



RESILIENCE – Making Indian Urban Cities Climate Smart

The challenge of delivering climate smart development in India will largely be played out in Indian cities over the next 30 years. Indian Cities will continue to grow in population, generating 70% of future energy demand, exposing increasing numbers to climate hazards such as flooding, cyclones, heat waves and generating high emissions - if policies and investments are not put in place now to ensure India urbanises sustainably.

India’s policy response to the needs for sustainable, resilient and low-carbon cities is the [Smart City Mission](#) that promotes “cities that provide core infrastructure and give a decent quality of life to their citizens, a clean and sustainable environment while applying ‘Smart’ Solutions.”

“We will help India to make its urbanisation work and make cities real engines of growth by boosting business and creating employment”

International Development Secretary Priti Patel during her visit to India in August, 2016.



KEY MESSAGES

Multi-stakeholder dialogues for development of action plans is an effective way of supporting city partners.

The existing evidence base used in a convincing manner can mobilise national and sub-national resources.

Programmes and institutions for blue-green infrastructure need to access national and international climate finance.

Establishing partnerships and processes for co-ordination between national and state actors needs to be supported to bridge gaps between national strategy and city level implementation.

Cities require project development support to effectively mobilise local resources.

The mission acts as a driver of demand for smart technology and solutions. The India - UK [Smart Cities for growth partnership](#) has supported this mission by supplying national and international expertise on urban planning, designing and building smart cities. These partnerships will create jobs, growth and prosperity for India and the UK. The partnership has focused on infrastructure, climate smart development, clean energy, governance, water and waste management, risk insurance and green financing.

Future Proofing Indian Cities

The [Future Proofing Indian Cities](#) programme used existing evidence to identify risks and vulnerabilities related climate and non-climate stressors . The framework was developed by ATKINS and University College of London (UCL) in partnership with Department of International Development (DFID) UK.

The partnership assessed 59 Indian cities for environmental risks to their economic and social development. The analysis showed that Indian cities face a wide range of risks from climate hazards, and resource scarcities. These risks are increased by investment in unsustainable energy, building and water infrastructure that does not take the climate risks into account - leaving a significant number of people highly vulnerable to climate change. To address this issue the India-UK partnership supported projects across various States of India ([Mysore](#), [Madurai](#), [Bangalore](#), [Aluva](#)) to develop future proofed urban development strategies and investment plans that lead to environmental, social, and economic co-benefits.

FUTURE PROOFING CITIES

Mysore

Applying Low Carbon Planning and Design Tool identified areas to reduce city's emission intensity and presented integrated urban planning options and ready-to-invest projects

Madurai

Applying wide range of stakeholder engagement process co-created City Action Plan around future proofing blue-green infrastructure.

Bangalore

Developed city action plan identifying wide focus and transformational opportunity for water and sanitation infrastructure

Aluva

Developed masterplan for the next 50 years and identified investments opportunities in transport, flooding proofing and solid waste.

The key outcomes of the projects were:

- Availability of a robust evidence base on the range of environmental and climate risks being faced by the cities under current and future carbon scenarios.
- Detailed responses to the risks identified - working with the city officials and citizens of the city, to generate wider environmental, social and economic benefits within the cities.
- Ready-to-invest project and investment plans in four key infrastructure priorities: transport, flooding, eco neighbourhoods and solid waste management.
- Improved awareness among all stakeholders of the cities and capacity in each city to respond to risks.
- Improved coordination, collaboration and mobilisation of key city stakeholders in identifying and developing options for future proofing.

For more insight reference refer to [CDKN's INSIDE Story on Madurai](#)

Smart City Cooperation

A second phase of the India-UK partnership shared skills and expertise in finance, job creation and infrastructure to support Modi's ambitious plans for Smart Indian Cities, including establishment of a Strategic Programme Management Unit for the Smart Cities Mission. At the city level the UK has already partnered with Amravati, Pune, Varanasi and Indore to provide cutting-edge solutions in urban planning, development of intelligent transport systems, big-data and energy systems. **By working together the bilateral partnership will support climate smart development of Indian cities and leverage private sector investment and expertise to deliver Modi's vision for India's 21st century cities.**

Disaster Proofing Indian Smart Cities

This project was conceptualised to share UK technical and design expertise to support the climate resilience of towns and cities in India that are entering India's 'Smart Cities Mission'. Many towns and cities are prone to multiple geological and climatic hazards and as part of the Smart City process such cities may deploy Digital Information Technology (DIT). When a natural hazard occurs, cities depend heavily on DIT systems for critical emergency services. Therefore, DIT must be specified that can continue to deliver critical functions during disasters. As part of this project implementers engaged with a number of cities and prepared a [guidance document](#) on climate resilience of DIT which will help Smart City planning and procurement teams when selecting and purchasing DIT, particularly for emergency services. It can also be used by those who are developing and innovating products and services for Indian Smart Cities as they will benefit from a targeted overview of what is an appropriate product or service for Indian climatic conditions.

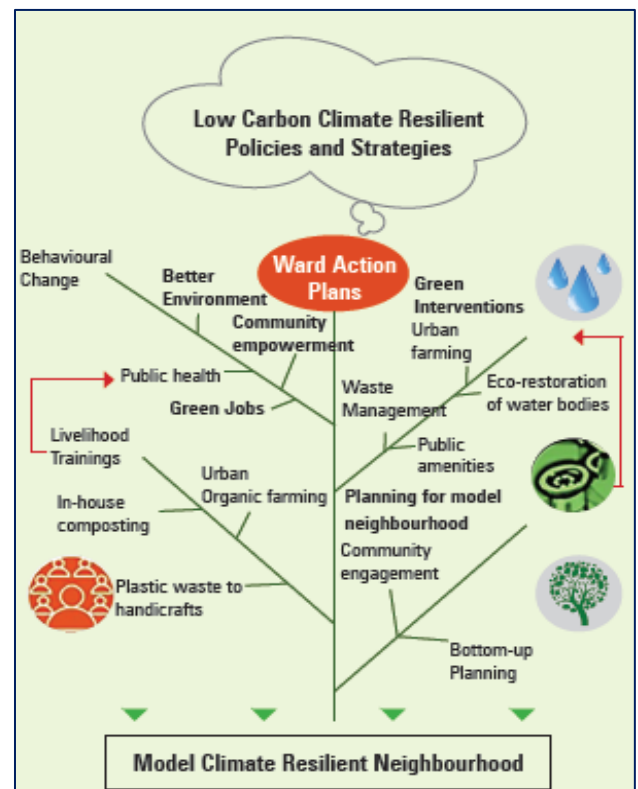
Roadmap for Low Carbon and Climate Resilient Kolkata

During the visit of the UK Prime Minister, in November 2013, the UK Government signed a [Memorandum of Understanding \(MoU\)](#) with the Kolkata Municipal Corporation on green growth and climate resilient Kolkata focusing on three areas:

- Preparation of a [roadmap for low carbon and climate resilient development of Kolkata](#)
- Strategies to strengthen institutional capacity of KMC to implement the Roadmap
- Sensitisation programme for key stakeholders within KMC on green growth of the city.

Several innovative pilot projects have been proposed under Climate Resilient Disaster Management, Climate Smart Mobility, Climate Smart Land-Use, Energy Efficient Built Environment and Utility Services, Roof-top Solar plans, Water Conservation and Solid Waste Management.

Implementation of this roadmap will make Kolkata India's first climate resilient city.



Lessons Learnt from DFID India Urban Investments over 20 years

UK initiatives [in urban development sector, since the early 1980's has focused on West Bengal, Bihar, Odisha, Andhra Pradesh Telangana and Madhya Pradesh](#) and initially focused on three intervention areas.

- **Slum improvement** during starting phase
- **Supporting reforms of urban local bodies (ULBs)** during mid-life of the programs, and
- **Addressing sector wide reforms focussing on urban policies and regulations to reform urban markets**

Work supported by the UK Government has influenced national and state priorities on policy reforms, e-governance, and energy saving initiatives. **Some of the [key learnings](#) for DFID for identification of themes and spearheading the urban programme design formulation include:**

- **Initial needs assessment, appraisal, and project design involving the participating state and nodal agencies during programme design stages is key to successful programme implementation**
- **Step wise capacity building and working in-hand with municipal cadre at ULBs and State will lead to long-term sustainability of the reforms**
- **Involvement of civil society organisations plays a critical role in helping engagement with community build their resilient capacities.**

INCREASING RESILIENCE TO EXTREME HEAT ACROSS INDIAN CITIES

On Thursday 19 May 2016, India experienced an all-time record high temperature for any calendar day. The temperature reached 51°C in the city of Phalodi in the Jodhpur district of the state of Rajasthan, demonstrating the need for-planned "[Heat Action Plans](#)" such as those developed by CDKN.

In September 2016, the National Disaster Management Authority (NDMA), World Health Organization and National Institute of Urban Affairs, and Rockefeller Foundation "[Roadmap on National Heatwave Management in India](#)" and launched "[Guidelines to Heat Action Plan Development](#)" based on CDKN's work.

More recently CDKN also launched "[The Raising Risk Awareness Project](#)" The analysis found that:

- Annual mean temperatures across India are increasing.
- Extreme heat waves in India are becoming more frequent and intense

A [City Resilience Toolkit](#) was launched by the Natural Resources Defense Council at COP21 in Paris (December 2015). The Toolkit sets out how to develop an urban Heat Action Plan.



“The Ahmedabad Heat Action Plan is a necessary step towards protecting our communities from extreme heat and a beautiful model for future climate adaptation efforts.”

D. Thara, Ahmedabad Municipal Commissioner
(October 2014 to June 2016)

“CDKN offered opportunity to integrate public health and risk to heat wave in urban settings starting from of Ahmedabad to four other states and 10 other cities of India”

Dr. Dileep Mavalankar, Director Indian Institute of Public Health Gandhinagar

Opportunities Ahead:

- Future proofing India’s Smart Cities will require cities to integrate climate risk information into city planning, design and operation, as well as into policies and programmes.
- Big-data analytics from can support cities make more insightful investment and operational decisions to improve service delivery and efficiency for departments.
- For effective and efficient delivery of public services, cutting-edge smart technologies and digital platforms offer cities and technology providers opportunities to reinvent urban local bodies and build the climate compatible infrastructure of the digital age.
- A mix of financial instruments offered by various national and international financial institutions including multi-lateral and bi-lateral development partners and the private sector can reduce the real and perceived risks of investment and attract long-term finance.

List of projects:

Project Title
Future Proofing Indian Cities - Key findings from applying a future proofing approach in Bangalore and Madurai , CDKN
Roadmap for Low Carbon and Climate Resilient Kolkata , BHC with PwC and others, Kolkata
Integrated City Development, a holistic approach to a low carbon and resource resilient future – Planning and Design Handbook , Atkins, UK
Research into Lessons Learnt from DFID India Urban Investments over 20 Years , Oxford Policy Management, UK
Future Proofing – Aluva , Atkins, UK
Disaster Proofing Indian Smart Cities - Climate Resilience of Digital Information Technology , Arup, UK
Technology, Innovation & Partnerships for Transformational Change in Climate Change , ORF, India
Smart Cities Assessment, India, Opportunities for Businesses



British
High Commission
New Delhi



This document is an output from a project supported by FCO India, under Prosperity Fund Program. While every effort has been made for the correctness of data/information used in this report, neither the authors or CDKN accept any legal liability for the accuracy or inferences for the material contained in this report and for any consequences arising from the use of this material.

