ADB

Technical Assistance Report

Project Number: 49106-001
Cluster—Capacity Development Technical Assistance (C-CDTA)
October 2015

India: Strengthening Climate Change Resilience in Urban India

(Financed by the Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility)

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 30 September 2015)

Currency unit	–	Indian rupee/s (Re/Rs)
Re1.00	=	$0.015
$1.00	=	Rs65.934

ABBREVIATIONS

ADB	–	Asian Development Bank
DEA	–	Department of Economic Affairs
GDP	–	gross domestic product
GIS	–	geographic information system
MOUD	–	Ministry of Urban Development
SARD	–	South Asia Department
SAUW	–	Urban Development and Water Division
TA	–	technical assistance
UCCRTF	–	Urban Climate Change Resilience Trust Fund

NOTE

In this report, "$" refers to US dollars.

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CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data **Project Number:** 49106-001

Project Name	Strengthening Climate Change Resilience in Urban India	**Department /Division**	SARD/SAUW
Country	India	**Executing Agency**	Department of Economic Affairs
Borrower	Not applicable		

	2. Sector	**Subsector(s)**	**Financing ($ million)**
✓	Water and other urban infrastructure and services	Urban flood protection	1.30
		Urban policy, institutional and capacity development	1.30
		Urban sanitation	0.90
		Urban solid waste management	0.90
		Urban water supply	1.30
	Transport	Urban roads and traffic management	1.30
		Total	**7.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Adaptation ($ million)	5.00
		Mitigation ($ million)	2.00
		CO_2 reduction (tons per annum)	2,000
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	Climate Change impact on the Project	High

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Institutional development Organizational development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas		
Partnerships (PAR)	Bilateral institutions (not client government) Foundations Official cofinancing		

5. Poverty Targeting		**Location Impact**
Project directly targets poverty	No	Not Applicable

6. TA Category: A

7. Safeguard Categorization Not Applicable

8. Financing

Modality and Sources	**Amount ($ million)**
ADB	**0.00**
None	0.00
Cofinancing	**7.00**
Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility	7.00
Counterpart	**1.75**
Government	1.75
Total	**8.75**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	No

I. INTRODUCTION

1. The proposed cluster capacity development technical assistance (TA), supported on a grant basis under the Urban Climate Change Resilience Trust Fund (UCCRTF), aims to improve institutional capacities of the Government of India to identify, plan, invest in, and respond to climate change and disaster-related risks in vulnerable cities and towns across India. The key objectives of the TA are to (i) mainstream urban climate change resilience in policies, strategies, and plans at the national, state, and city levels; (ii) strengthen structural and nonstructural investments in selected cities; and (iii) build strong government institutions across the central, state, and local levels. Cities highly vulnerable to climate change will be targeted, particularly those in coastal areas and river basins.

2. The TA will provide direction to the government in developing well-planned cities which are livable, sustainable, reduce greenhouse gas emissions, and resilient to climate-change-related risks. The TA builds from the country partnership strategy, 2013–2017 for India of the Asian Development Bank (ADB), which supports (i) energy efficiency (e.g., smart grids, efficient pumps); (ii) sustainable transport systems; and (iii) efficient and sustainable water management, including advice on policy and institutional reforms.[1] ADB's urban program focuses on expanding the coverage, quality, and continuity of inclusive basic services while embracing the principles of resilience and efficiency. The government confirmed the impact, outcome, outputs, implementation arrangements, cost, financing arrangements, and terms of reference through confirmation of the aide-mémoire of the TA fact-finding mission.[2]

3. The TA promotes convergence with various government flagship national missions including smart cities, new and renewable energy, “make in India”, clean India, housing for all, and urban transport initiatives. Considering the multifaceted demands for building resilience, the TA will support various sectors, i.e., urban, water, energy, transport, and natural resources management. The design and monitoring framework is in Appendix 1.

II. ISSUES

4. Projected temperature changes in India are 0.6°C–2.4°C in 2030, 1.1°C–3.5°C in 2050, and 1.9°C–6.2°C in 2080, with warming pronounced in western and central parts of the country.[3] Such increases in temperature would result in precipitation increase of more than 20%, sea-level rise, and more extreme weather events. Recent examples of climate-related disasters include flashflooding in Uttarakhand in 2012, and Cyclone Phailin in Odisha and Andhra Pradesh in October 2013. Within Asia, 24% of deaths are due to disasters that occurred in India. This high percentage is a result of the country’s size, population, and vulnerability, where the poor and women are disproportionately affected. Cities in coastal areas and along rivers are especially vulnerable to flooding, which results in significant losses and damage to (i) property, infrastructure, and services; and (ii) energy, transport, and food systems. This threatens the safety, livability, and overall economic growth of urban areas.

5. A 2014 study conducted by ADB predicted that climate change impacts would result in 1.8% loss of India’s annual gross domestic product (GDP) by 2050 (footnote 3). Considering the major contribution of cities to GDP (more than 60% of India’s GDP is from cities, and this is expected to increase to 75% by 2020), there is an urgent need to strengthen urban climate

[1] ADB. 2013. *Country Partnership Strategy: India, 2013–2017.* Manila.
[2] The TA first appeared in the business opportunities section of ADB’s website on 19 December 2014.
[3] ADB. 2014. *Assessing the Costs of Climate Change and Adaptation in South Asia*. Manila (June).

change resilience across the country. A resilient city would have the institutional and physical capacity to withstand the impacts of climate change and disasters, while mitigation efforts would help reduce climate impacts.[4]

6. Cities in India are not ready to cope with the impacts of climate change. Large infrastructure deficits in drainage, flood control, water supply, solid-waste management, energy, and public transport systems exacerbate sensitivity. High urbanization creates additional pressures on existing infrastructure designed for smaller populations, forcing residents into marginal and often vulnerable parts of cities. Infrastructure planning needs to consider climate change to ensure investments deliver intended benefits. There is also an urgent need to strengthen urban governance and management through institutional reforms. Local governments lack capacity to plan and control land use and development; design and implement early warning systems; promote community awareness and participation, especially for the poor and women; and ensure financial sustainability of public assets.

7. Given the wide range of institutional capacities across urban India in strategic planning and project preparation, coupled with limited knowledge and understanding of climate change, a comprehensive and focused intervention through a cluster TA approach is appropriate. A cluster TA is justified over a stand-alone TA for two reasons: (i) strengthening urban resilience requires a series of interventions over time with comprehensive support from multiple sectors—urban, energy, transport, and water resources management; and (ii) customized TA support is required in parallel at different administrative levels—central, state, and city—to build required institutional capacity. Although mandates to manage cities are largely decentralized to city governments, significant policy, spatial planning, and capital investment decisions are retained at the central and state levels. Therefore, the TA needs to (i) support the Ministry of Urban Development and other central ministries with influence on urban areas; and (ii) in parallel, support selected states and cities. Some institutions require limited support in the form of incremental consulting services for project preparation or capacity support in specialized areas of resilience planning; some require policy and advisory TA; some need conventional project preparatory TA, especially for climate-change-resilient infrastructure; while many require extensive all-round support. The cluster TA approach offers flexibility to meet diverse and fast-emerging requirements, and will be relevant, responsive, and results oriented.

8. Approval of the ADB Board of Directors is requested to include project preparatory TA in the cluster capacity development TA on an exceptional basis to (i) address the considerable capacity gap in preparing urban climate-change-resilient investment projects, and (ii) enhance the efficiency and effectiveness of the India program in addressing a critical cross-sector theme.[5]

III. THE PROPOSED CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE

A. Impact and Outcome

9. The overall impact will be urban climate change resilience in selected states in India mainstreamed. The expected outcome will be capacity of government to successfully implement urban climate-change-resilient projects enhanced. The outputs include: (i) climate change resilience in urban policies and plans mainstreamed; (ii) climate change resilience of

[4] Carbon dioxide reduction occurs through the use of renewable energy sources (solar power street lights, water pumps); optimization of existing infrastructure and networks for improved energy efficiency; or use of biogas from sludge, landfill gas recovery, avoidance of methane gas from organic composting, and waste-to-energy facilities.

[5] Safeguard policy requirements applicable to project preparatory TA will be maintained.

infrastructure and project development supported; and (iii) institutional capacity, community awareness, and knowledge for sustaining climate-change-resilient cities strengthened. TA outputs will be achieved primarily through the following activities: (i) comprehensively assessing and selecting policy instruments which promote urban climate change resilience, (ii) conducting institutional and sector analyses, (iii) conducting risk and vulnerability assessments in selected cities, (iv) preparing city-level climate-change-resilience plans, (v) supporting feasibility studies for identified projects, and (vi) delivering climate change awareness programs.

B. Methodology and Key Activities

10. The UCCRTF subproject selection criteria (Supplementary Appendix 1) will guide cluster TA subproject designs and city selection to be finalized during the TA implementation. The key criteria include geographic vulnerability of urban area, government buy in, and local capacity and ownership. The TA will (i) reduce the number of stand-alone TA projects, (ii) support project readiness of projects through advanced preparation, and (iii) integrate best practices into structural and nonstructural investment components. The government's capacity to successfully implement urban climate-change-resilient projects will be significantly strengthened through TA outputs, including policy advisories, improved urban and investment planning, and awareness building and knowledge exchange.

11. Key activities to be supported under the TA include (i) assessing and advising on strategies, policies, and regulations at the central and state levels; (ii) conducting hazard risk and vulnerability analyses; (iii) preparing city-level climate change resilience plans and early warning systems; (iv) developing good models and case studies and disseminating best practices; (v) undertaking community awareness raising and skill training; (vi) building capacity of government officials; (vii) project scoping and investment planning; (viii) conducting feasibility studies with preliminary engineering designs and cost estimates; [6] and (ix) supporting implementation of related activities. The responsibility for identifying and implementing these activities will rest with respective project officers of the TA subproject. An indicative list of TA subprojects discussed with the government and expected outputs are in Supplementary Appendix 2.

C. Cost and Financing

12. The TA is estimated to cost $8.75 million, of which $7 million will be financed on a grant basis by the UCCRTF[7] under the Urban Financing Partnership Facility and administered by ADB. The government will provide counterpart support in the form of counterpart staff, office accommodation, studies and surveys already conducted, and other in-kind contributions including taxes and duties, if any. The value of the government contribution is estimated to account for 20% of the total TA cost.

13. The TA will finance the cost of expert services and related operational activities including training and development, but will not include pilot testing. The scope of assistance complies with the principles outlined in para. 3 of the Staff Instruction on Due Diligence and Reporting Requirements for Technical Assistance.[8]

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[6] Feasibility studies for investment projects will include ADB safeguards due diligence.

[7] Financing partners: the Rockefeller Foundation and the governments of the United Kingdom and the United States.

[8] ADB. 2013. Due Diligence and Reporting Requirements for Technical Assistance. *Compendium of Staff Instructions*. Manila.

D. Implementation Arrangements

14. The Department of Economic Affairs (DEA) of the Ministry of Finance is the executing agency of the TA. A TA steering committee, chaired by DEA, will be constituted and comprise the country director of ADB's India Resident Mission, sector directors of ADB's South Asia Department (SARD) or sector specialists, the project officer of the TA, and representatives of the relevant ministries and states, as required. The steering committee will screen and endorse subproject proposals for further ADB processing and review overall status of TA implementation. TA subprojects will be approved by the SARD director general as and when they are ready to be implemented. Ministries and states selected for TA support will be the implementing agencies for the respective TA subprojects. Implementing agencies will support TA subproject designs and day-to-day implementation, including government coordination. The TA and its subprojects are expected to be implemented from November 2015 to September 2018.

15. SARD's Urban Development and Water Division (SAUW) will be the principal administrator of the TA responsible for overall coordination. Respective project officers will be responsible for managing and delivering relevant outputs under TA subprojects, including (i) recruitment and management of consultants, (ii) implementation oversight, (iii) accountability for the outputs, and (iv) reporting and communicating with stakeholders. Disbursements under the TA will be done in accordance with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

16. Each TA subproject will require a team of international and national consultants to be engaged separately. Indicative cost estimates for consulting services were prepared in consultation with project officers of the TA subprojects. However, these are indicative and estimates will be finalized in consultation with the government during follow-up missions. Similarly, the requisite fields of expertise (detailed in Appendix 3) will also be finalized during follow-up missions and reflected in the individual TA subproject proposals.

17. Firms (or consortia of firms) and/or individual consultants will be recruited based on the requirements of each TA subproject. Consulting firms will be engaged following the quality- and cost-based selection method, with a quality–cost ratio of 90:10 using full or simplified technical proposal procedures, consultant's qualification selection, or fixed budget selection, as appropriate. Individual consultants will be selected using the individual consultant's selection method, and will be engaged to provide specialized technical and administrative inputs to fulfill ADB due diligence requirements and enhance project readiness. Recruitment of all consultants under the TA will be carried out in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Lump-sum or output-based contracts will be considered for consulting services under the TA consistent with ADB's Midterm Review of Strategy 2020 Action Plan (actions 2.9.2 and 2.10.2) to reduce administrative burden and improve economy, efficiency, and value for money.[9]

E. Governance

18. The TA implementation team will consist of SARD sector and resident mission staff and TA consultants with sector and urban climate change resilience expertise. The TA implementation team will regularly communicate TA progress to ADB Management, the DEA, and UCCRTF financing partners. The TA will be monitored through regular internal ADB review meetings and timely delivery of quality outputs. Overall TA results will be disseminated through

[9] ADB. 2014. *Midterm Review of Strategy 2020 Action Plan.* Manila (as updated periodically).

ADB's website. Annual audit reports will be prepared in accordance with the UCCRTF implementation guidelines.

19. The DEA is the nodal agency for ADB on all lending and nonlending projects, including those being implemented by central ministries and state governments and those of central public sector undertakings and financial institutions. All government agencies wishing to avail themselves of external assistance are required to prepare proposals and forward them to the DEA for approval. The DEA ensures all foreign assistance supports the government's priorities, and receives budgetary and administrative clearances at appropriate stages.

20. ADB provided two cluster TA projects to the Government of India with the DEA (in 2006 and 2009) as an executing agency. The first cluster TA was financed by the Department for International Development of the United Kingdom for $15 million and supported 24 cluster TA subprojects.[10] The ADB Board of Directors approved a request for a waiver of the inclusion of project preparatory TA under that cluster TA. The TA completion report rated the cluster TA *successful*, the performance of the executing agency and implementing agencies was rated *satisfactory,* and achieving outcomes and impacts was rated *highly effective*. The DEA expressed tremendous appreciation for this modality. The subsequent Department for International Development–ADB Partnership for India (2009–2013) covered the ongoing cluster TA for Advanced Project Preparedness for Poverty Reduction with an overall allocation of $22 million in two phases.[11] It comprised a total of 30 TA subprojects and was extended up to December 2015. The cluster TA facilitates enhanced project preparedness of ADB-supported projects, especially in lagging states and pro-poor sectors. It reduced the need for stand-alone TA and increased the government's ownership of follow-up projects. The TA projects improved the quality and delivery of ADB's assistance program for India. Cluster TA subprojects were selected to ensure representation of the poorest states or pro-poor activity sectors. Considering the positive experience of past cluster TA projects with the DEA as an executing agency, the department is well positioned to serve this role for the proposed TA.

IV. THE PRESIDENT'S RECOMMENDATION

21. The President recommends that the Board approve (i) ADB administering the cluster technical assistance not exceeding the equivalent of $7,000,000 to the Government of India to be financed on a grant basis by the Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility for Strengthening Climate Change Resilience in Urban India; and (ii) in respect of the cluster technical assistance, the waiver of the policy concerning exclusion of project preparatory technical assistance, as proposed in paragraph 8 of this report.

[10] ADB. 2006. *Technical Assistance Cluster to India for Project Processing and Capacity Development*. Manila (approved in 2006 and completed in 2008).

[11] ADB. 2011. *Technical Assistance Cluster to India for Advanced Project Preparedness for Poverty Reduction*. Manila (TA 0003-IND).

DESIGN AND MONITORING FRAMEWORK

Impact the technical assistance is aligned with: Urban climate change resilience in selected states in India mainstreamed (defined by project)

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Capacity of government to successfully implement urban climate-change-resilient projects enhanced	By end 2018: a. Proportion of new ADB projects in India with urban climate-change-resilient designs increased by 5% (2015 baseline: 0) b. ADB projects in at least five cities include urban climate-change-resilient designs based on urban climate-change-resilience plans (2015 baseline: 0)	a. Consultant reports b. Reports and recommendations of the President	**Risk** Insufficient government funds to finance added cost for adaptation
Outputs 1. Climate change resilience in urban policies and plans mainstreamed	By end 2018: 1a. Guidance and advisory notes based on best practices in urban climate change resilience with gender considerations distributed by the Ministry of Urban Development and state departments of urban development (2015 baseline: 0) 1b. New city climate change-resilient plans with gender considerations developed and approved in at least 5 cities (2015 baseline: 0)	For all indicators: Policy notes issued; approved city master plans or strategies	**Risk** Government not prioritizing climate change adaptation as a strategic priority at policy level
2. Climate change resilience of infrastructure and project development supported	By end 2018: 2a. Project preparation activities for scaling up urban climate-change-resilient infrastructure and services considering gender issues developed in at least five cities (2015 baseline: 0)[a] 2b. Pipeline investment program (2017–2020) developed with climate-change-resilient projects (2015 baseline: 0)	For all indicators: Approved studies, implemented subprojects, or scale-up plans; country programming mission aide	
3. Institutional capacity, community awareness, and knowledge for sustaining climate-change-resilient cities strengthened	By end 2018: 3a. Citizen or city stakeholder awareness and education campaigns, workshops, and trainings developed and implemented in at least five cities 3b. One knowledge product on	For all indicators: TA or city reports, brochures and TA documents; knowledge product	

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
	developing climate-change-resilient cities in India developed and disseminated		

Key Activities with Milestones

1. Climate change resilience in urban policies and plans mainstreamed

1.1 Comprehensively assess and select policy instruments which promote urban climate change resilience (Q2 2016).

1.2 Conduct institutional and sector analyses. Conduct risk and vulnerability assessments (Q1 2016–Q4 2016).

1.3 Prepare city-level climate-change-resilience plans (Q1 2016–Q4 2016).

1.4 Prepare guidelines and policy notes to enhance resilience and adaptation covering all urban infrastructure areas (Q3 2015).

1.5 Develop a program performance monitoring system and build a climate-change-resilience platform for communications (Q3 2015).

1.6 Evaluate program (Q2 2018).

2. Climate change resilience of infrastructure and project development supported

2.1 Provide support for feasibility studies, as required, for identified projects (2016–2018).

3. Institutional capacity, community awareness, and knowledge for sustaining climate-change-resilient cities strengthened

3.1 Design and deliver climate change and city resilience awareness programs for community, city managers, and political spheres (Q3 2015–Q4 2017).

3.2 Building on the lessons derived in implementation of outputs 1 and 2, prepare a knowledge and dissemination program, including publications (2017).

Project Management Activities

Mobilize consultants for project development activities (2015–2016).

Recruit TA subproject consultants (2016-2017).

Inputs

Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility: $7 million (grant)

Note: The government will provide counterpart support in the form of counterpart staff, office accommodation, studies and surveys already conducted, and other in-kind contributions.

Assumptions for Partner Financing

Not applicable

ADB = Asian Development Bank, Q = quarter, TA = technical assistance.

[a] Structural and nonstructural investments designed under the cluster TA will require (i) clear links with hazard risk and vulnerability analyses, and (ii) clear indicators demonstrating climate change resilience. Indicators should be measurable to the extent possible.

Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN

($ million)

Item	Amount
Urban Climate Change Resilience Trust Fund[a] under the Urban Financing Partnership Facility	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	1.1
ii. National consultants	4.0
b. International and local travel	0.3
c. Reports and communications	0.1
2. Training, seminars, and conferences	
a. Facilitators	0.1
b. Training program	0.2
3. Surveys	0.2
4. Miscellaneous administration and support costs	0.1
5. Contingencies	0.9
Total	**7.0**

Note: The technical assistance is estimated to cost $8.75 million, of which contributions from the Urban Climate Change Resilience Trust Fund under the Urban Financing Partnership Facility are presented in the table above. The government will provide counterpart support in the form of counterpart staff, office accommodation, studies and surveys already conducted, and other in-kind contributions. The value of government contribution is estimated to account for 20% of the total technical assistance cost.

[a] Financing partners: the Rockefeller Foundation and the governments of the United Kingdom and the United States. Administered by the Asian Development Bank.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

A. Indicative Consulting Services

1. Firms (or a consortium of firms) and individual consultants will be recruited based on the requirements of each technical assistance (TA) subproject under the cluster capacity development TA. Consulting firms will be engaged following the quality- and cost-based selection method, with a quality–cost ratio of 90:10 (because of the high complexity of the assignment and the impact of the expected outputs), using full or simplified technical proposal procedures, consultant's qualification selection, or fixed budget selection, as appropriate. Individual consultants will be selected using the individual consultant's selection method, and will be engaged to provide specialized technical and administrative inputs to fulfill Asian Development Bank (ADB) due diligence requirements and enhance project readiness. Recruitment of all consultants under the TA will be carried out in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Annual audit reports will be prepared in accordance with the Urban Climate Change Resilience Trust Fund implementation guidelines. Lump-sum or output-based contracts will be considered for consulting services under the TA consistent with ADB's Midterm Review of Strategy 2020 Action Plan (actions 2.9.2 and 2.10.2) to reduce administrative burden and improve economy, efficiency, and value for money.[1] However, these are estimates which will be finalized during the preparation of individual TA subproject proposals. The table shows the experts required and indicative person-months, to be finalized and reflected in the individual TA subproject papers.

Summary of Indicative Expert Requirements

Position	Person-Months Required
A. International	
1. Urban climate change resilience specialist (team leader)	18
2. Climate change policy specialist	5
3. Urban planner (green infrastructure)	5
4. Transport planner (transit)	5
5. Energy efficiency specialist (smart grids)	5
6. Disaster management specialist (early warning systems)	5
B. National	
1. Urban climate change resilience specialist (deputy team leader)	36
2. Urban planners (2)	28
3. Solid-waste management specialist	16
4. Flood and storm water specialist	28
5. Integrated urban water resource management specialist	28
6. Wastewater specialist	28
7. Energy efficiency engineer	10
8. Monitoring and evaluation specialist	16
9. Urban governance expert	8
10. Project economists (2)	28
11. Disaster management specialist	12
12. Financial specialists (2)	28
13. Environmental safeguard experts (2)	28
14. Social safeguard experts (2)	28
15. Social and gender expert	28
16. Procurement experts (2)	22
17. Public–private partnership expert	10
18. Education and communications specialist	24

[1] ADB. 2014. *Midterm Review of Strategy 2020 Action Plan.* Manila (as updated periodically).

Position	Person-Months Required
19. Community mobilization specialists (2)	24
20. Meteorologist modeler	10
21.Transport expert	20
22. Institutional specialist (individual recruit)	24
23. Other experts as may be identified (individual recruit)	

Source: Asian Development Bank.

B. Indicative Consultancy Terms of Reference and Outputs

2. The consultancy will be multipronged, with various components being implemented in parallel as follows:

1. Output 1: Climate Change Resilience in Urban Policies and Plans Mainstreamed

a. Institutional and Policy Support

(i) Assist the Ministry of Urban Development (MOUD) and/or states or related agencies to set up advisory groups related to urban resilience. Support MOUD in building partnerships to draw knowledge from academic institutions and think tanks, maximize dissemination, and ensure scientific consensus (e.g., Asian Cities Climate Change Resilience Network).

(ii) Devise a draft implementation strategy and action plan to enable delivery of climate-change-resilient city goals by MOUD in selected states and cities. On this basis, finalize the plan and prepare a work program outlining required resources at various implementation levels. Support MOUD in presenting and securing approval for the work program and its rollout.

(iii) Building on MOUD strategic documents and the new flagship missions of the government to assess whether revisions to original documentation are required, reflect climate change resilience, and ensure consistency and maximize synergies among programs.

(iv) Prepare advisories and implementing guidelines to enhance and mainstream resilience and adaptation covering all urban infrastructure areas, including areas for mainstreaming climate proofing, under MOUD guidance at the state level.

(v) Comprehensively assess and select policy instruments which collectively may promote urban climate change resilience. Partial variations may apply across the country given its vast breadth. Conduct consultations with other stakeholders, including other National Action Plan for Climate Change agencies, National Sustainable Habitat Mission focal agencies, states and cities, and think tanks. Ensure active participation of women in the decision-making process.

(vi) Disseminate information on TA implementation to central, state, and local government departments and agencies; communities; the private sector; and development partners.

b. Technical Assistance Implementation

Provide TA management and implementation support to the Department of Economic Affairs, MOUD, and states or cities through TA management, monitoring, and reporting.

c. Technical Assistance Evaluation

(i) Based on the above key steps, develop a program performance monitoring system and build a smart platform for communications with clear accountability mechanisms at all levels.
(ii) Set up model reporting and baseline forms for preparation at the local level and consolidation by MOUD. Assist MOUD with consolidation and reporting at the national level.
(iii) Prepare guidelines for program evaluation at the state level upon completion (including recommendations for climate proofing). Assist MOUD in preparing an evaluation report for the entire mission in early 2018.
(iv) Extract lessons from TA implementation and provide recommendations for scaling up and replication in selected states or cities of India.

d. City Climate-Change-Resilient Action Plans

3. The consultant will deliver urban climate-change-resilient action plans for at least five cities to be finalized in agreement with ADB and the Government of India.[2] These plans should be integrated, to the extent possible, into existing city plans including upcoming programs and projects to be supported by ADB.[3] In doing so, the consultant will do the following:

(i) **Stakeholder engagement.** Conduct institutional and sector analyses and stakeholder consultations, particularly in understanding how the city works, examining its current status, and future trends (such as population growth and economic development). Apply known processes and tools for building urban climate change resilience. Ensure active participation of women in the decision-making process.
(ii) **Climate scenario and impact assessment.** Conduct risk and vulnerability assessments (sex-disaggregated and gender-related) based on exposure, hazard or disaster frequency and intensity, level of preparedness, infrastructure adaptation. Climate projections will be used to determine direct and indirect climate impacts. This process will involve collecting and analyzing data related to the following:
    (a) **Hydrometeorology and hydrogeology.** Assess these factors (e.g., river and sea levels, river flow, rainfall, cyclone frequency and intensity, storm surges, river and urban flooding, temperature, groundwater extraction, and water salinity) and the outputs of various modeling results and analyses in the target areas. Review and assess projections of future water withdrawal upstream. Utilize reliable secondary data as much as possible. Assess plausible climate scenarios (sea-level rise, increased intensity of rainfall and cyclones, storm surges) for 2030 and 2050. While analyzing the data and simulation results available, including the scenarios prepared in the fifth assessment report of the Intergovernmental Panel on Climate Change, make the best professional judgment in assessing future climate scenarios. Prepare at least two scenarios. Prepare digital maps of the assessment results using geographic information system (GIS) technology. The GIS-based digital

[2] Cities will be selected based on a multipronged approach combining (i) climate change exposure and vulnerability, (ii) urban local body willingness and commitment to climate change resilience, (iii) implementation readiness, (iv) ADB's presence in the state, (v) government priorities and implementing capacity, and (v) coordination with development partners.
[3] Consultants should refer to ADB publication on urban climate change resilience.

map will show flooded areas and duration, salinity intrusion, and other impacts of climate change under various model results.

(b) Existing infrastructure and future plans for extending and/or upgrading climate-resilient city urban infrastructure including water supply, sanitation and sewerage structures, storm water drainage, power supply, street lights, transport, pedestrian environments. Data to be collected can include the type, location, and capacity of water supply; drainage and wastewater treatment assets; water service coverage; and sewage disposal and sanitation systems coverage.

(c) Collect available socioeconomic and physical data, including population density; population trends; the location of slums; damage caused by past extreme weather events; and data related to public health, such as the incidence of disease related to extreme weather events, such as waterborne diseases. Data to be collected on physical characteristics include topography, land use, and land subsidence. Collect historical and projected data and, where data are insufficient, take actual measurements as needed.

(d) Review urban land-use plans, policies, and current local practices for coping with climate variability and extreme weather events, such as early warning systems and evacuation planning.

(e) Assess social and economic impacts on water supply, sanitation, and sewage and drainage systems, both qualitatively and quantitatively, including their public health implications and impacts on the poor.

(iii) **Vulnerability assessment.** Vulnerability assessments (sex-disaggregated and gender-related) will determine those populations within the city which will face high exposure and risk to climate impacts, and which have limited coping capacity to manage these impacts. Identify hotspots and key opportunities for resilience building.

(iv) **Determine investment requirements and costs for building resilience.** Based on the vulnerability assessment, identify structural and nonstructural options to build resilience while considering resilient city principles. This process will require the identification of the infrastructure investment requirements for future ADB support. Consultants should utilize proven methodologies in determining this requirement in consultation with various institutions working in this area (National Institute of Urban Affairs, Rockefeller Foundation). Provide options on the bases of a review and analysis of international best practices and proposed potential adaptation interventions such as the implementation of protection measures, changes in land use, emergency response mechanisms, and strengthening the regulatory framework. Consider, for example, relocating the intake of the proposed water treatment plant, assessing the abstracted volume of groundwater, optimizing the design of drainage systems, and selecting the location of sanitation facilities. Make a preliminary assessment of the feasibility of each option, with due consideration of effectiveness, urgency, associated benefits and costs, and social acceptability; and identify the agencies responsible for implementation. Analyze the pros and cons of each proposed intervention and preferred options through a participatory approach.

(v) **City resilience strategy development.** Prepare a city-level climate-change-resilience strategy, including aspects of improved risk preparedness and disaster risk management. Consider recommendations in areas such as social resilience, land use planning, urban ecosystems and upgrading, and integration of resilience in the project cycle. In all cases, assess the application and relevance of

information and communications technology-based systems (global positioning system-enabled, GIS).

(vi) **Prepare city-level action plans.** Prepare city-level action plans for mainstreaming climate resilience, considering the following areas: (a) water cycle management, (b) low-carbon transport, (c) energy management (including energy efficiency in buildings and street lighting, emergency power supply systems, (d) communications, and (e) other city services (e.g., solid-waste management). The city-level action plan should comprehensively tackle policy, institutional, and resourcing in addition to infrastructure provision.

2. Output 2: Climate Change Resilience of Infrastructure and Project Development Supported

4. A key activity of the TA is support for project scoping, and preparation for scaling up such plans to fill infrastructure and service delivery deficits so as to build urban resilience through future ADB support. Consultants will deliver prefeasibility studies and feasibility studies for selected cities covering areas of urban climate change resilience.[4]

3. Output 3: Institutional Capacity, Community Awareness, and Knowledge for Sustaining Climate-Change-Resilient Cities Strengthened

5. The TA will prepare and deliver capacity building and education programs for various stakeholders (city managers, population, women's groups). Training programs will target mainly key central, state, and local government officials to improve their capacity for assessing and responding to climate change impacts and risks, and include the following activities:

(i) Plan and conduct training programs and workshops for key stakeholders to raise awareness of and develop skills for better adapting to climate change.

(ii) Disseminate information on TA implementation to relevant central and local government departments and agencies, communities, the private sector, and development partners. Ensure effective participation and conduct workshops in Delhi and selected states and/or cities.

(iii) Ensure that information and education for the community (under output 4) is applied equally to men and women of different groups. This may imply using different messages, channels of communication, and languages depending on factors such as education level.

(iv) Incorporate environmental and social safeguards into urban planning.

(v) Provide recommendations for further capacity building and awareness raising programs.

(vi) Develop at least one knowledge product highlighting lessons learned in the development of urban resilience in India.

(vii) Evaluate capacity building programs undertaken during the TA, and prepare future programs to be carried out during the implementation of priority actions.

(viii) Prepare printed and web-based knowledge and communication materials with recommendations for scaling up and replication in other areas of India.

(ix) Design city twinning partnerships for peer-to-peer learning and operationalize them.

(x) Organize and execute foreign exposure visits related to urban resilience which may be replicated using the Indian context.

[4] Studies will include safeguards due diligence in accordance with ADB's Safeguard Policy Statement (2009).