and Karnataka's Urban Drinking Water and Sanitation Policy (2002). KIUWMIP complements the activities proposed in parallel by the proposed Karnataka Integrated and Sustainable Water Resources Management Investment Program for irrigation modernization, IWRM and river basin management.

Climate Change Classification: Adaptation – medium; Mitigation - low

SUMMARY of CLIMATE RISK SCREENING

(Screening will be done using GIS and Remote Sensing techniques built through three sets of databases: Geological, Climate and Knowledge base. Other climate change assessment reports or databases can be used provided they are from reputable sources and appropriate scope.)

A. Projected changes under A2 scenario

Temperature (^oC)	Precipitation (mm)	Sea Level Rise (masl):	Others:
Annual mean temperature at 2050 is projected to rise between 1.8 (along the coastal regions) to 2.4 degrees Celsius (in northern part of the state).	Annual precipitation is projected to increase between 40 (the southern part of the state) and 120 mm (the northern part of the state), and averaged at about 80mm for the entire state.	Not Applicable	

B. Climate Risks

1. Landslide triggered by Precipitation	Y	**Description of the risk:** Annual total precipitation over the regions prone to landslide by 2050 is projected to increase by about 80mm under the A2 scenario. The increase is projected to occur mostly during the monsoon season (June - October) particularly during the months of August and September. The risks are likely to be escalated. Flood risks are likewise projected to escalate due to increased precipitation in August and September. On the other hand, failure of the monsoon is occurring more frequently so are the risks of drought. Rising temperatures results in greater water loss through evaporation and evapotranspiration as well as a negative effect on water quality. Water use is expected to increase dramatically due to population expansion (in fact the state's annual water consumption is forecasted to rise by up to 40% by 2025). The availability of water is highly likely to be negatively impacted by climate change. The issue becomes more pressing as the result of over abstraction of surface water, deterioration of river water quality, urbanization, industrialization, and so on. The integrated urban water management investment is in fact in urgent need for the state of Karnataka to be poised to adapting to the changing climate, which is expected to impose serious threats to its water resources.
2. Fire	Y	
3. Flood	Y	
4. Drought	Y	

Recommendations

Activities:	**Requirements for TOR:**
1. The results of the screening exercise suggest that the activities outlined in the concept paper constitute important and necessary actions of adaptation for sustainable urban development within the state of Karnataka. 2. Improving water resource management in urban areas of Karnataka State is absolutely necessary to adapt the state to the changing climate.	None identified.

Risk Classification: Low

DUE DILIGENCE *(Enumerate the type of analytical or fact finding activities conducted during project preparation)*
Activities: 1. A climate risk screening was conducted for the project, looking into both the vulnerability of project components and sites, and the possibility of occurrence of identified climate related hazards. The screening report was considered during the final stages of project design. 2. The Program has been designed to incorporate IWRM in accordance with the principles of environmental sustainability – which now includes adaptation (or resilience) to a changing climate. Water resources will be managed taking into account the projected shift in the water regime caused by increasing temperature and changing precipitation patterns. 3. Related literature from other climate studies and researches were also used to substantiate the screening report.
PROJECT DESIGN CHANGE OR ADAPTATION RESPONSE *(Describe key action items and budgetary allocations, and other response measures relevant to the project)*
IWRM can be viewed as a form of adaptation response since it ensures water sustainability given the environmental, social and economic conditions influencing the watershed and the services it provides. Planning for IWRM considers several critical factors such as streamflow projections, the watershed conditions, and the demand from water users. The project considers these factors and incorporated into the project design.