



BHOPAL

City Fact Sheet

SUSTAINABLE CITIES
INTEGRATED APPROACH PILOT (SCIAP)

APRIL 2021



UN HABITAT
FOR A BETTER URBAN FUTURE



Sustainable Cities: Integrated Approach Pilot
URBAN SUSTAINABILITY ASSESSMENT FRAMEWORK
City Fact Sheet - Bhopal

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Prepared for:



**Ministry of Housing
and Urban Affairs**
Government of India



Bhopal Municipal Corporation
नगर पालिक निगम, भोपाल

Project Donors:



Prepared by:

UN HABITAT
FOR A BETTER URBAN FUTURE

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About SCIAP and USAF

The Sustainable Cities Integrated Approach Pilot (SCIAP) project, funded by GEF-6, is being implemented by UNIDO and UN-Habitat, in partnership with the Ministry of Housing and Urban Affairs (MoHUA) of the Government of India in Bhopal, Guntur, Jaipur, Mysuru and Vijayawada. The main goal is to infuse sustainability strategies into urban planning and management at the city level and create an enabling climate for investments in green infrastructure that would reduce greenhouse gas emissions, improve service delivery and enhance the quality of living for all citizens, thereby building resilience and strengthening the governance capacity of the cities.










A major component of the project is to develop an Urban Sustainability Assessment Framework (USAF) for spatial planning in India which is designed as a decision support tool for municipal commissioners and urban practitioners to support sustainable and resilient urban planning and management of cities in India. Urban diagnostics based on USAF cover 12 sectors, namely, urban form-public space and safety, housing and property, water, sanitation, solid waste management, transportation, social facilities and services, environment and ecology, clean energy, disaster risk management, governance and data management and finance and economy. The performance of these sectors is measured using national and international benchmarks, further refined by consultations with the pilot cities. USAF 'spatializes' several indicators for granular planning and to identify inequalities in service delivery, resource allocation, accessibility of essential utilities, and recreational opportunities, among others, within a city.

Furthermore, giving emphasis to spatially-informed planning, USAF equips city managers to model area-based development strategies and assess their impact on improving sectoral performance against benchmarks. Area-based development strategies developed through USAF, when combined with a financing plan, lay the ground work for capital investment plans thereby providing a critical link between urban planning, finance and governance. It can also help decision-makers prioritize projects to effectively direct resources towards targeted areas for maximum impact and benefit.

About this Fact Sheet

This fact sheet showcases preliminary analyses that has emerged after applying the USAF to Bhopal. It highlights how the city fares across twelve USAF sectors on its primary indicators, draws attention to where the city functions well and aspects that need attention as per the benchmarks of the USAF. For detailed strategic diagnosis for Bhopal, please refer to the City Profile and Diagnostic Report.

Please note that the data reported for the cities is for the year 2018-19 (data sourced from SLB/MPI/EOLI/CSCAF/Swachh Survekshan/ Municipal Budget). Open source repositories from GHSL from European Commission, OpenStreetMap and USGS Landstat Imagery was used.

- USAF SECTORS**
-  **01 PUBLIC SPACE, SAFETY AND URBAN FORM**
 -  **02 HOUSING AND PROPERTY**
 -  **03 WATER SUPPLY**
 -  **04 SANITATION**
 -  **05 SOLID WASTE MANAGEMENT**
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Framework Scoring

Each scoring range is based on benchmarks derived from national standards and linked to global standards wherever possible. For quantitative indicators, indicator value over and above the set benchmark is categorised as excellent performance. The USAF has evolved from an initial 3-point to a 7-point scoring gradient. The range of 3-point scale (low-medium-high) has been used to interpolate and expand to a 7-point scoring scale (very low to excellent performance). The division of scoring range for continuous variables (or indicators) into seven defined breaks is based on equal intervals between the threshold and benchmark set for each indicator. On the other hand, indicators which are discrete or qualitative in nature are bifurcated only into three classes (very low – medium – excellent performance) and binary questions (yes/no) are classified as either very low or excellent. Indicators assessed on a 7-point scale result in a performance score which is less coarse in nature and better represents the continuum, making it more reliable than a narrower 3-point scale. Expanding the mid-range performance (lower medium to upper medium) especially, captures the variation better for average performance city values.

For representation, the range of performance follows a spectral colour ramp and varies from two shades of red (very low - low) to two shades of green (high - excellent) with three shades of yellow in between (lower medium - medium - upper medium).

Very Low	Low	Lower Medium	Medium	Upper Medium	High	Excellent
(0)	(1)	(2)	(3)	(4)	(5)	(6)

There are some indicators that are not included in the performance score of the city and are labelled as 'descriptive indicators' in the benchmark column. These indicators can either be quantitative (with specified formula to measure it) or qualitative (yes or no), but do not have a set benchmark for scoring. The information from these parameters along with few other benchmarked indicators would be helpful in formulating the profile of the city.

Indicators for which data is either currently awaited or is unavailable are denoted as '--' against the depicted indicator.

Descriptive Indicator	(--) Data awaited/unavailable
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The USAF serves primarily as a guide for orienting the priorities of a city and directing its resources to meet the desired vision and goals as outlined in its master plan. The conclusions of the framework thus point to the weak spots with respect to the city's sustainable development goals and efforts to build resilience. As part of SCIAP, following the City Profile and Diagnostic Report, a Sustainable City Strategy shall also be prepared which would serve as the spatial strategic plan for the city with key actions and interventions to achieve the its vision and goals.



BHOPAL

Bhopal is the administrative capital of the state of Madhya Pradesh and a major educational and institutional hub in the region. Bhopal is situated amidst Vindhya and Satpura mountain ranges along the Malwa Plateau. Strings of hillocks dot the undulating terrain of the city. The ridges are green, mostly protected under national/state institutions or developed as high-income housing. The city is nestled in an intricate lake system with valleys acting as watersheds with stormwater reservoirs, lakes, and streams. The Upper Lake, spread over 31 sq.km, is the major source of drinking water and irrigation and supports delicate wetland ecosystems in the region.



19.23 Lakhs
POPULATION



46 PPH
POPULATION DENSITY



417 SqKm
AREA

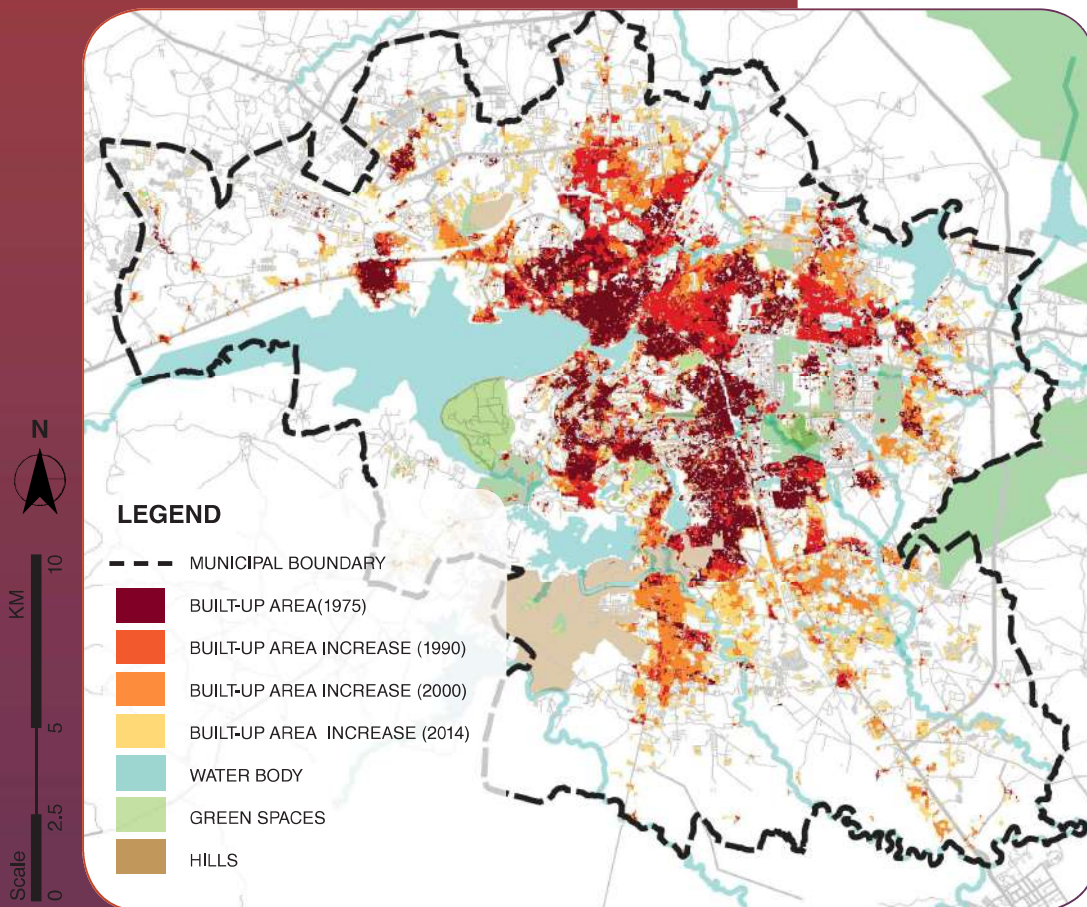


Figure 1.1: Multi-temporal classification of built-up presence (1975-2014)

In 2019, Bhopal's population was 19,23,879 persons with 4,37,000 households. Over an area of 417 sq.km, Bhopal is divided into 19 administrative zones headed by Zonal Officer or Zonal Commissioners. There are 85 wards, each represented by an elected councilor who serve on the city council, headed by the Mayor.

The city is progressing towards the southern and eastern parts owing to flatter terrain and proximity to Bhopal – Hoshangabad transport corridor (Figure 1). Development towards northern and western parts of the city is limited, due to the presence of vast extents of water bodies, wetlands, and undulating terrain. The old city is

the densest pocket with a density of 974 persons/hectare. The dense and narrow built form in the old city hinders the development towards the northern direction and the Bhopal Gas Tragedy in 1984 restricted the development towards Union Carbide Factory present in the northern part of the city. At present, the city does not have an approved planning document to guide development. Bhopal Development Plan 2005 (1999) which was prepared for area of 80 Sq km is the current statutory planning document.

Figure 2 shows the distribution of densities due to presence of natural features and undulating terrain.

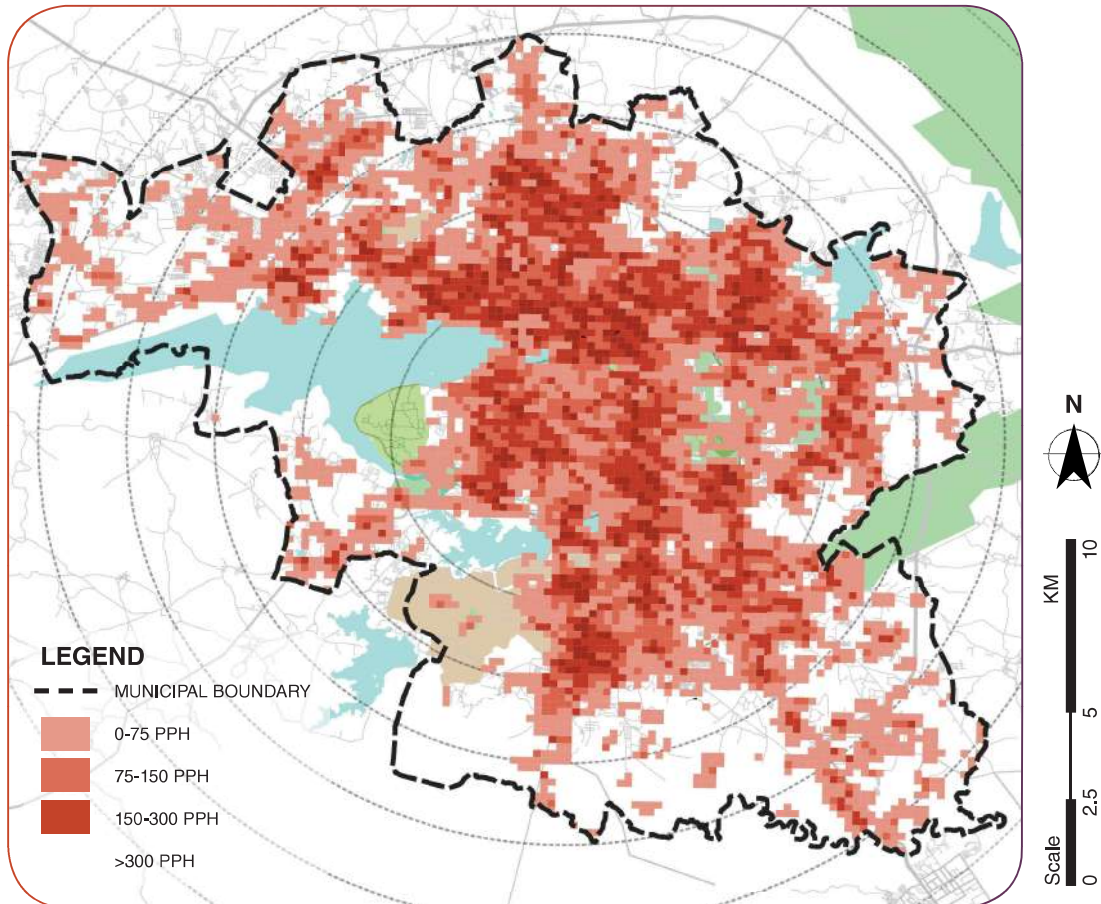


Figure 1.2: Residential population density estimates (2015)



01

PUBLIC SPACE, URBAN FORM & SAFETY



4.78 sqm
green area per capita



15% decrease
in built-up area per person
in last decade



35% population
has access to parks and
open spaces within a
walking distance of 800m



reduction
in agriculture land in
comparison to the last
revision of master plan



92% roads
have streetlights

30% urban land is non developable due to lakes, wetlands and urban forests. The dense old city has less green and open spaces.

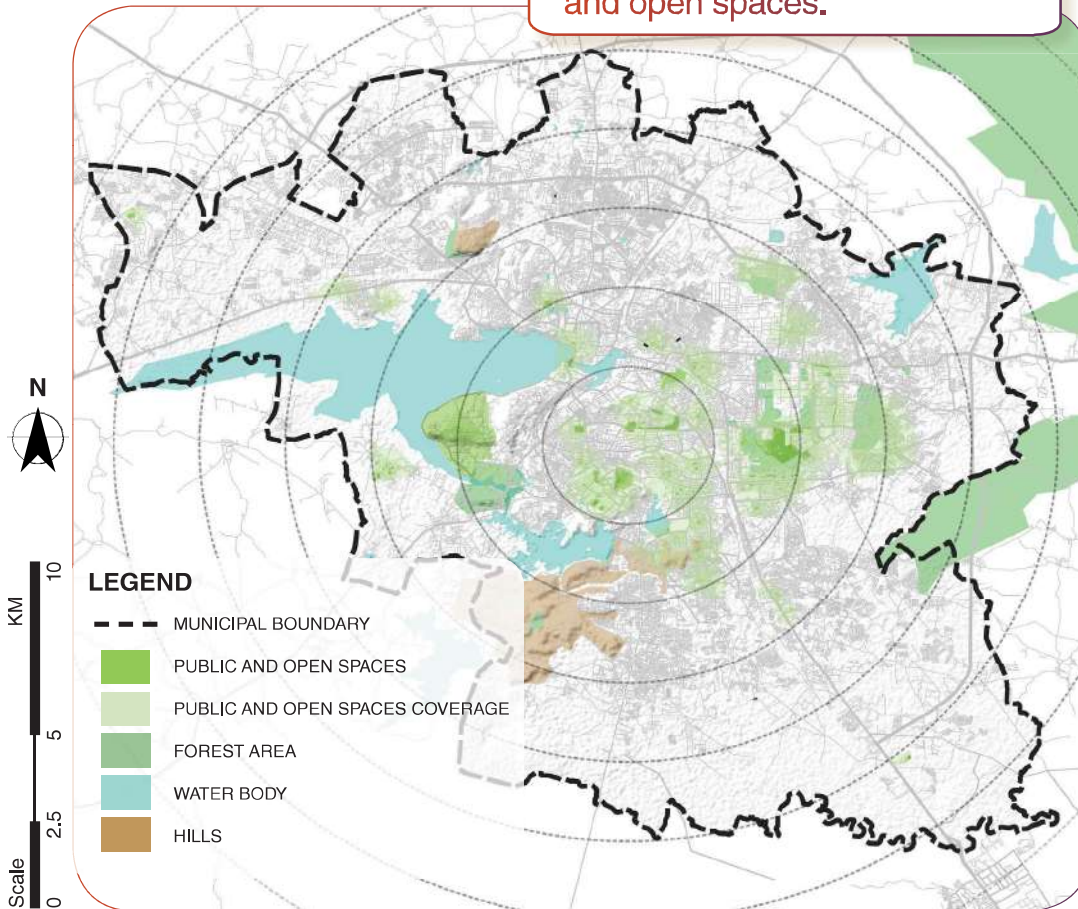
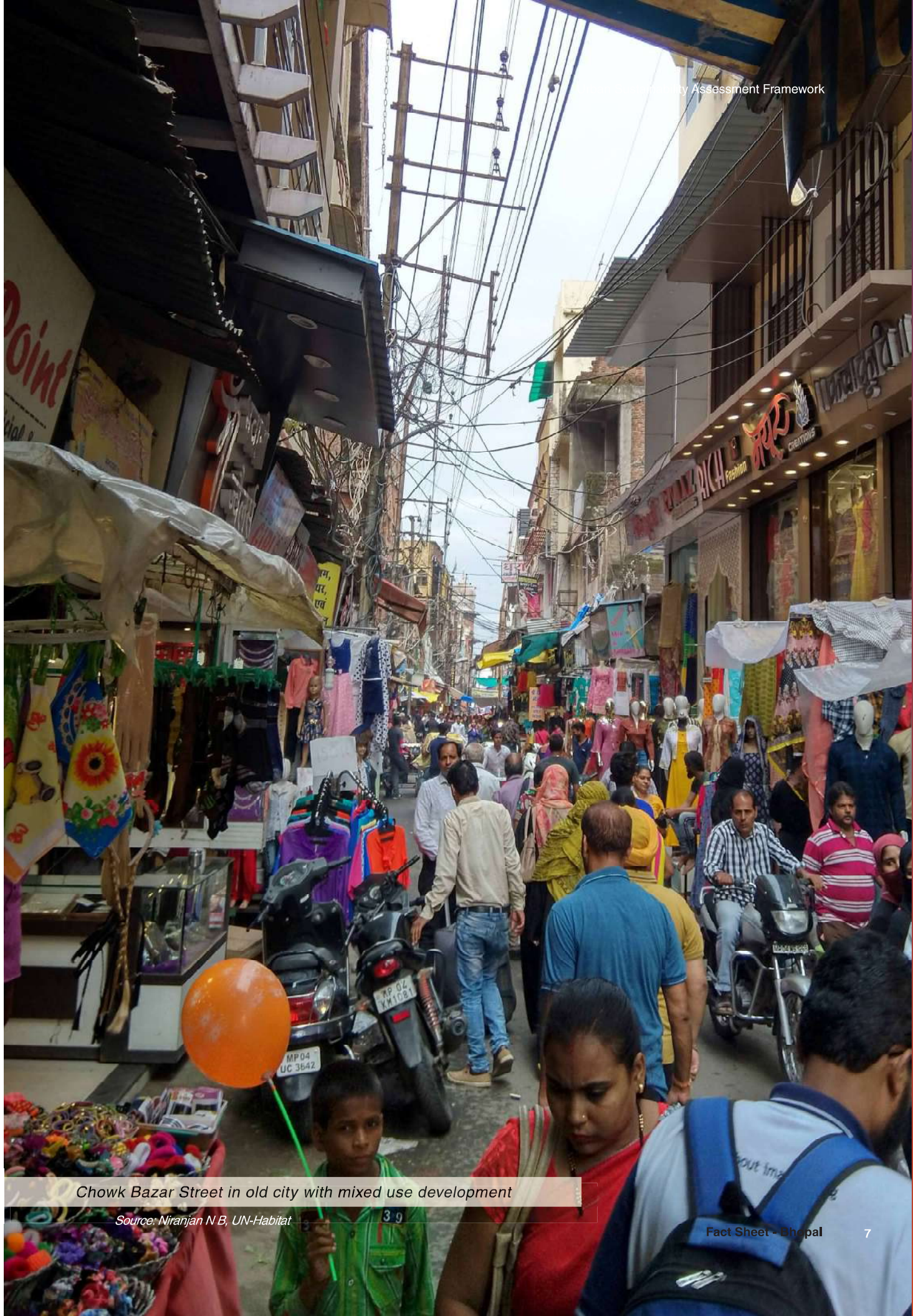


Figure 1.1: Population catchment with access to park, public and open spaces within a radius of 800m



Chowk Bazar Street in old city with mixed use development

Source: Niranjana N.B., UN-Habitat



02

HOUSING AND PROPERTY

36% households
living in slums



8% city area
falls under slums/
squatter settlements



25% of the population resides in slums. Bhopal accounts for 14% of total slum population residing in the state.



Dhamkheda A Sector slum settlement along Kaliasot River

Source: Manjari N B, UN-Habitat

03



WATER SUPPLY



94% households have piped water supply connection



No water resource assessment and management



97% water samples comply with national potable water quality standards



83% extent of non-revenue water

BMC supplies around 230 lpcd water sourcing from Upper Lake, Kolar Dam & Narmada River. High NRW due to low extent of metering in the city

04



SANITATION



25% sewerage connectivity



98% households have access to toilet facilities



36% treated before discharge to surface water bodies



8% recycled water is used



93% wastewater samples passed the specified secondary treatment standards from the total samples collected in a year

Bhopal has hybrid sanitation system with > 40% households have onsite facilities. No FSSM facility is present or proposed.



05

SOLID WASTE MANAGEMENT

95% dry waste separated and classified for recycling/material recovery



74% wet waste collected is processed in compost plant



27% total waste disposed off in open dumps / control dumps, water bodies / is burnt



0% solid waste used for energy recovery (incineration)



City Waste Management Rules 2018 govern Bhopal's waste management operations.

200 TPD wet waste facility is inaugurated and 10 TPD C&D Plant under is in pipeline.

Greater than **50%** of landfills undergoing remediation/remediated scientifically



Bhanpur waste remediation site

Source: SBM Cell, BMC



TRANSPORTATION



55% population has access to public transportation within 500m



54% road length have footpaths with width more than 1.2 m



-- % increase/decrease public transport ridership



1.66 km cycle track per 1,00,000 population



6.0 km/sqkm road density



-- % shared vehicles running on clean technology

Bhopal has BRTS, and Metro is under construction. Magic Auto, a private service, is a major mode of IPT. Under AMRUT 300 electric buses has been approved.

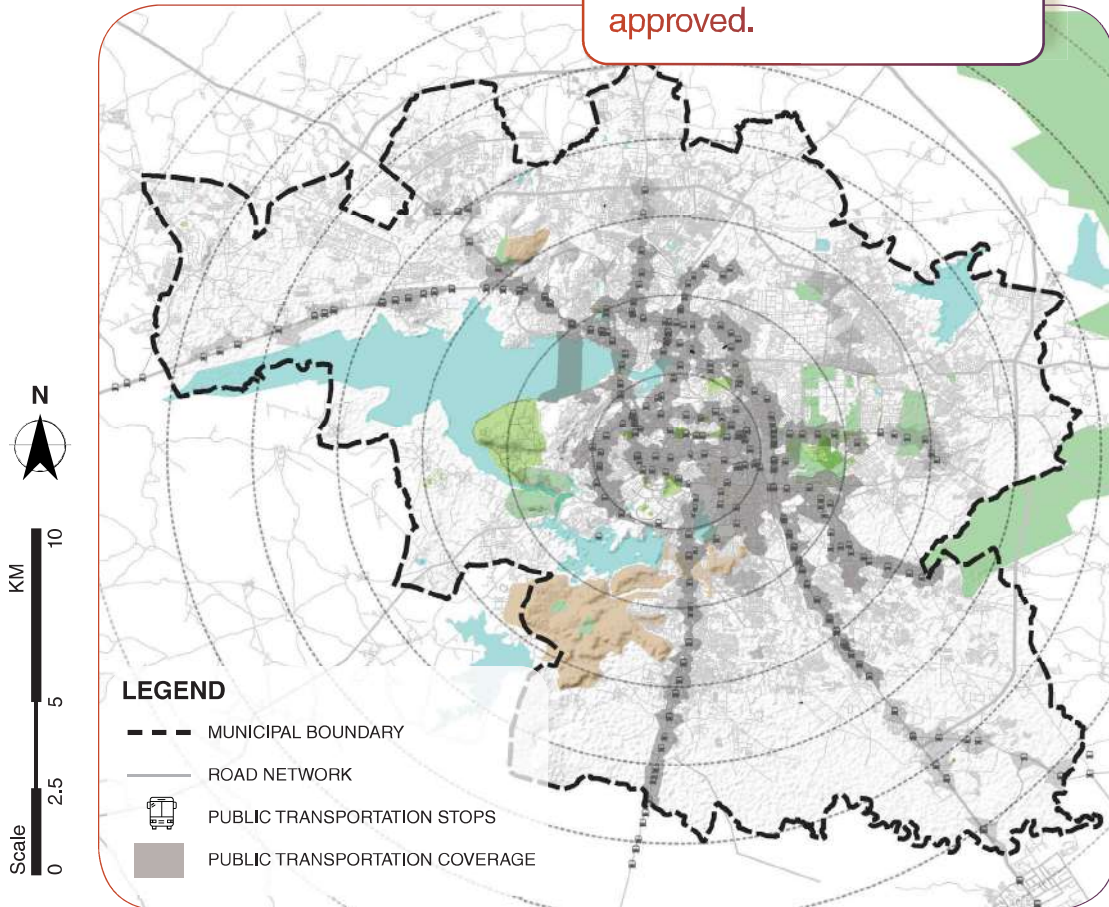


Figure 1.2: Population catchment with access to public transportation within a radius of 500m



Public cycle sharing docking station at Boat Club, Upper Lake

Source: Niranjan N B, UN-Habitat



SOCIAL FACILITIES AND SERVICES

 **82%** population has access to healthcare services

 **92%** population has access to primary and secondary schools

 **79%** female literacy rate

 **-- %** reduction in BPL cards

Despite Bhopal being a regional educational and healthcare hub, the existing infrastructure needs augmentation to improve its reach.

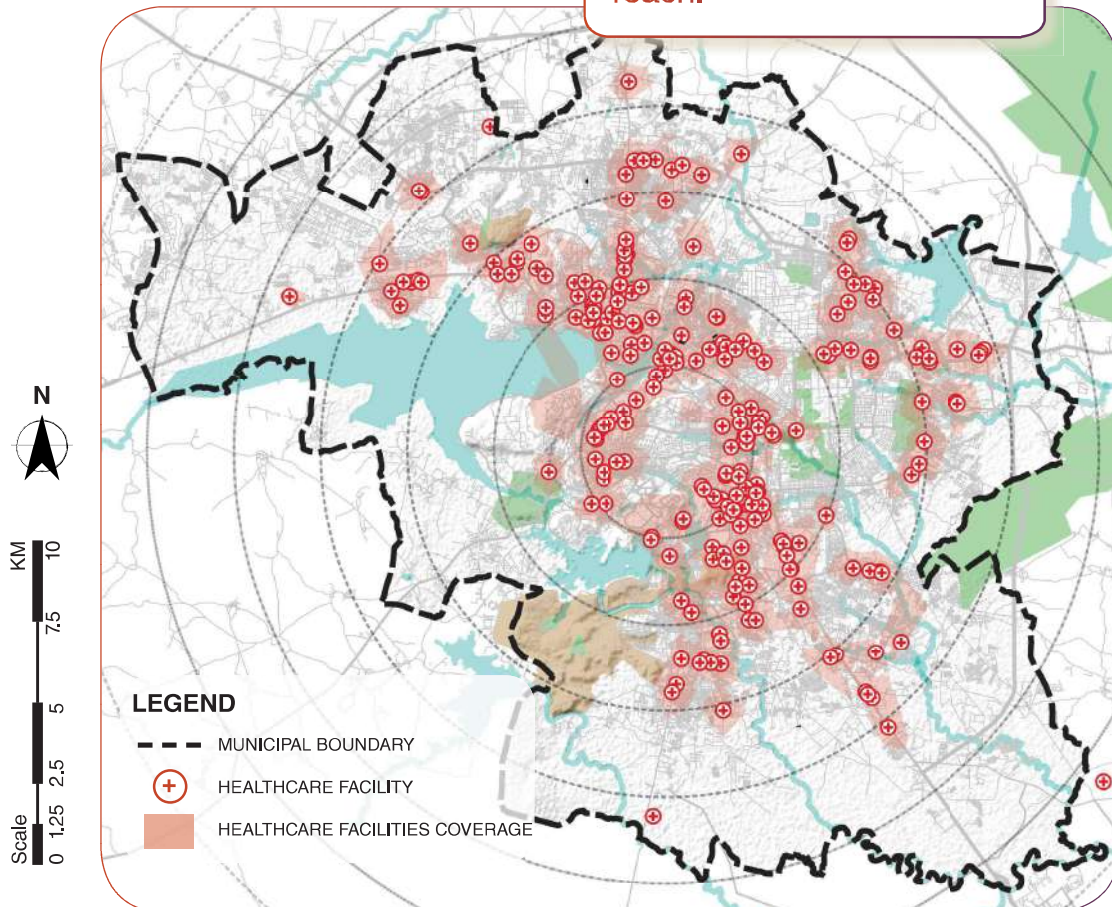


Figure 1.3: Population catchment with access to healthcare facilities within a radius of 800m



08

ENVIRONMENT AND ECOLOGY



Presence of
Clean Air Action Plan



-- days
above mean AQI level



No
GHG emission monitoring system



-- %
tree canopy cover



No
local biodiversity strategy and action plan



No incentives
for Green Buildings



36,60,161
MtCO₂e/capita
annual (GHG) emissions

The total emissions (including CO₂, CH₄, and N₂O) added to 36,60,161 Mt CO₂eq. The City Climate Action Plan for Bhopal is under development



09

CLEAN ENERGY



-- % households
with authorized connection to LPG for cooking



-- % households
have access to renewable energy



-- %
renewable energy share in total energy consumption



-- kWh /capita
energy use in a year



16% streetlights
are energy efficient

The stationary energy sector/energy use emitted 20,49,250Mt of CO₂ eq., accounting for 56% of the total GHG emissions.

10



DISASTER RISK MANAGEMENT

Yes

Disaster Management Plan at city level



Not Prepared

hazard vulnerability maps/ risk maps (at city level)



As per state hazard vulnerability mapping Bhopal is classified as low vulnerability district. District level vulnerability maps have been prepared.

-- % households at risk due to placement in areas of non-mitigable risk



-- % buildings have access to emergency fire services within a distance of 4km



Tiger movement corridor along Kaliasot-Kerwa Ridge

Source: Niranjan N B, UN-Habitat



11

GOVERNANCE AND DATA MANAGEMENT



16 functions being implemented by ULB



12 services managed through a command and control centre



0.11 planners for every 14,000 population



Absence of GIS database-based master plan for the city



15 years since the master plan was last updated

The statutory master plan for Bhopal was prepared in 1999 for 80 sqkm urban area.

Bhopal Municipal Council has 41 women councillors with 48% representation.



Integrated Command and Control Centre in BSCDCL Office, Govindpura

Source: Nirajati N.R. UN-Habitat

12 

FINANCE AND ECONOMY

 **64%**
property tax collection efficiency

 **---** /capita
GDP of the city

 **'AA'**
Credit Rating

 **25% grants**
received from central & state governments to total revenue

BMC has initiated online tax collection and incentive scheme for early payment to improve tax collection. Since past four years, own source revenue is > 20% of total revenue, indicating good financial health

