

Operationalizing Climate Risk Informed Urban and Territorial Planning- Experiences and Lessons from Indian Cities

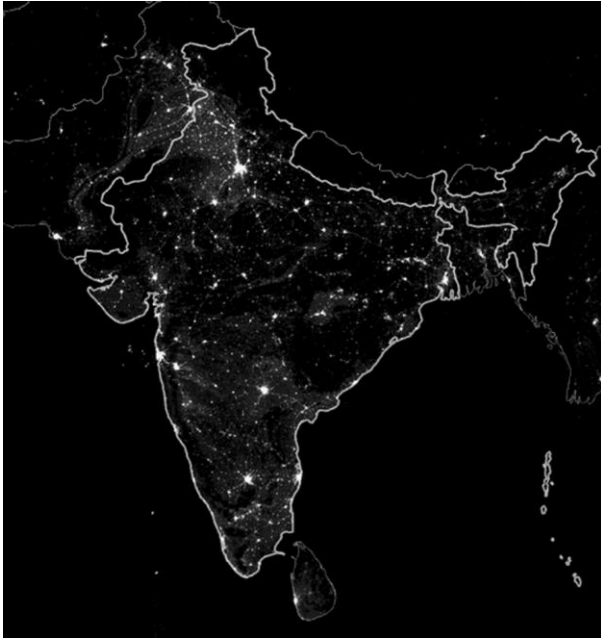
5th Spatial Planning Platform (SPP), 2023, Kathmandu, Nepal



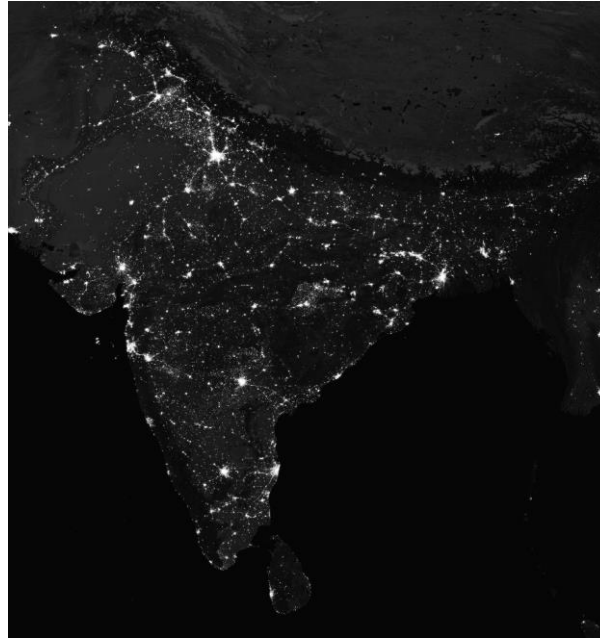
Dr. Saswat Bandyopadhyay
3rd February, 2023

India's Urbanization through Night Light Data (NASA)

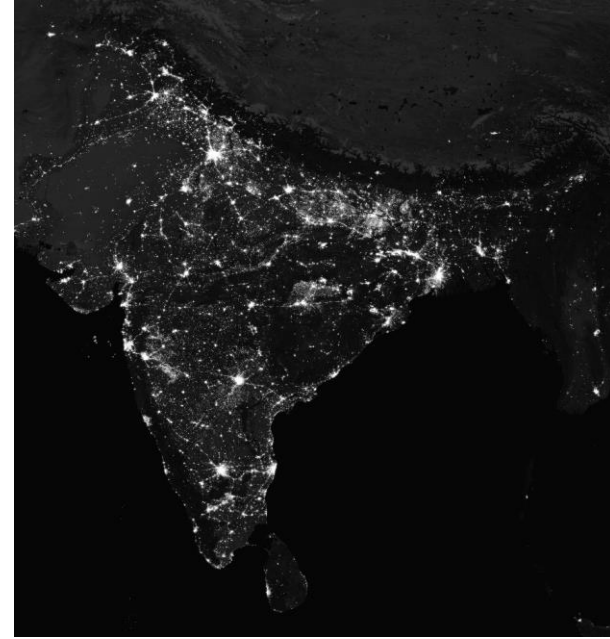
India@2011 was home to 377 million, about 11% of the Global Urban Population



Night Light Map: 2005



Night Light Map: 2012



Night Light Map: 2022



India Urban - 6:30:65

- 6% (205000sqkm) of the country's area
- 30% of the population (urban density @ 1400/sq.km)
- 65% of the country's economy
- Each sq km of urban space contribute approximately INR 4.0 Cr (INR 40 Million) to the GDP

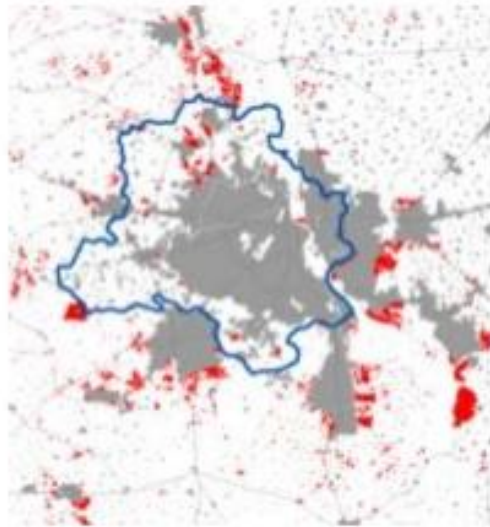
India@2022-2047- Urban Amrit Kaal

- India @ 2047 expected to double its urban population have over 800+ Million Population with over 10000+ Settlements in next 25 years*
- India @2047 expected to be an economy to the tune of around USD30-35 Trillion*80-85% of which is expected to be from the urban*
- India's High Pace of Economic growth is expected to trigger several urban industrial growth corridors- Safety and Sustainability of future Indian cities will be key
- In this urban transformations, the role of Climate Risk Informed Spatial and Territorial Planning will be the key

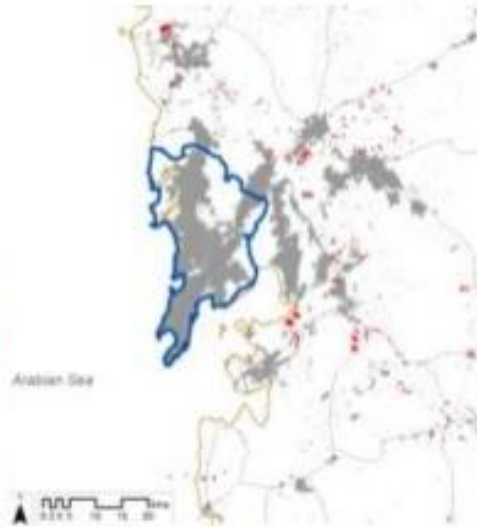


Urban Sprawling and Hapazard Expansion

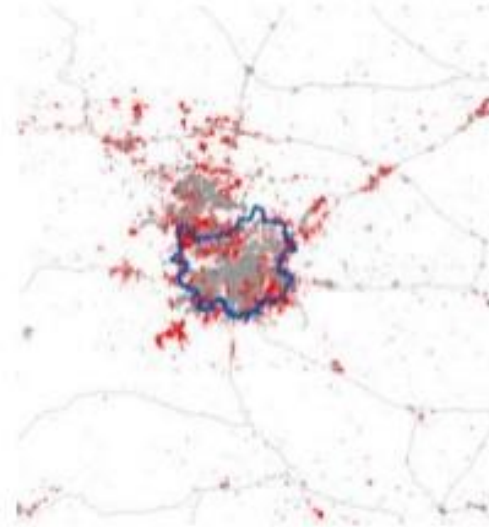
Inevitable **Urban Expansion** in Indian Cities...



Delhi NCR
54 sqkm/ year



Mumbai
5 sqkm/ year

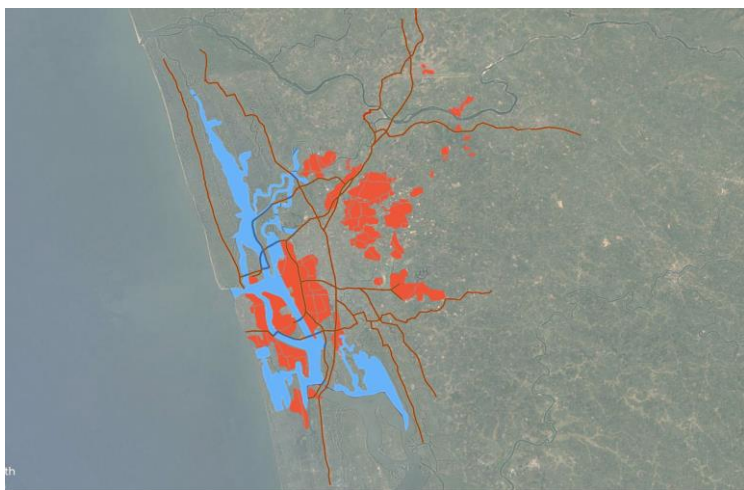


Pune
42 sqkm/year

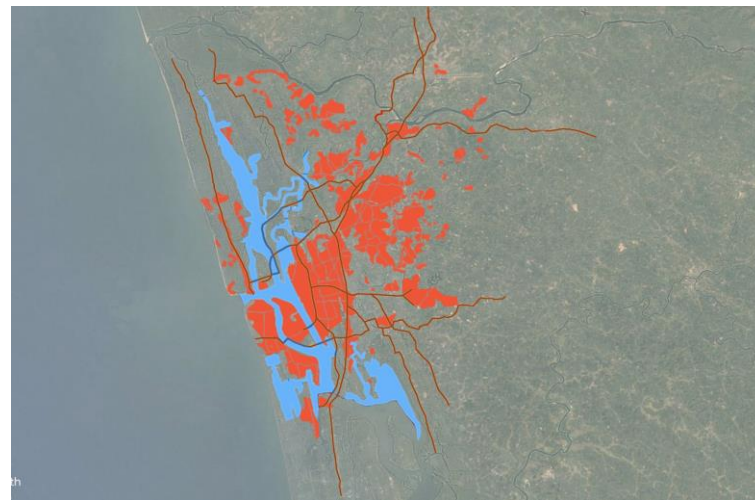


- Rapid growth in satellite towns of Delhi (Gurgaon, Noida, Grt Noida, Faridabad etc)
- Mumbai, little movement in peripheries, but witnessing inner city redevelopment
- Pune capitalising on Mumbai's slow down, attracting new economies like IT/ ITeS.

Source: Generated by WRI India using data from Bhuvan NRSC



1991-26.40 Sq.km



2001-42.96 sq.km



2014-58.02 Sq.km

Impact of Urbanization over Environment

Impact on biosphere

- Modification of Habitats
- Destruction of Habitats
- Creation of New Habitats

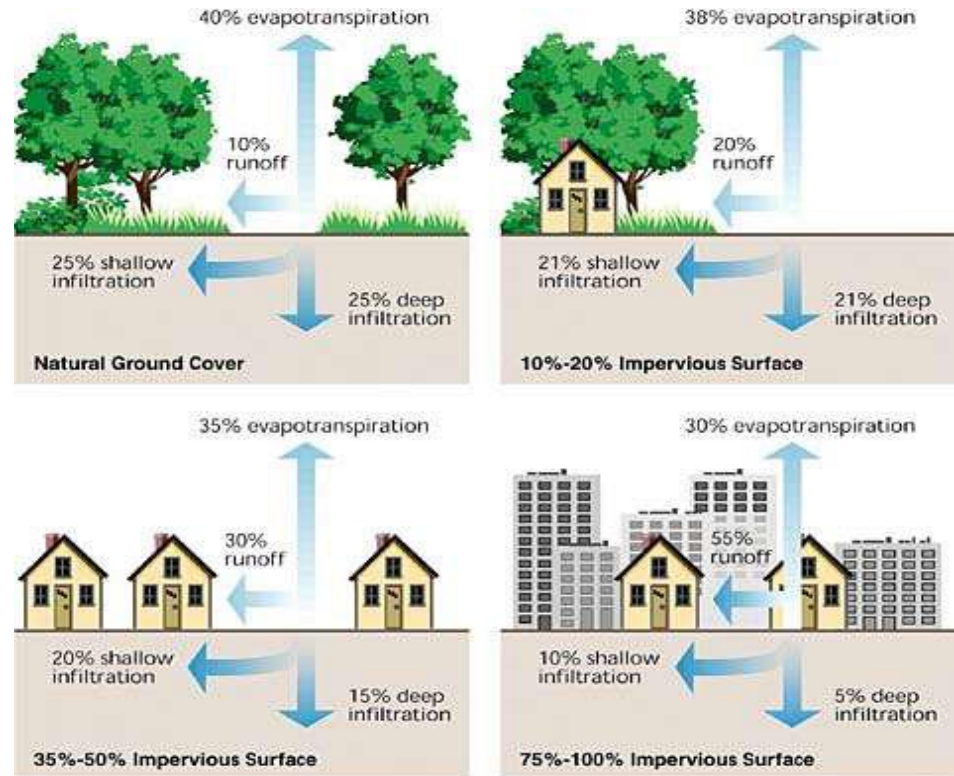
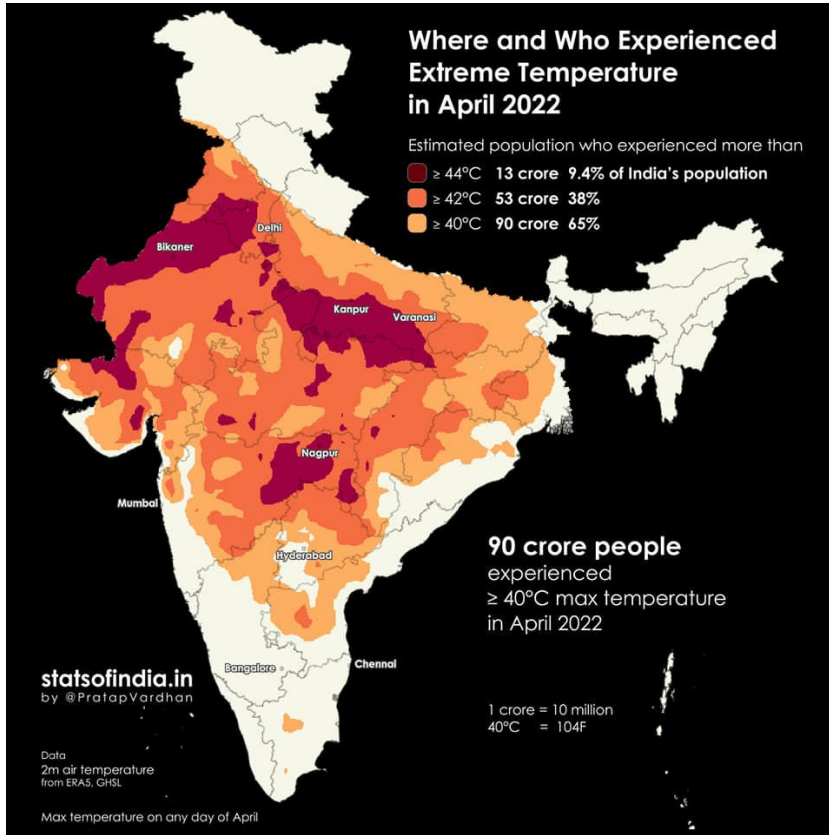


Fig. 3.21 — Relationship between impervious cover and surface runoff. Impervious cover in a watershed results in increased surface runoff. As little as 10 percent impervious cover in a watershed can result in stream degradation.
In Stream Corridor Restoration: Principles, Processes, and Practices (10/98).
By the Federal Interagency Stream Restoration Working Group (FISRWG) (15 Federal agencies of the U.S.)

- Indian Cities are at the forefront of Climatic Vulnerability
- Cities are the key contributor of GHGs and at the same time, are at the forefront of Vulnerabilities

Indian Cities are at the forefront of Climatic Vulnerabilities



Instead of a rigid land use, Indian Cities are required need to develop flexible strategies towards Complex Adaptive Requirements of an increasingly uncertain future



A CAB RIDE IN GURGAON

cab stranded in a waterlogged service lane at Narsinghpur on the Gurgaon-Delhi expressway



Key Climatic Risks

1. Sea Level Rise and Coastal Erosion
2. Heavy Rainfall and Flooding
3. Rising Temperature and Urban Heat Island
4. Water Scarcity
5. Changes in the Biological Systems

Role of Risk Informed Spatial And Territorial Planning in
Advancing the Climate Resilience Actions in Indian Cities

Why Urban Spatial Planning?

Framework for provision
of Public Goods and
Services

Ordered Development
and Minimization of Land
Use conflicts

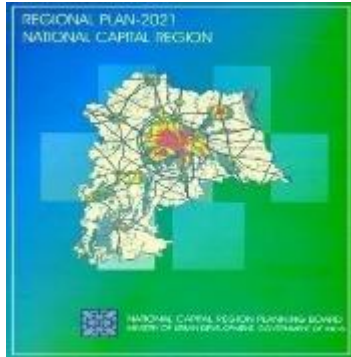
Tool for incorporating
Public Interests into
development of land and
coordinating multiple
activities

Managing Negative
Externalities

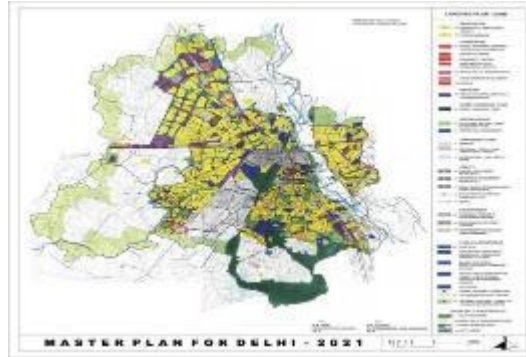
Implementation of Plans
through Infrastructure
Development and
Development Control
Regulations

Potential Tool for Value
creation and Land Value
Capturing

SUMMARY OF SPATIAL AND TERRITORIAL PLANNING TOOLS IN PRACTICES



Regional Plan



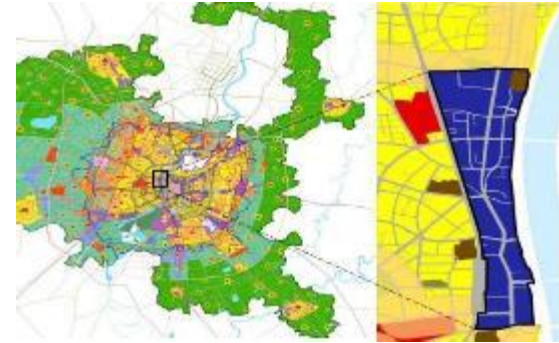
Master Plan



Zonal Plan



Town Planning Scheme Plan



Local Area Plan

Urban Planning in India

Statutory Urban Planning Tools	Non Statutory Tools
Regional Planning (Maharashtra)	
Development Plan /Master Plans	JnNURM CDPs Smart City Plans City Sanitation Plans Mobility Plans Climate Action Plans Blue and Green Plans etc City Bio-diversity Plans City Heritage Plans
Zonal Development Plans	
Town Planning Scheme/Local Area Plans	Urban design proposals, Streets for people/ proposal for pedestrian /bi-cycle corridors

Some Important Initiatives at the National Level

Urban Reforms # 5
Creation of Sponge
Cities

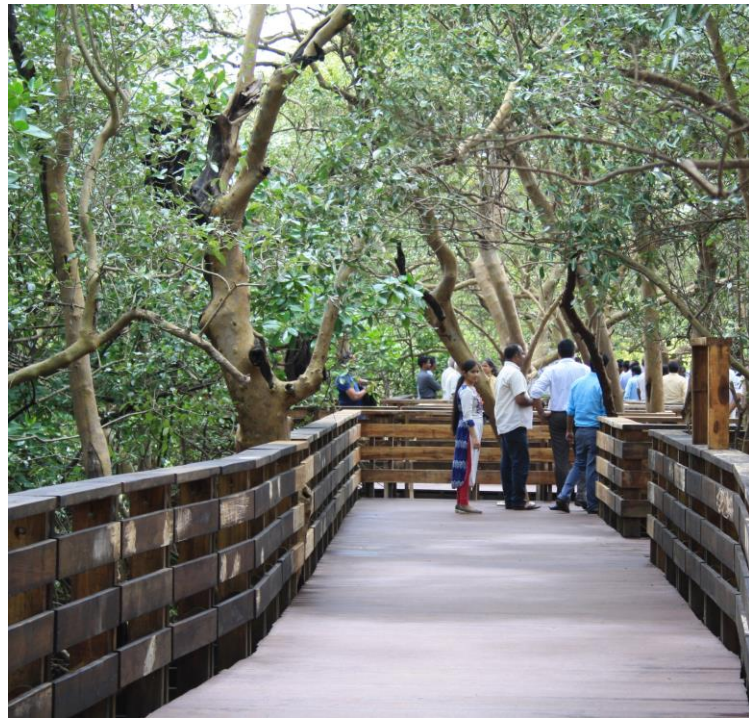
Amrit Sarovar
Rejuvenation of
Urban Water
Bodies

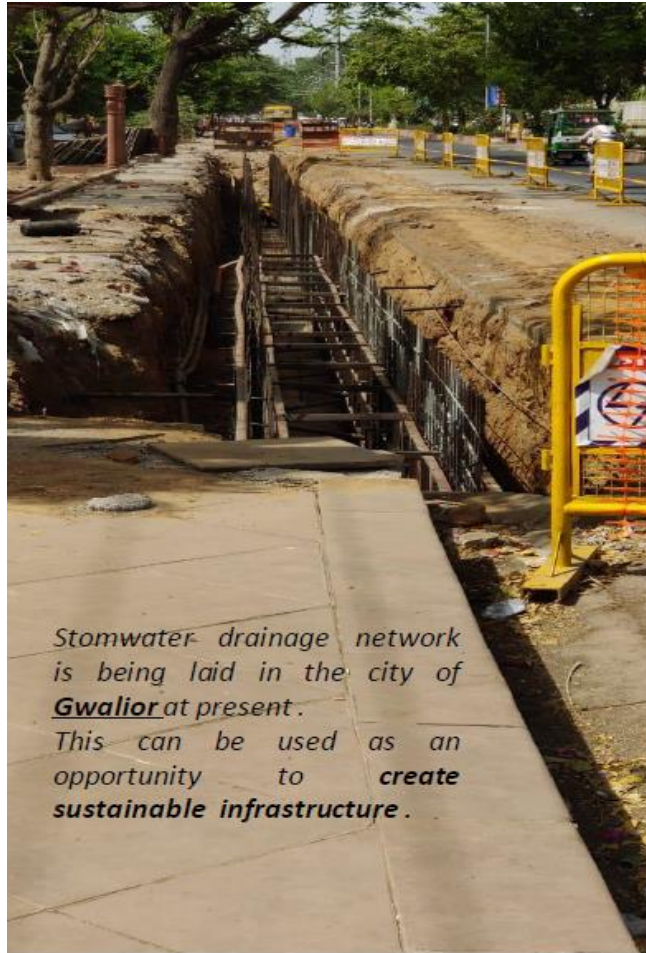
AMRUT 2.0
Urban Water
Security

Sub Scheme on
Local Area Planning
and Town Planning
Schemes

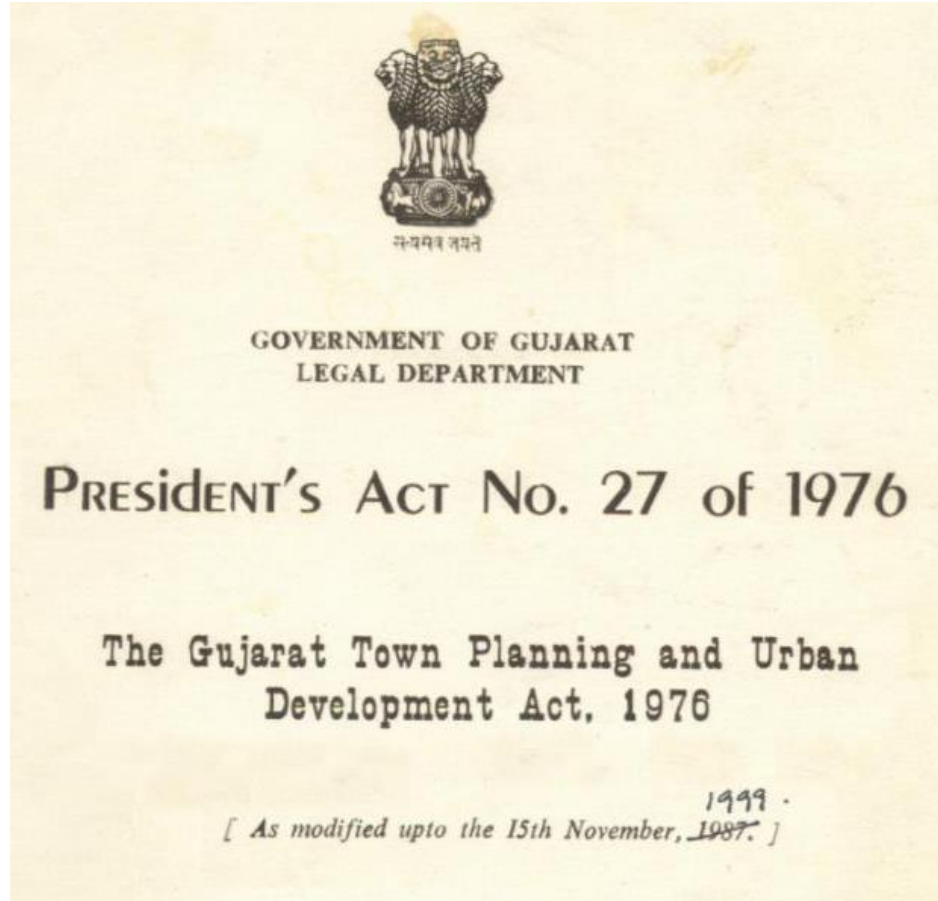
Climate Smart
Cities Assessment
Framework 2.0



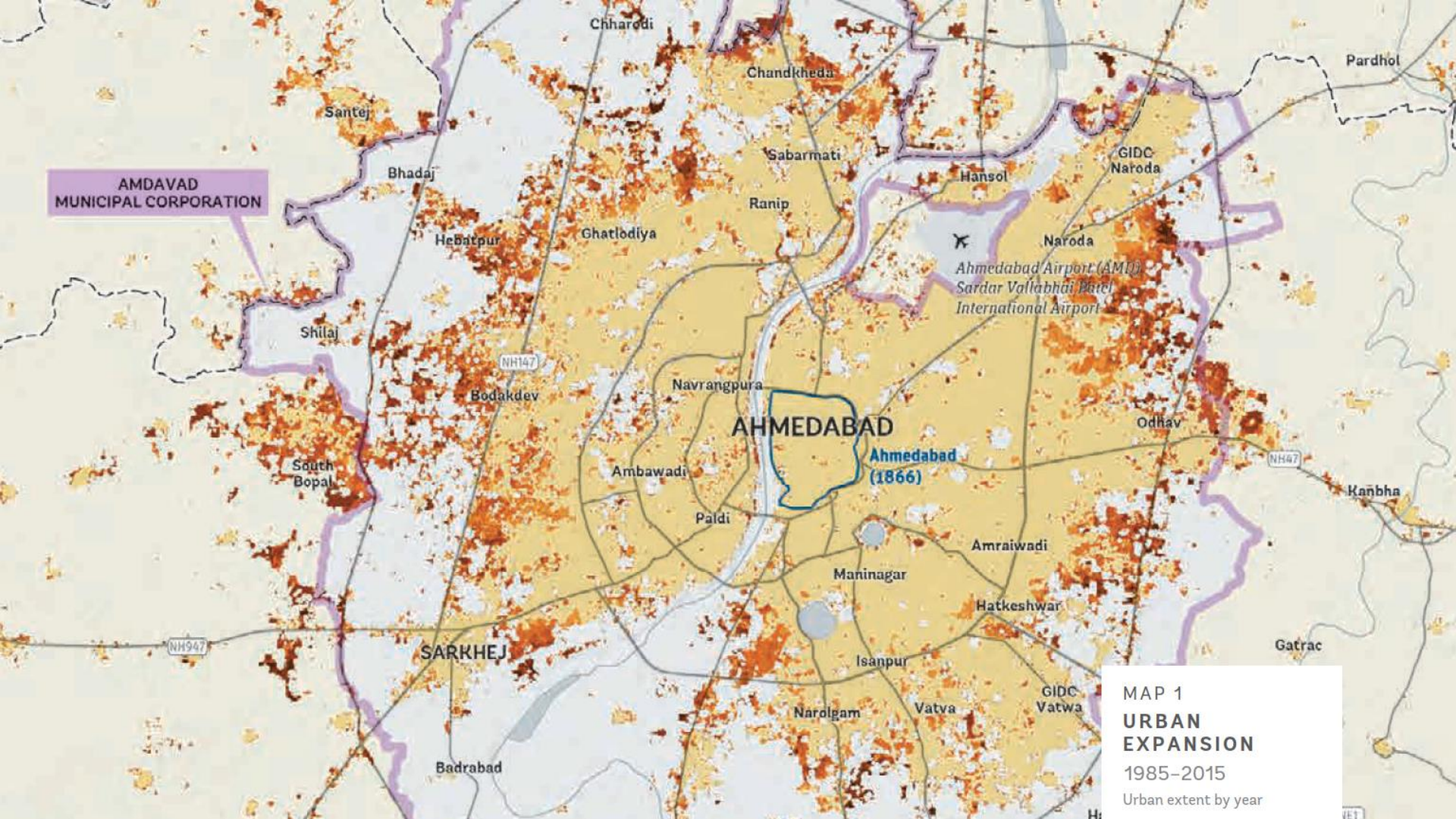




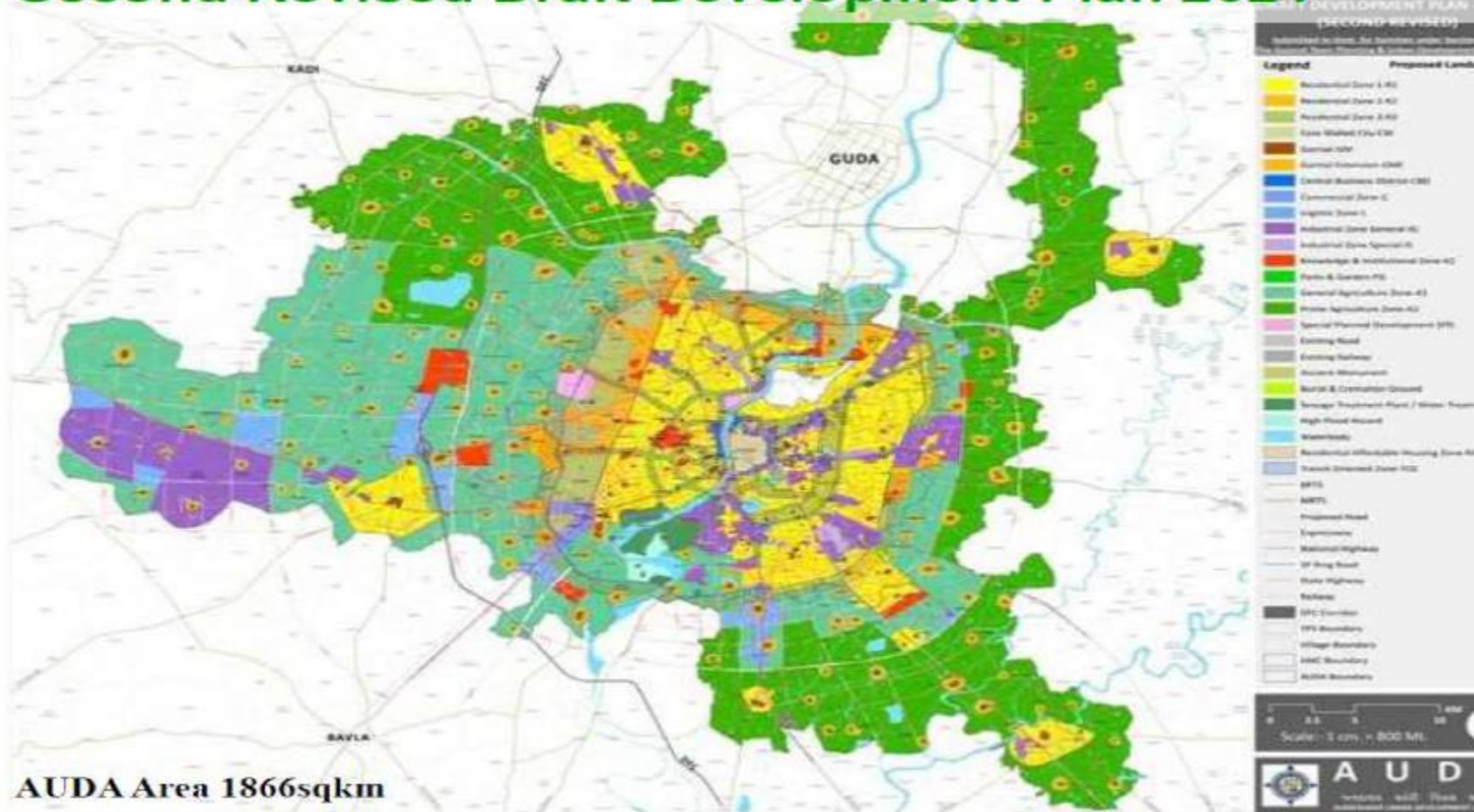
The Development Plan and Town Planning Mechanism in Gujarat



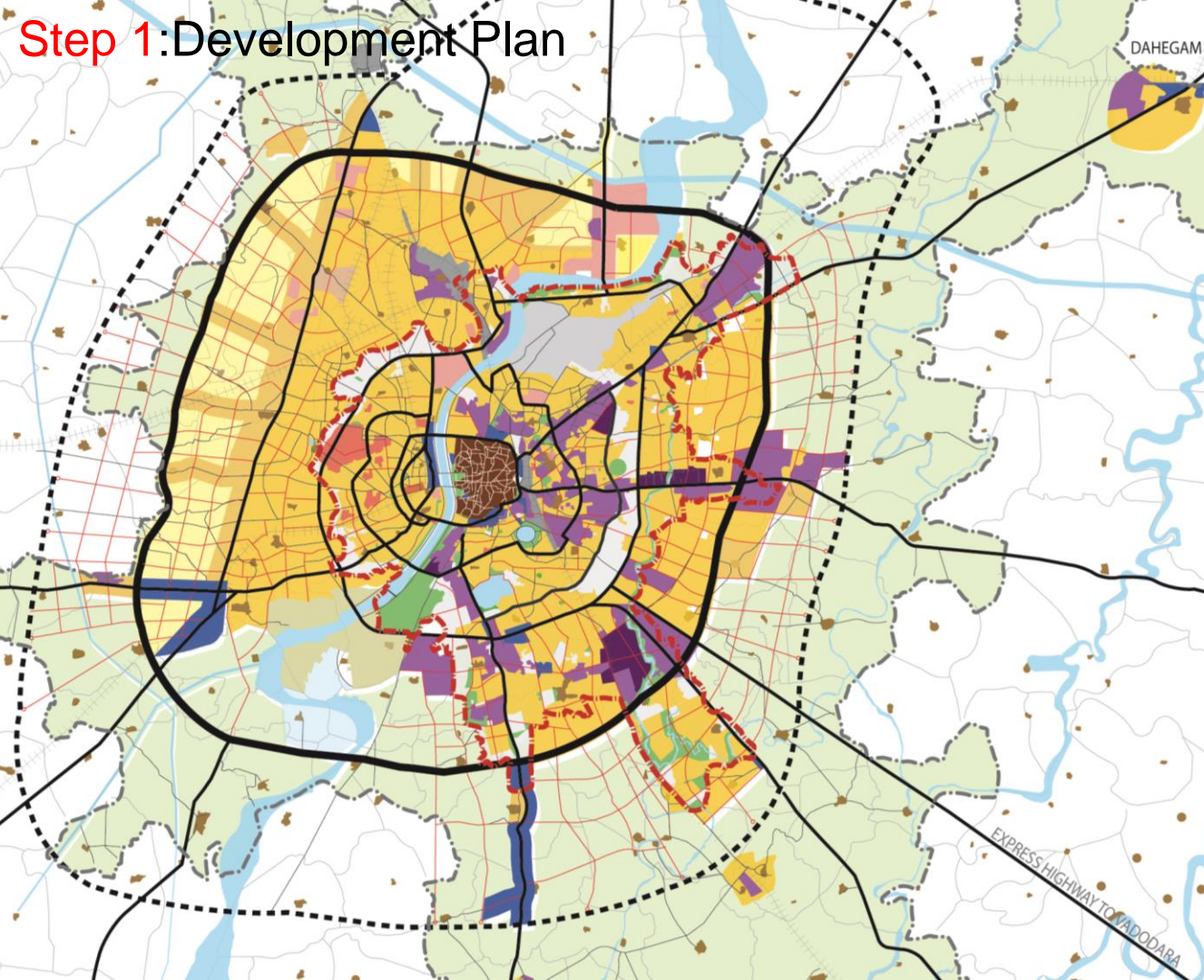
- The DP-TP mechanism is enshrined in the Gujarat Town Planning & Urban Development Act



Second Revised Draft Development Plan 2021

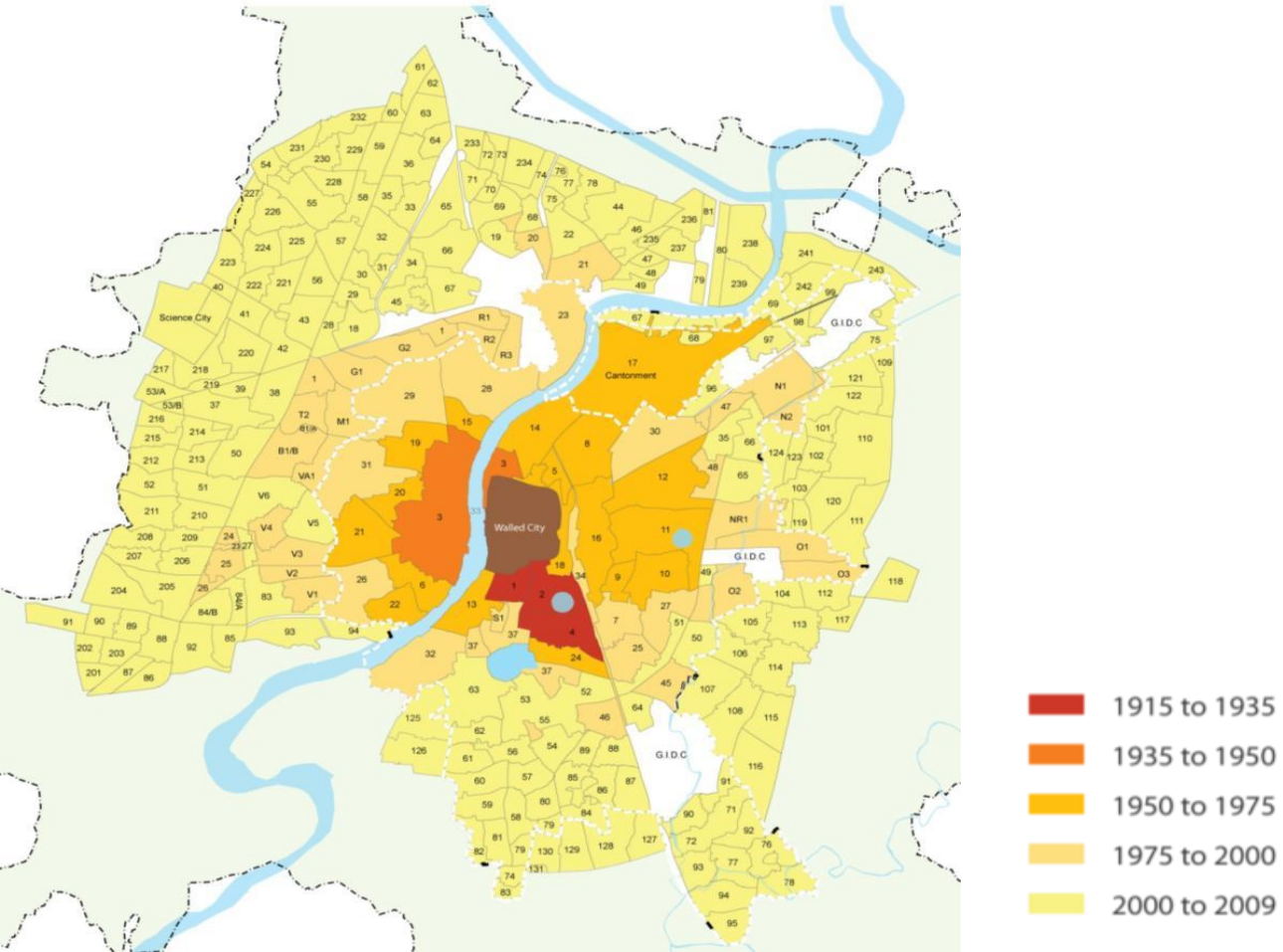


Step 1: Development Plan



- strategic city-wide plan
- new growth areas
- city level infrastructure
 - arterial roads
 - water
 - sewage

Ahmedabad 2001

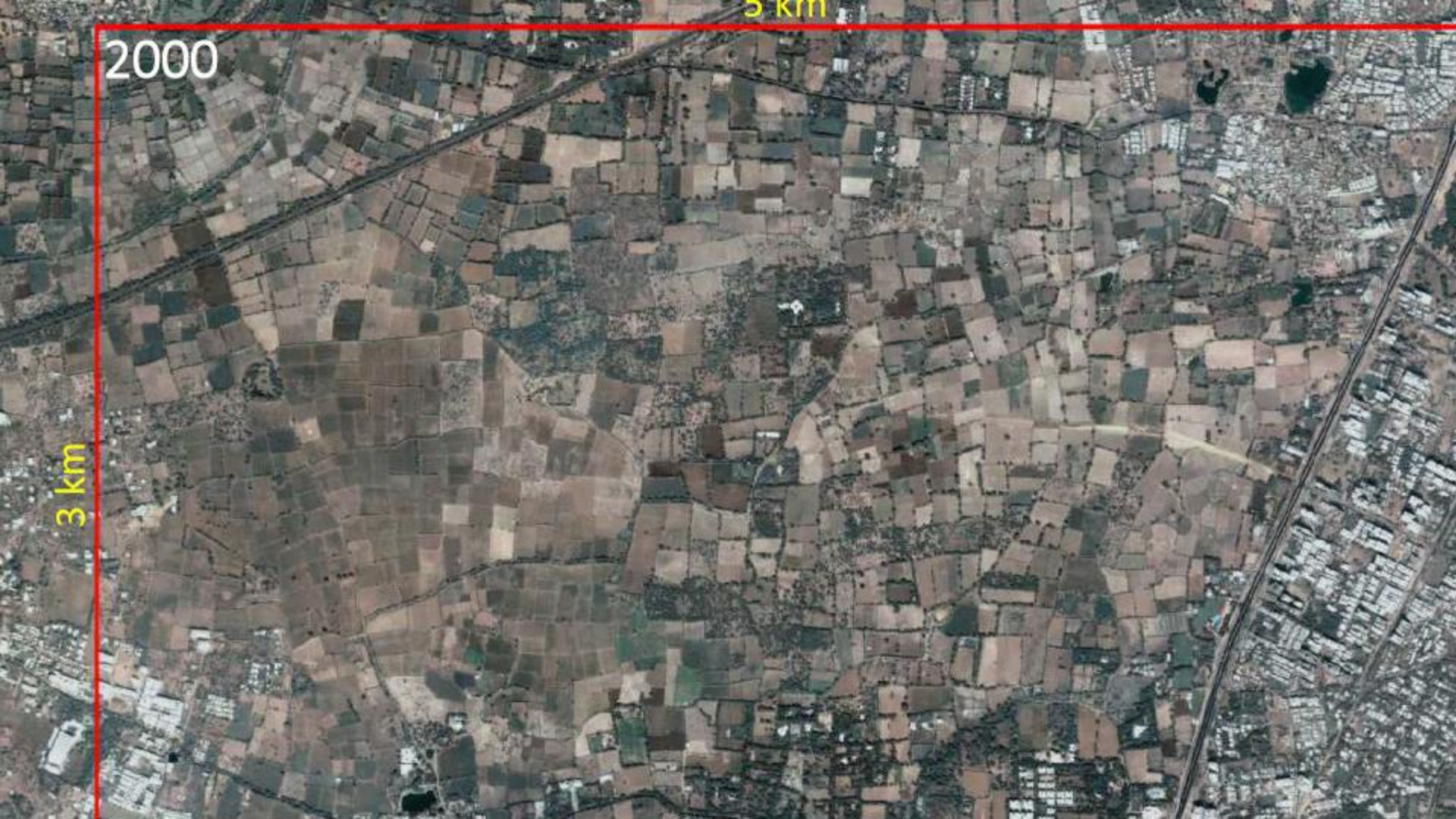


Urban growth has been managed effectively since many decades using the DP-TP mechanism

2000

5 km

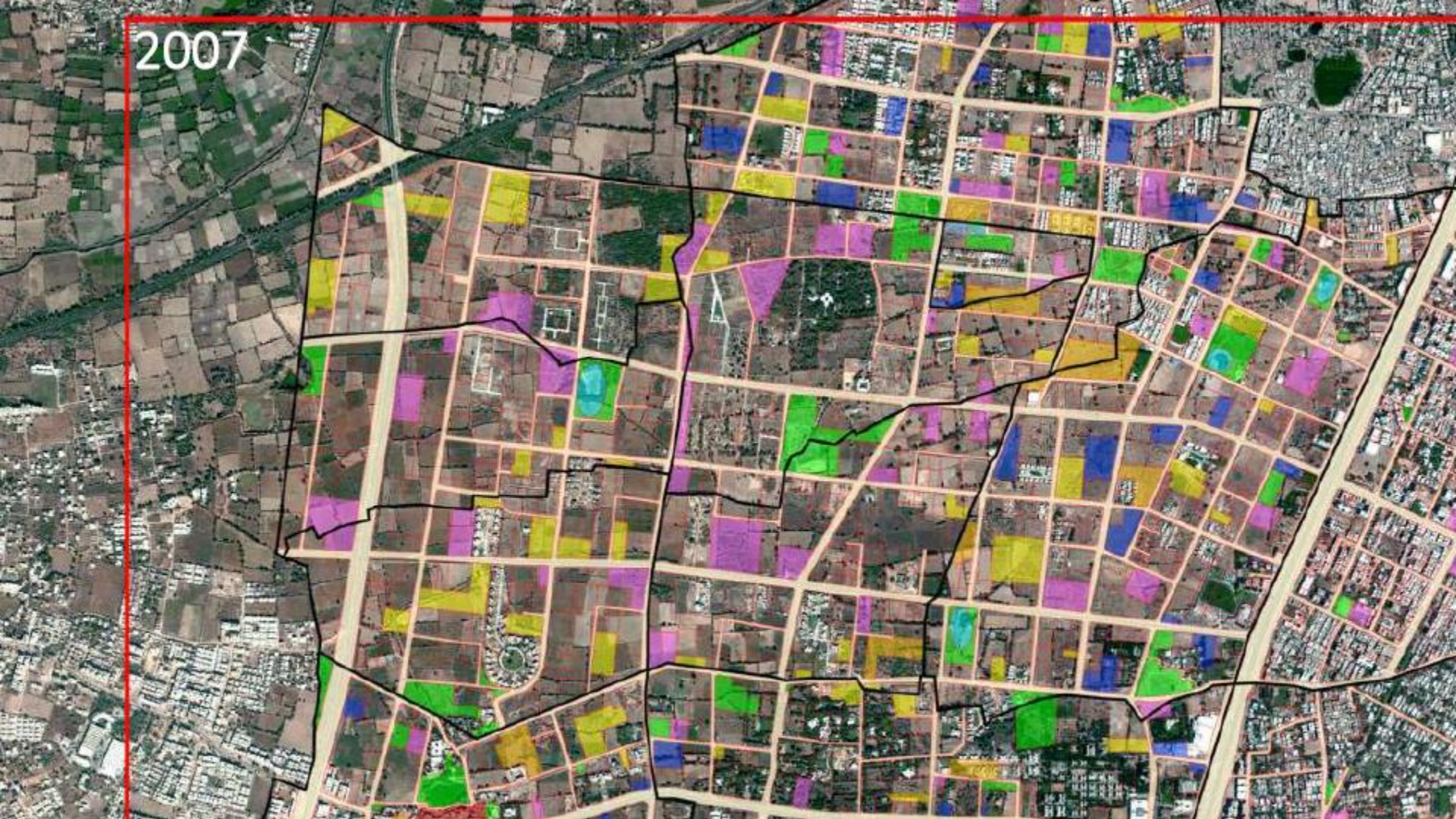
3 km



2001



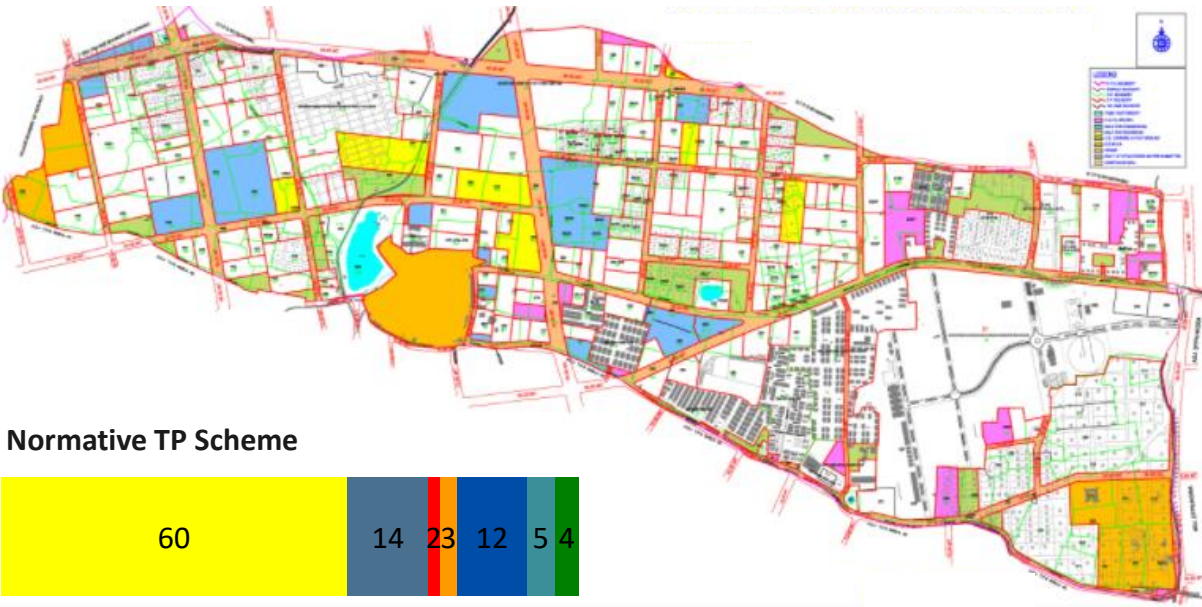
2007



Normative Town Planning Scheme

The TPS is a land pooling and readjustment mechanism that allows the city to appropriate land from private landowners for public purposes, such as roads, open spaces, low-income housing, underlying utility infrastructure, and other health, education, and community services.

Concept



- Residential
- Roads
- Social Amenities
- Social Housing
- Land for sale
- Public Utilities
- Green Spaces

Normative Town Planning Scheme

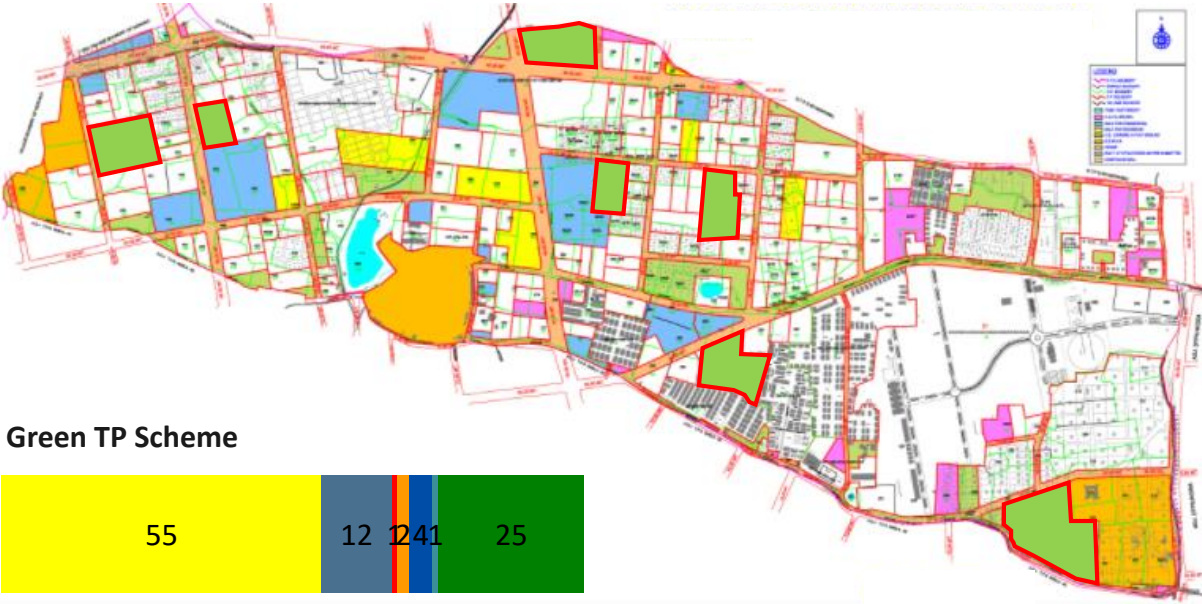
Green Town Planning Scheme

Appropriating more from private landowners for green spaces.

Reserving low lying areas for ponds or green spaces

Greening at building, street and neighborhood level

Concept



- Residential
- Roads
- Social Amenities
- Social Housing
- Land for sale
- Public Utilities
- Green Spaces

Sustainability Measures in Micro Level Planning

Building Level

Components that can be implemented atop or around buildings



Green
Roofing

Planted layer of shallow or deep green systems or gardens atop roof of buildings



Rainwater
Harvesting

Water collection and storage systems in all buildings

- Includes all the tools/ options/ innovative ideas that can be used to increase the green spaces and the infiltration capacity of TP Scheme.

- This toolkit organizes the components into typologies that correspond with the urban systems that can be improved.

- GREY + GREEN Infrastructure approach

Street Level

Components that delay stormwater and increase infiltration opportunities



Sidewalk
planters

Planter beds and tree pits on wide sidewalks – Greening the streets



Bioswale
channels

Landscape feature along avenue medians and other linear strips

Neighborhood Level

Interventions that can store water within urban public spaces



Constructed
ponds/
wetlands

Designed water bodies within parks and open spaces and low-lying areas



Parks and
Gardens

Landscape features within parks and open spaces with infiltration potential



Penetration wells
(Khambati kuva)

Landscape features within parks and open spaces with infiltration potential

An Opportunity to Build Back Better? AND Living Back Safer!

Email : [saswatb@cept.ac.in/](mailto:saswatb@cept.ac.in)
Mobile : 8128291880

