

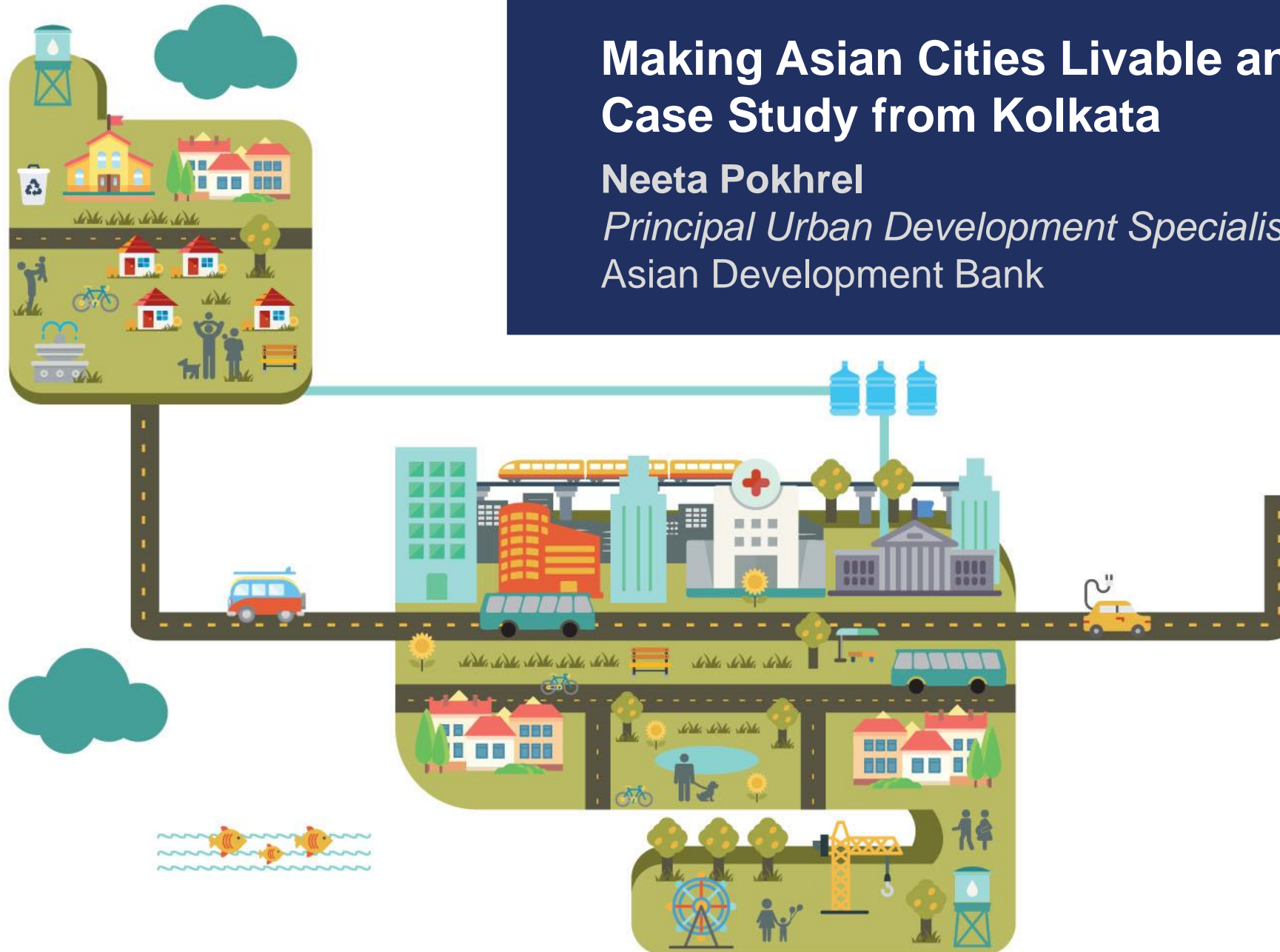
Making Asian Cities Livable and Smart

Case Study from Kolkata

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Asian Development Bank

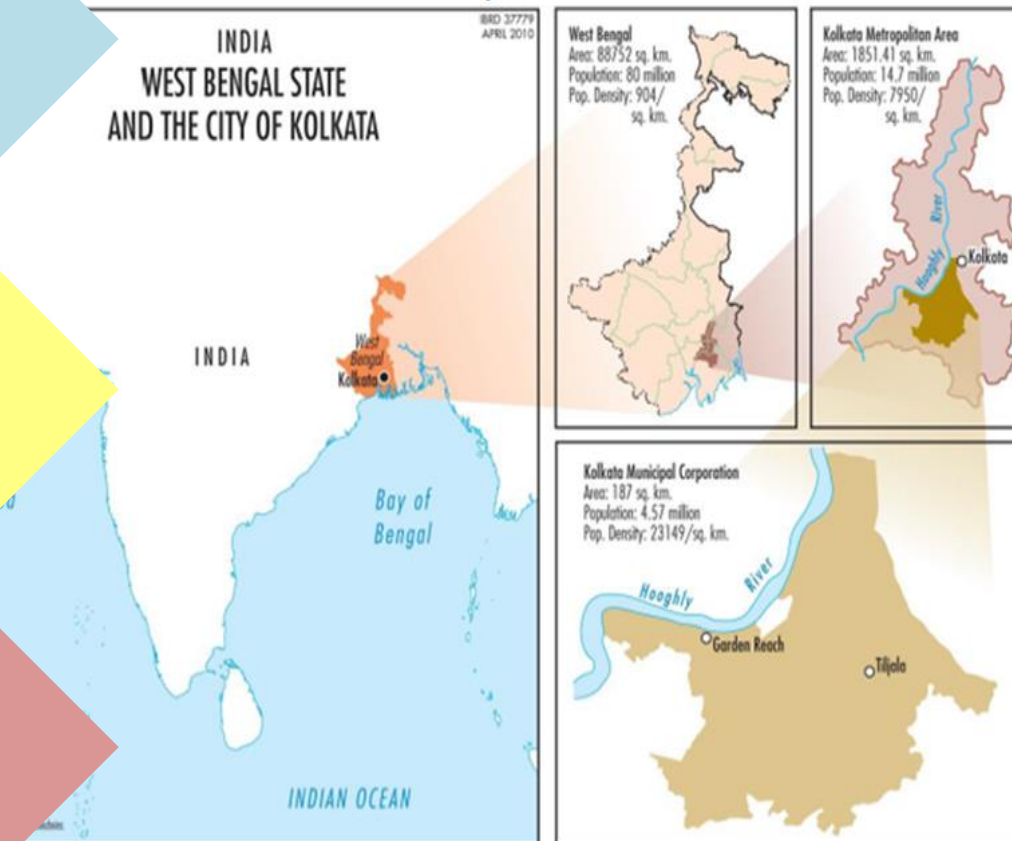


ADB

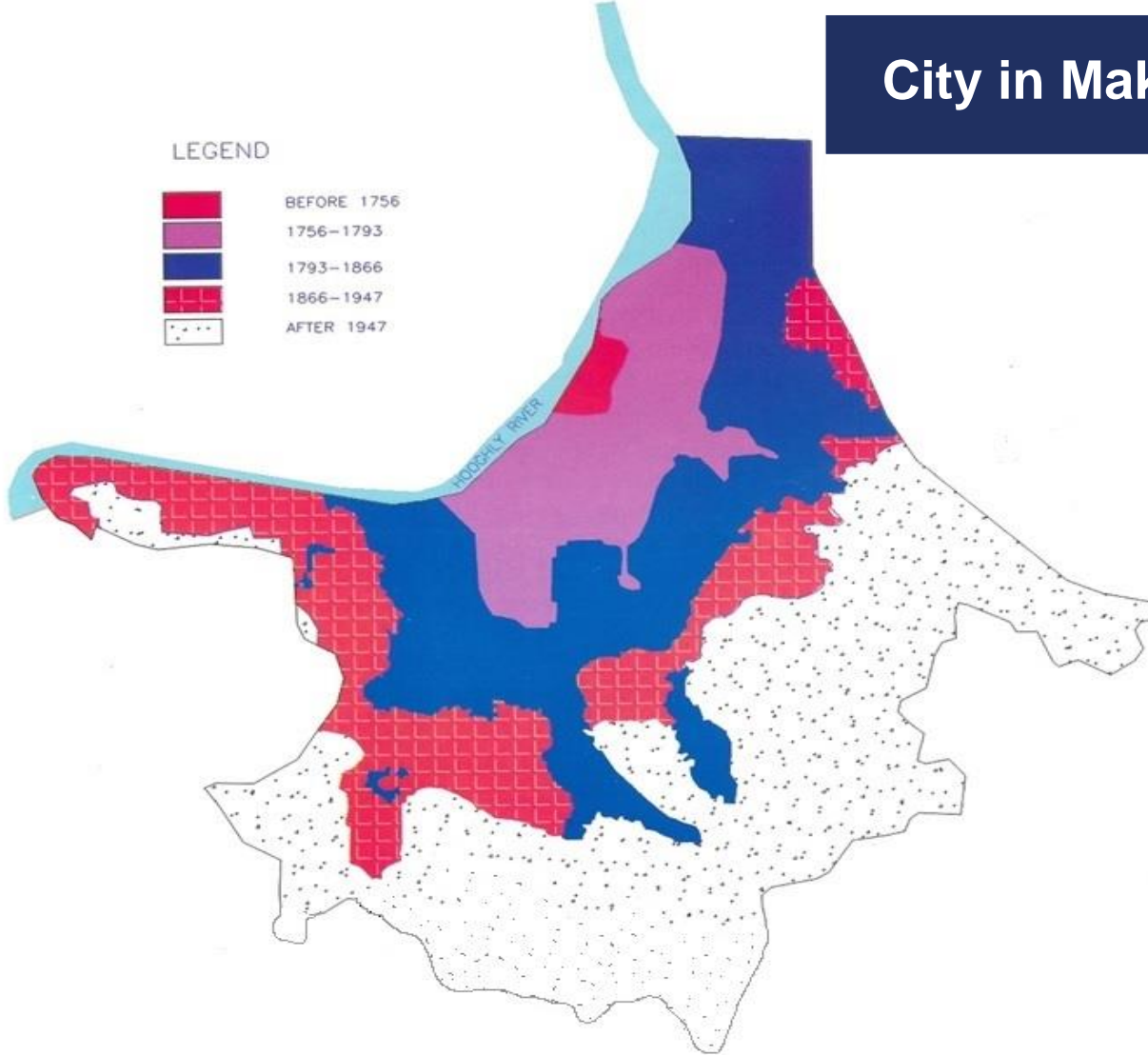
Capital city of 4th most populous state (West Bengal), and 6th largest GDP contributor, in India

**Over 5 m permanent & over 3m floating population (KMA – 14.5 m),
24,250 people per sq. km**

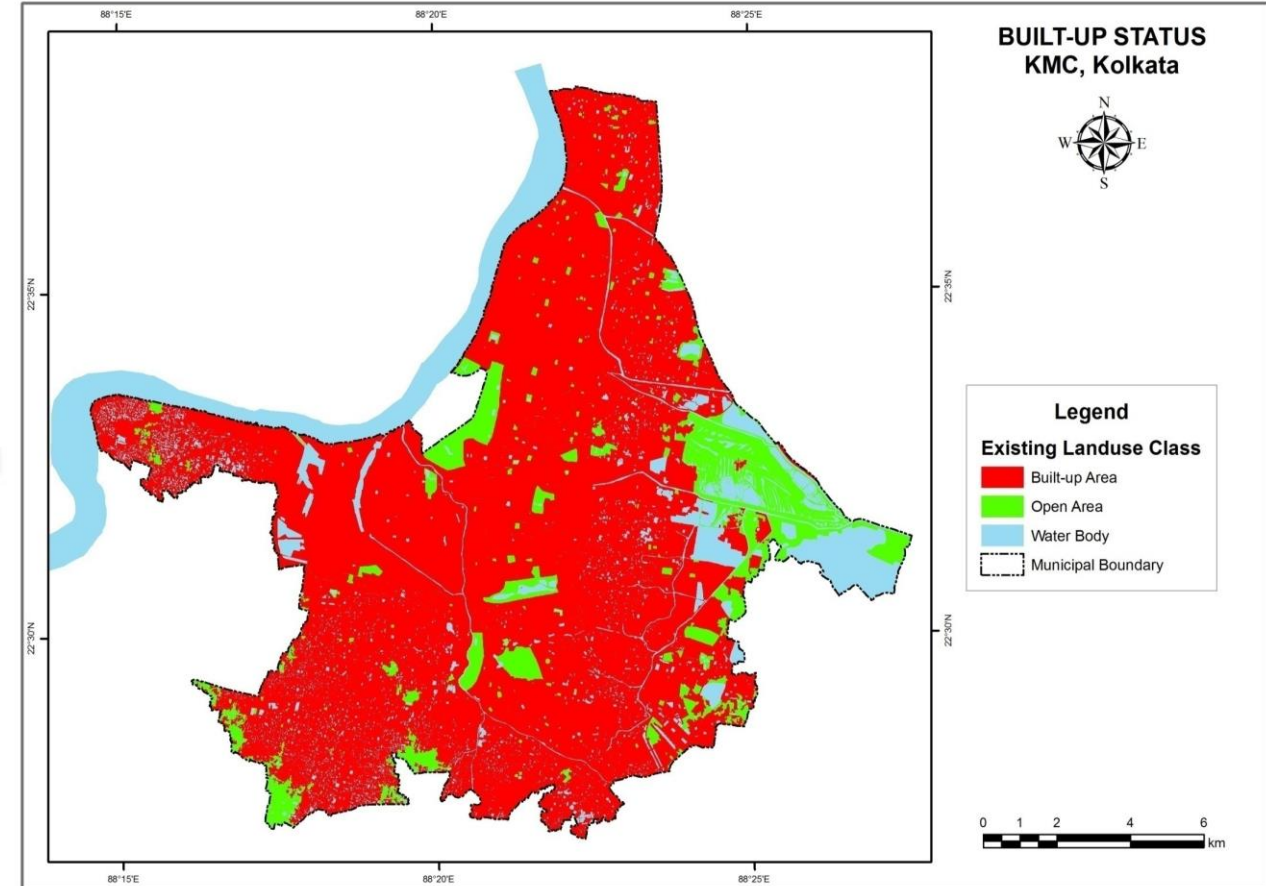
Established in 1876, KMC is one of the oldest municipal corporations in India



City in Making Over 300 Years



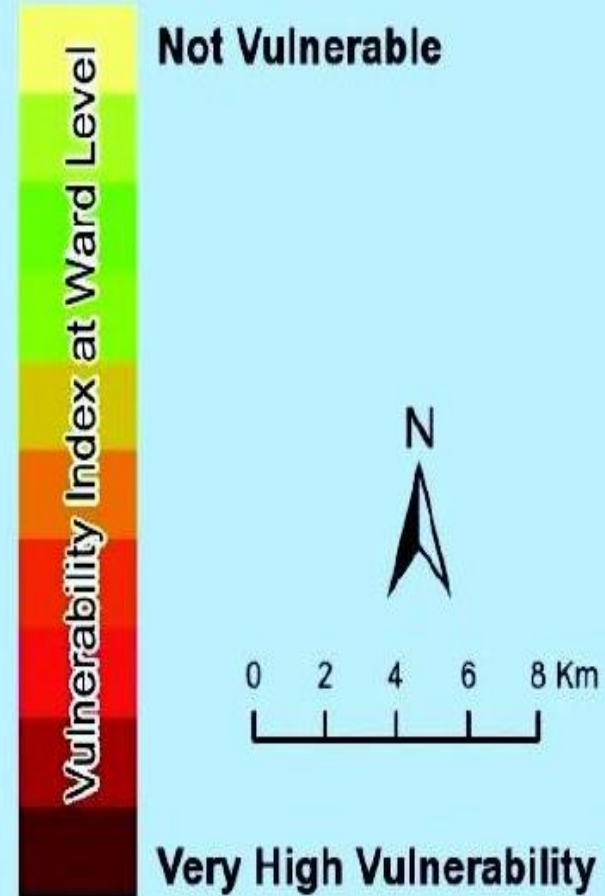
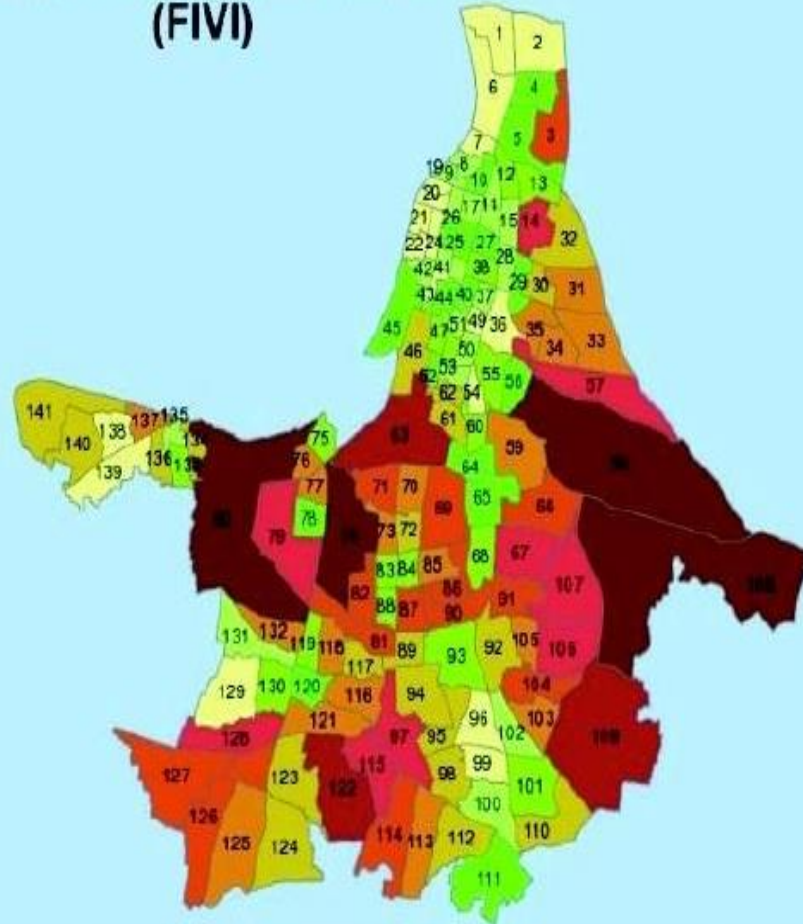
Kolkata city: 1756- 1947



Kolkata city: 2008

Ranked among top ten costal cities highly vulnerable to flooding and impacts of climate change

**Flood Vulnerability Index
(FVI)**



ADB's Support to KMC – It's been a two-decade long partnership

1998

- Technical assistance grants for accounting reforms and project preparation

2000

- Kolkata Environment Improvement Project (KEIP) (\$250 million)

2007

- Supplementary Loan to KEIP (\$80 million)

2014

- Multi tranche financing facility for Kolkata Environment Improvement Investment Program (KEIIP) (\$400m), Tr 1 (\$100m)

2016

- Tranche 2 of KEIIP (\$200m)

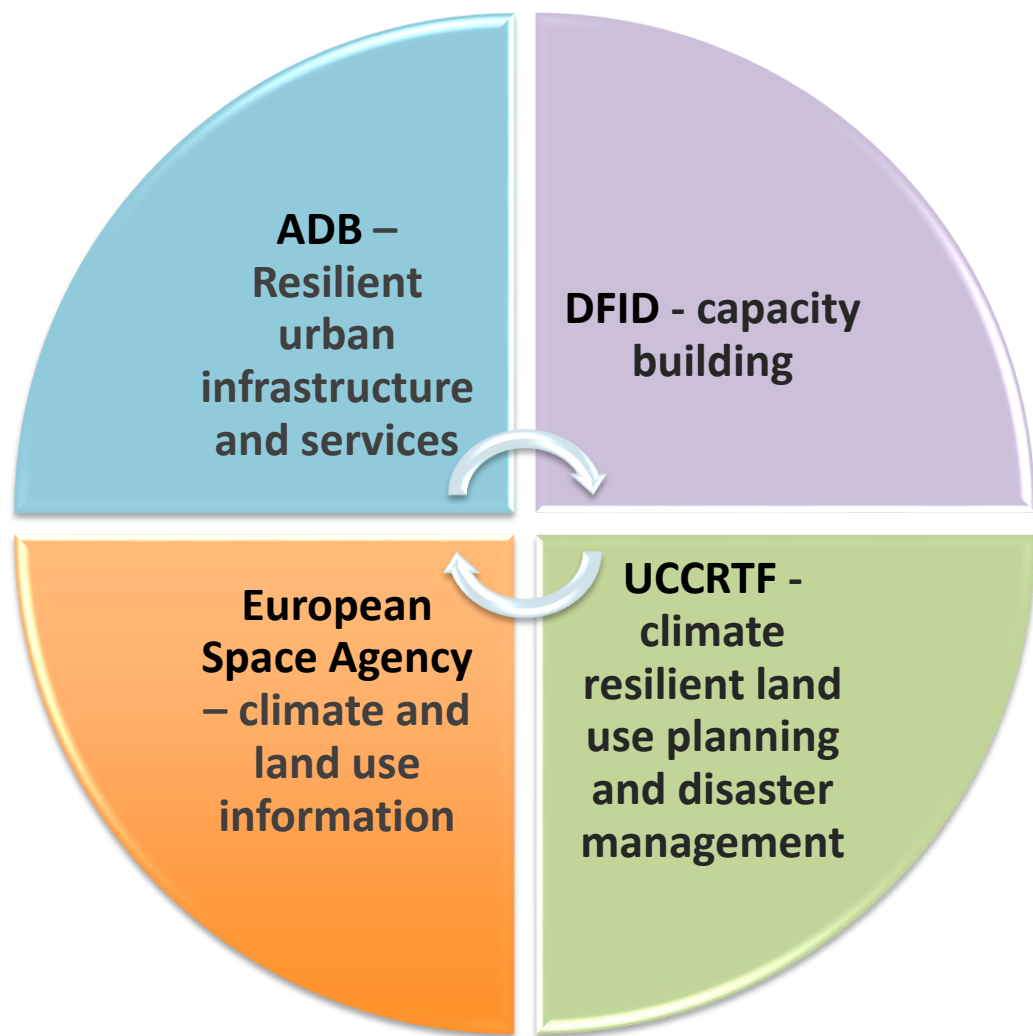
2018

- Tranche 3 of KEIIP (\$100m)

2020

- Proposed Kolkata Resilience Improvement Project

Making Kolkata City Livable, Resilient, and Smart –Key Partners



THE WORLD BANK



Modernizing and Digitizing KMC's financial, administrative, planning, and asset management systems



Upgrading accounting, financial management, and administrative systems

Modernizing city's payroll and citizen payment system)

➤ Property tax reforms – shift to unit-area-based system - Web-based citizen's interface, online taxes and public utility bills payment

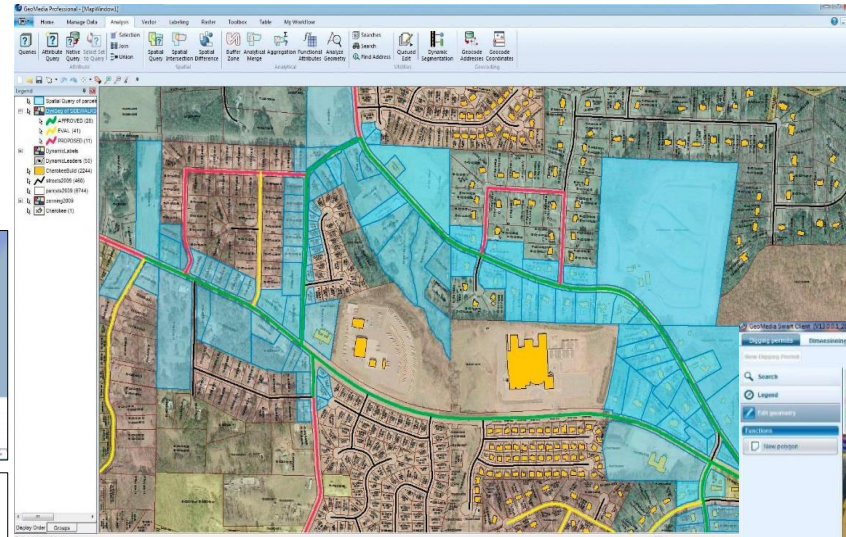
Utilizing Hexagon geospacial technology for better planning and asset management (35 layers on GIS base map of the city)

CRISIL reaffirms “CCR A+/ Stable” rating to KMC in October 2017
It's a long journey from never having KMC's books audited prior to 1999.

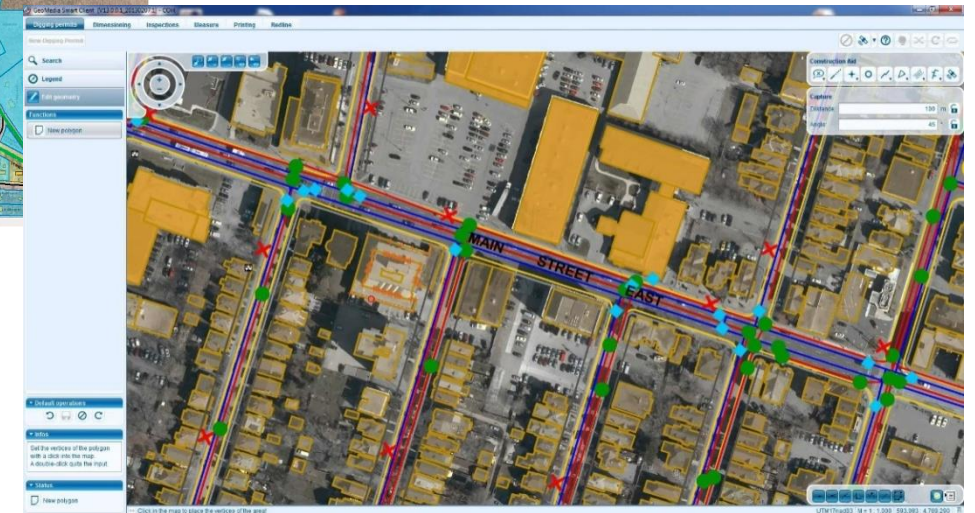
Utilizing Hexagon Geospacial Technology for Effective Asset Management, Planning, Collaboration, and Service to Citizens



GeoMedia WebMap



GeoMedia Desktop



GeoMedia SmartClient

Kolkata city's map with 35 layers data, including all properties, assets, and over 250,000 km of utility network, on an interactive GIS and web-based platform available from March 2019.

Modernizing and Digitizing Urban Services Monitoring and Management



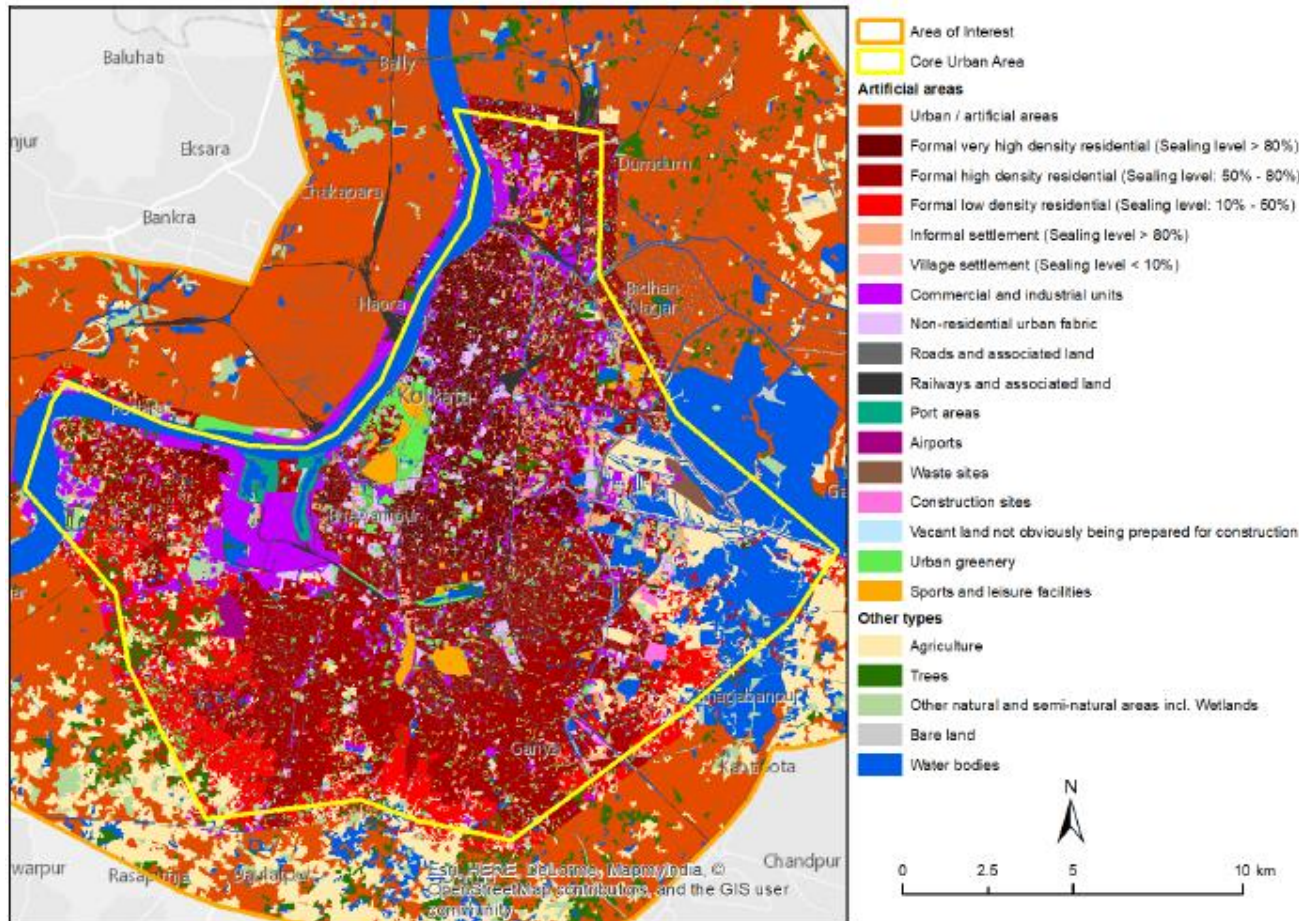
Hydraulic modelling to prepare comprehensive and climate resilient sewerage and drainage masterplan, water supply improvement plans

SCADA systems; instrumentation across the system; digitization of maintenance depots and customer services

Using smart sensors in public transport, Vulnerability mapping for making public spaces inclusive

Urban land use planning, disaster management, SWM planning, with remotes sensing data analysis

Remote Sensing for Improved Municipal Planning and Disaster Management

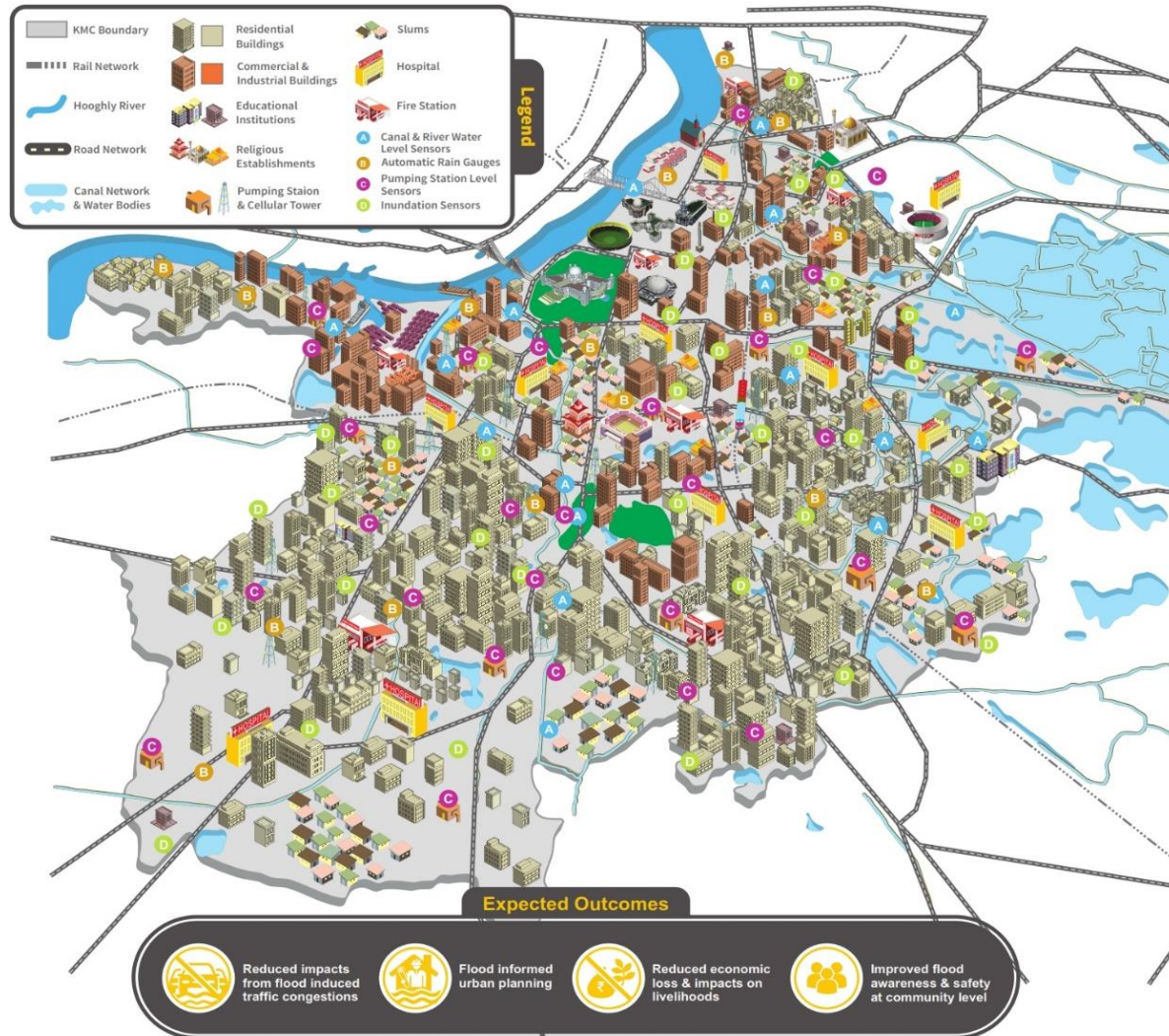


ADB and European Space Agency's have partnered, under the Earth Observation for Sustainable Development (EO4SD) program, for Kolkata's satellite mapping and analysis on:

- Urban & peri-urban land use/land cover
- Urban extent
- Imperviousness
- Urban green areas, and
- Informal settlements

Designing and Installing State of the Art Flood Forecasting and Early Warning System

Flood Forecasting and Warning System (FFWS) is being implemented as a flood management and mitigation initiative. About 400 real-time sensors are proposed to be installed to monitor flooding across vulnerable areas and status of storm water drainage system across the city. The data will be communicated to the KMC control room and the real-time status of inundation will be displayed on the Flood Monitoring Dashboard. The dashboard will also integrate precipitation forecasts and provide scenarios from past and expected extreme events. The dashboard can be accessible to computers and mobile phones through internet. It will provide location specific SMS alerts to enable pre-emptive action. This will aid in developing flood informed urban development and management.



One of the first comprehensive early warning systems for a city in India

Multi-parameter monitoring of other climate-related data

High-density coverage through cost-effective sensors

Provision for crowdsourcing

Can be Accessed Anywhere

Cloud-based data collection, processing, and storage

Flood scenarios

Simple monitoring of storm water drainage system