



MAHILA HOUSING TRUST

Towards Responsible Urban Development



Jalgaon City
Municipal Corporation

JALGAON

CLIMATE ACTION PLAN





Acknowledgements

This Climate Action Plan has been co-developed by Mahila Housing Trust (MHT) with the support and collaboration of the Jalgaon City Municipal Corporation (JCMC). Deep appreciation is extended to the JCMC team, the city-level committee, and all government departments and institutional stakeholders who contributed their time, guidance, data, and technical inputs to the preparation of this plan.

Sincere thanks are also due to the women's groups, community leaders, and residents from Jalgaon's informal settlements whose lived experiences, participation, and local knowledge helped ground this plan in on-the-ground realities. Their insights have been central to shaping a Climate Action Plan that is both inclusive and responsive to the needs of vulnerable communities.

The support of the Maharashtra State Climate Action Cell and the Government of Maharashtra is gratefully acknowledged for providing the broader institutional and policy framework within which this plan has been developed.

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Pledge for Climate Action



Shri Gulabrao Patil

Cabinet Minister for Water Supply and Sanitation,
Government of Maharashtra
Guardian Minister, Jalgaon District

Jalgaon's climate challenge shows up first as water stress: erratic rainfall, falling groundwater, and the pressure this places on households that already struggle with supply.

In many of Jalgaon's wards, water security is still measured in tanker schedules and borewell depth, not in taps that run reliably through the summer. It is women, most often, who absorb the daily cost of that uncertainty, walking further and waiting longer as sources run dry. A Plan that puts water at its centre is a Plan that starts from where the burden actually falls.

The Jalgaon Climate Action Plan treats water security as a foundation, not an afterthought. It sets out how the city can secure its water future while building resilience in sanitation, infrastructure, and public health. That sequencing matters. A city cannot plan for heat, flooding, or growth without first securing its water.

This Plan makes that coordination easier rather than harder. It gives water supply, sanitation, health, and disaster response a shared reference point, so that departments that have historically planned in isolation now have reason to plan together.

Jalgaon has grown into a commercial and agricultural hub for North Maharashtra. That growth now has to be matched with the discipline to protect the resources it depends on. This Plan gives the city that discipline, and it does so in a way that respects how tightly water, sanitation, and public health are bound together in a city of this size.

The department will continue to support Jalgaon's water and sanitation infrastructure as this Plan moves into implementation, alongside the state's broader push to strengthen supply networks and treatment capacity across Maharashtra's districts. Thanks are due to the Jalgaon City Municipal Corporation, Mahila Housing Trust, and everyone who shaped this document, with every expectation that its water security measures will take hold on the ground and set a standard for the district as a whole.



Shri Girish Mahajan

Minister for Water Resources and Disaster Management
Government of Maharashtra

The Water Resources and Disaster Management portfolio sits at the intersection of two of this Plan's central concerns: managing water resources and preparing for disaster. Jalgaon's exposure to heat waves, erratic rainfall, and localised flooding is not hypothetical. It is already shaping how the city functions, and it will only intensify as rainfall patterns continue to shift.

The pattern this district faces is not simply less water or more water, but both, arriving unpredictably. Dry spells that stretch longer than they used to, followed by short, intense bursts of rain that the city's drains were never built to carry. That volatility is harder to plan for than a steady trend in either direction, and it is exactly the kind of risk this Plan has been built to anticipate.

What stands out in this Plan is that it does not treat disaster preparedness as a standalone chapter. It threads risk reduction through water management, infrastructure planning, and public health, so that resilience becomes a property of the whole system rather than a single department's task. That systemic view is often missing from city-level plans, and its presence here is a credit to the process behind the document.

Maharashtra has invested in early warning systems, coordinated response protocols, and disaster response funds designed to move quickly once a risk is identified. Jalgaon now has a plan that can plug directly into that state architecture rather than working in isolation from it, which should make coordination during actual emergencies, and the mock drills that precede them, far more effective.

Maharashtra has been building its disaster management capacity steadily, and this Plan gives Jalgaon a clear entry point into that capacity rather than leaving the city to build its own systems from scratch. That kind of alignment between city and state planning is worth more in a crisis than any single new piece of infrastructure.

Congratulations are due to the Municipal Corporation, Mahila Housing Trust, and the technical teams behind this work. A plan is only as good as its execution, and this one is built to be executed, not shelved.



Smt. Smitatai Wagh

Member of Parliament, Jalgaon

Representing Jalgaon in Parliament means carrying the concerns of this constituency to the national stage, and increasingly, those concerns include climate change. This Plan addresses climatic concerns of this constituency without losing sight of the everyday realities that come with each.

Jalgaon's identity as the banana capital of Maharashtra and a major cotton-growing district is not separate from its climate story. Shifting rainfall and rising temperatures touch farm incomes as directly as they touch city infrastructure, and a constituency built on agriculture cannot treat urban climate planning and rural livelihoods as unrelated concerns.

Jalgaon's resilience has consequences for the towns and villages around it. This Plan's insistence on placing women at the centre of its solutions reflects something seen first-hand in constituency work across Jalgaon. A Plan built with their participation, not just their consultation, is a stronger plan.

The Government of India has placed sustainable urban development and climate resilience at the centre of several national programmes. Continued effort to connect Jalgaon to that support will help ensure this Plan is backed by resources, not just intent, and that its recommendations do not stall for lack of funding once the initial momentum fades.

Thanks are due to the Jalgaon City Municipal Corporation, Mahila Housing Trust, and every stakeholder who gave their time to this process, particularly the women and community leaders whose experience shaped it. Jalgaon can be an example for other mid-sized cities in the region.



Shri Nandkishor Mahajan

Member of Legislative Council, Jalgaon

Legislative work on urban development often deals in policy and budget lines. This Plan gives that work a concrete shape for Jalgaon: specific sectors, specific risks, and a sequence for addressing them, laid out clearly enough that budgetary discussions can engage with it directly rather than in the abstract.

Jalgaon's growth has outpaced some of its urban systems. Water management, green infrastructure, energy efficiency, and mobility all need to catch up with a city that has expanded faster than its planning cycles. This Plan reads that gap correctly and proposes a way to close it, drawing on scientific assessment as well as what residents already know from living here.

The Legislative Council's role goes beyond approving new spending; it includes holding that spending to account. A plan this specific makes that accountability possible. Engagement with the Municipal Corporation and Mahila Housing Trust through this process reflects the effort that went into grounding the recommendations in Jalgaon's actual conditions rather than importing a generic template. That is the right approach for a city at this stage of growth, and one that should make the Plan easier to defend when resources are being allocated.

Continued support for the legislative and budgetary steps this Plan will need can be expected in the Council. Congratulations to everyone who contributed to it.



Shri Suresh Damu Bhole (Raju Mama)

Member of Legislative Assembly, Jalgaon City

Jalgaon city is an important urban centre in North Maharashtra, and it is clearly evident that, due to growing urbanisation and the effects of climate change, the city's temperature is rising steadily. Against this backdrop, the detailed study report prepared for Jalgaon city by Mahila Housing Trust (Towards Responsible Urban Development) is highly commendable and far-sighted.

This report presents an in-depth study of the city's rising temperature and suggests sustainable, environment-friendly measures with a vision extending up to the year 2070. The measures set out in this report are highly useful and necessary for a rapidly developing city like Jalgaon.

Given the impact that rising temperatures are having on citizens' health today, implementing such long-term, planned initiatives is the need of the hour. It can certainly be said that this report marks an important step towards making Jalgaon a "Climate Resilient City."

Heartfelt congratulations to the institution for this initiative, along with the hope that the recommendations in this report will be put into practice, moving Jalgaon towards becoming an environment-friendly, sustainable, and healthy city.



Smt. Deepmalatai Kale

Mayor, Jalgaon City

Jalgaon city is an important urban centre in Maharashtra. Various surveys and government data clearly show that, due to growing urbanisation and the worrying effects of climate change, the city's temperature is rising steadily. Against this backdrop, the detailed study report prepared for Jalgaon by Mahila Housing Trust is highly commendable and far-sighted.

This report suggests many remedial measures and explains the causes behind the rising temperature. The effort that has gone into this study is commendable, and it is hoped that it will lead the city to take the positive steps needed on this issue.

Long-term, planned implementation is the need of the hour to address rising temperatures, and this report will help Jalgaon bring its temperature down. Heartfelt congratulations are due to the institution for this initiative, along with the hope that its recommendations are translated into action, moving Jalgaon towards becoming an environment-friendly, sustainable, and healthy city.



Shri Rohan Ghuge, IAS

District Collector, Jalgaon

Resilient cities are built through informed planning, strong institutions, and collective action. As climate-related challenges become more frequent, integrating resilience into governance is no longer optional—it is essential. The Jalgaon City Climate Action Plan marks an important step towards embedding climate resilience into urban development while contributing to the broader vision of a climate-resilient Jalgaon district.

Jalgaon city, the administrative and economic centre of the district, plays a vital role in the region's growth. However, rising temperatures, recurring heat waves, water stress, erratic rainfall, and localized flooding are increasingly affecting the city's infrastructure, public health, and livelihoods, with implications across the district. Addressing these challenges requires coordinated planning that strengthens resilience at both the city and district levels.

The Jalgaon City Climate Action Plan provides a practical and evidence-based framework for action across key sectors, including urban planning, water resource management, green infrastructure, sustainable mobility, renewable energy, public health, and disaster risk reduction. Its implementation will not only enhance the city's resilience but also contribute to the sustainable development of the district.

I appreciate the efforts of the Jalgaon City Municipal Corporation, Mahila Housing Trust (MHT), technical experts, government departments, academic institutions, and all stakeholders who have contributed to the preparation of this Plan. Their collaboration reflects the importance of partnerships in building resilient and sustainable communities.

The District Administration remains committed to strengthening climate resilience through coordinated governance, institutional convergence, and disaster preparedness. I am confident that this Plan will guide informed decision-making and effective implementation, enabling Jalgaon to emerge as a model district for climate-responsive urban development in Maharashtra.

I extend my best wishes for the successful implementation of this Plan and encourage all stakeholders to work together in building a greener, healthier, and more resilient Jalgaon district for present and future generations.



Shri Aditya Jiwane, IAS

Municipal Commissioner, JCMC

It gives me immense pleasure to present the Jalgaon Climate Action Plan (CAP), a significant milestone in the city's journey towards sustainable, resilient, and climate-responsive urban development. As cities across the world face the growing impacts of climate change, it is imperative that local governments take proactive measures to safeguard communities, strengthen infrastructure, and ensure sustainable growth. This Climate Action Plan reflects Jalgaon City Municipal Corporation's commitment to addressing these challenges through informed planning, collaborative action, and long-term vision.

The preparation of the Jalgaon Climate Action Plan has been guided by a scientific, evidence-based, and participatory approach. Through extensive consultations with government departments, technical experts, academic institutions, civil society organizations, and community representatives, we have identified Jalgaon's key climate risks, greenhouse gas emission sources, and priority areas for intervention. The Plan provides a comprehensive roadmap that integrates climate mitigation and adaptation strategies across sectors including urban planning, water resources, energy, mobility, solid waste management, biodiversity, and public health.

This Plan emphasizes the importance of community participation, particularly the leadership of women and vulnerable communities, in shaping solutions that are locally relevant, equitable, and sustainable. By combining technical expertise with community knowledge, the Jalgaon CAP lays a strong foundation for building a city that is better prepared for future climate uncertainties while improving the quality of life for all its citizens.

I sincerely appreciate the efforts of the Mahila Housing Trust (MHT), our technical partner, for their valuable support in preparing this Climate Action Plan. I also extend my gratitude to all municipal departments, government agencies, technical institutions, development partners, elected representatives, and community members whose active participation and unwavering commitment have made this Plan possible. Their collective contributions have ensured that the recommendations presented are practical, evidence-based, and aligned with Jalgaon's development priorities.

The successful implementation of the Jalgaon Climate Action Plan will require continued collaboration among all stakeholders. I encourage every citizen, institution, and partner organization to join us in translating this vision into meaningful action and creating a safer, greener, and more resilient future for generations to come.



Smt. Aloka Majumdar

Global Head of Philanthropy and Head of Sustainability,
HSBC India

Jalgaon is increasingly feeling the combined impacts of rapid urbanisation and climate change. Rising temperatures, growing environmental stress, and heightened climate-related vulnerabilities are placing additional pressure on the city's infrastructure, ecosystems, and communities. In this context, the launch of the Climate Action Plan for Jalgaon marks an important milestone in the city's journey towards becoming more sustainable, resilient, and future-ready.

At HSBC India, we recognise that sustainable urban development is fundamental to advancing inclusive growth and improving quality of life for communities. We are pleased to partner with MHT on this initiative, which represents a robust and future-focused approach to addressing climate-related risks in urban settings.

This programme is anchored in rigorous research, guided by evidence-based insights, and reinforced through coordinated collaboration across a broad range of stakeholders. By bringing together complementary capabilities and perspectives, the partnership is designed to support practical, scalable solutions that can deliver meaningful outcomes over the long term.

This collaboration is especially important given MHT's deep expertise and proven experience in this field, which will be instrumental in shaping and strengthening the initiative's impact.

The Climate Action Plan provides a clear assessment of Jalgaon's priority environmental risks and outlines practical, long-term, and community-centred measures to address them. Its recommendations are designed to strengthen climate resilience, reduce exposure to climate-related risks, and support sustainable urban development in a way that is both actionable and locally relevant. Over time, these measures are expected to enhance institutional preparedness, encourage environmentally responsible practices, and contribute to healthier, more resilient urban systems.

We acknowledge and appreciate the commitment of partner organisations, government stakeholders, technical experts, and community members whose contributions have been instrumental in shaping this plan. Their collective effort demonstrates the value of shared responsibility and coordinated action in responding to complex climate challenges.

We hope that effective implementation of the Climate Action Plan will provide a strong foundation for Jalgaon's continued progress, supporting the city in building a climate-resilient and environmentally sustainable future for generations to come.



Smt. Bijal Brahmbhatt

Executive Director and Managing Trustee,
Mahila Housing Trust

Climate change is a lived reality, especially for vulnerable urban communities. Cities like Jalgaon are already experiencing rising temperatures, water stress, and increased frequency of extreme weather events. These challenges disproportionately impact low-income households, particularly women, who are at the forefront of managing these daily risks.

At Mahila Housing Trust (MHT), we believe that resilient cities are built through inclusive, community-led approaches. The Jalgaon Climate Action Plan represents a significant step toward strengthening local resilience by combining sectoral insights of Jalgaon with the lived experiences of communities. This plan reflects a collaborative effort involving local stakeholders, government institutions, and community leaders ensuring that the solutions proposed are both practical and equitable.

What stands out in this document is the emphasis on the ground realities and distinct needs of small cities. MHT has consciously and meticulously developed a tool tailored for small cities like Jalgaon. The strategic action co-developed in the document integrates climate adaptation into everyday urban systems - energy, housing, water, sanitation and hygiene (WASH), solid waste and mobility. We believe that we can create climate resilient cities through engaging women from low-income communities and emphasising on affordable solutions.

This document is not just a plan, but a call to action. Its success will depend on continued partnerships and active participation from all stakeholders. Together, we have the opportunity to transform Jalgaon into a model of inclusive and climate-resilient urban development.

We appreciate the commitment of all partners and community members who have contributed to this effort, and we look forward to supporting its implementation.



Jignesh Mehta

Co-founder and Director, Urban Design and Planning
HuE Design and Planning Studio

India's urban population is growing at a rapid pace; and the cities have a crucial role to play in improving the quality of life of the urban population. Quality of life in our cities is closely linked with the impacts of climate change, such as urban heat island effect, urban flooding, depleting ground water, issues related to air quality amongst others. These impacts are not experienced only in large metropolitan cities, but also in smaller tier-2 and tier-3 cities.

Today India has 8 tier-1 cities. According to an estimate, there are more than 90 tier-2 cities and hundreds of tier-3 cities across India. However, so far, majority of the Climate Action Planning has focused on larger, metro cities and very little attention is paid to tier-2 and tier-3 cities. These cities too are equally vulnerable to the impacts of climate change and they require a planning and development approach that is different from the tier-1 metro cities.

In this context, the Jalgaon Climate Action Plan represents a pivotal step toward building a resilient and sustainable future for the city and its people. This plan is both a roadmap and a call to action- urging citizens, institutions, and policymakers to work together in safeguarding Jalgaon's environment while fostering economic and social well-being.

As an urban planner with more than 27 years of experience working in different countries, I have witnessed how cities that embrace proactive climate strategies not only mitigate the GHG emissions but also reduce the risks while unlocking new opportunities for innovation, equity, and growth. Jalgaon's commitment to integrating sustainable practices into urban development reflects a vision that is forward-looking and deeply rooted in local needs.

This document is not merely a technical plan; it is a collective promise. It has been prepared with a participatory and collaborative process across sectors. It sets the foundation for transforming Jalgaon into a greener and a more resilient with high quality of life. I am confident that with the continued collaborations between Mahila Housing Trust, Jalgaon City Municipal Corporation, the State Government and the People of Jalgaon, this plan will become a model for other cities striving to balance development with ecological stewardship.

Abbreviations

AQI	Air Quality Index
BAU	Business-As-Usual
CAP	Climate Action Plan
CGWB	Central Ground Water Board
COP	Conference of Parties
CPCB	Central Pollution Control Board
ECBC	Energy Conservation Building Code
FSSM	Faecal Sludge & Septage Management
GHG	Greenhouse Gas
IMD	India Meteorological Department
IPCC	Intergovernmental Panel on Climate Change
JCMC	Jalgaon City Municipal Corporation
LST	Land Surface Temperature
MHT	Mahila Housing Trust
MIDC	Maharashtra Industrial Development Corporation
MPCB	Maharashtra Pollution Control Board
MSEDCL	Maharashtra State Electricity Distribution Company Limited
NAPCC	National Action Plan on Climate Change
NCDC	National Center for Disease Control
NCEI	National Centers for Environmental Information
NDC	Nationally Determined Contribution
PMUY	Pradhan Mantri Ujjwala Yojana
PM _{2.5}	Particulate Matter with diameter less than 2.5 micrometres
PM ₁₀	Particulate Matter with diameter less than 10 micrometres
NO ₂	Nitrogen Dioxide
SO ₂	Sulphur Dioxide
PWD	Public Works Department
RTO	Regional Transport Office
SAPCC	State Action Plans on Climate Change
SDG	Sustainable Development Goals
SSP	Shared Socioeconomic Pathway
STP	Sewage Treatment Plant
UNFCCC	UN Framework Convention on Climate Change
USGS	United States Geological Survey



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Executive Summary

■ Background

Climate change has emerged as a critical systemic risk, with accelerated warming and more frequent extreme events threatening economies, ecosystems and public health, and disproportionately affecting vulnerable communities. This urgency has driven the establishment of global and national climate frameworks that define temperature goals, commitments and implementation pathways.

Under the United Nations Framework Convention on Climate Change (UNFCCC), the Paris Agreement sets a long-term objective of holding the increase in global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5°C. These goals are linked to the Sustainable Development Goals (SDGs), where climate action, sustainable cities, health, water and energy are mutually reinforcing agendas. India, as a Party to the UNFCCC and Paris Agreement, has submitted nationally determined contributions (NDCs) that commit to reducing the emissions intensity of GDP, increasing non-fossil fuel-based power capacity and strengthening adaptive capacity, alongside a declared net-zero target for 2070. The National Action Plan on Climate Change (NAPCC) provides the overarching framework for sectoral missions, and explicitly recognises the role of cities in delivering mitigation and adaptation outcomes.

Maharashtra is translating these national commitments through its State Action Plan on Climate Change and related strategies, which identify key vulnerabilities and priority actions in areas such as urban development, water resources and disaster risk management. State-level analyses indicate continued increases in mean temperatures and shifts in rainfall patterns, with significant implications for rapidly urbanising centres.

Within this multi-level architecture, cities are expected to quantify emissions, assess climate risks and prepare climate action plans aligned with national and state goals. Jalgaon, as a regionally significant tier-2 city, is part of this emerging network. The Jalgaon Climate Action Plan (JCAP) has been conceived as the city-level instrument that situates Jalgaon within India's NDCs, NAPCC and Maharashtra's State Action Plan on Climate Change, and provides an integrated, evidence-based framework for local climate action and climate-responsive urban development.



Figure 1: Climate policy flow from global to city level (Source: MHT)

■ Project Inception and Preparation

The Jalgaon Climate Action Plan (JCAP) has been prepared as a formal planning instrument of Jalgaon City Municipal Corporation (JCMC) to operationalise climate action at the city level. The inception phase established the mandate, scope and institutional arrangements for the CAP, identified priority urban systems to be covered, and designated a core team of MHT along with technical partners supporting JCMC, to steer the process.

The climate action planning process followed a defined sequence. Baseline information on Jalgaon's geography, demographics, land use and infrastructure was consolidated to provide the foundational city profile. On this basis, a contextualised greenhouse gas emissions inventory was prepared, followed by climate risk assessments for heat, water and air quality, and vulnerability analyses focusing on climate-vulnerable population groups and neighbourhoods across the city. These analytical steps were undertaken using an assessment framework aligned with international climate science, including guidance from the Intergovernmental Panel on Climate Change (IPCC) on risk, vulnerability and adaptation, while being adapted to Jalgaon's specific data and institutional context. The results informed the subsequent development of future emissions scenarios and the identification of thematic sectors for climate action, as set out in the CAP.

Stakeholder engagement was conducted as an integral component of the process. Structured consultations and workshops were held with relevant JCMC departments, state-level agencies, local experts, civil society organisations and representatives of vulnerable communities. This engagement supported data validation, surfaced local perspectives on climate impacts and service deficits, and helped establish a shared institutional understanding of Jalgaon's climate priorities.

An organogram of JCMC departments and external stakeholders relevant to JCAP has been developed to clarify roles and responsibilities for climate-related data, implementation and coordination. The CAP process flow and consultation visuals in the main document depict the institutional pathway through which JCAP has been conceived and prepared, and provide the basis for subsequent governance and monitoring arrangements.



Consultation meeting with JCMC officials



Capacity Building - Community led Heat Mapping

Figure 2: Stakeholder consultation and community-led capacity building for the Jalgaon Climate Action Plan (Source: MHT)

■ City Context

Jalgaon is a regionally significant city in northern Maharashtra, acting as a key urban, commercial and service centre for the surrounding district and wider region. The city's economy is closely linked to agriculture and agro-processing, trade, transport and small-scale industry, with Jalgaon functioning as a hub for agricultural produce markets and associated logistics.

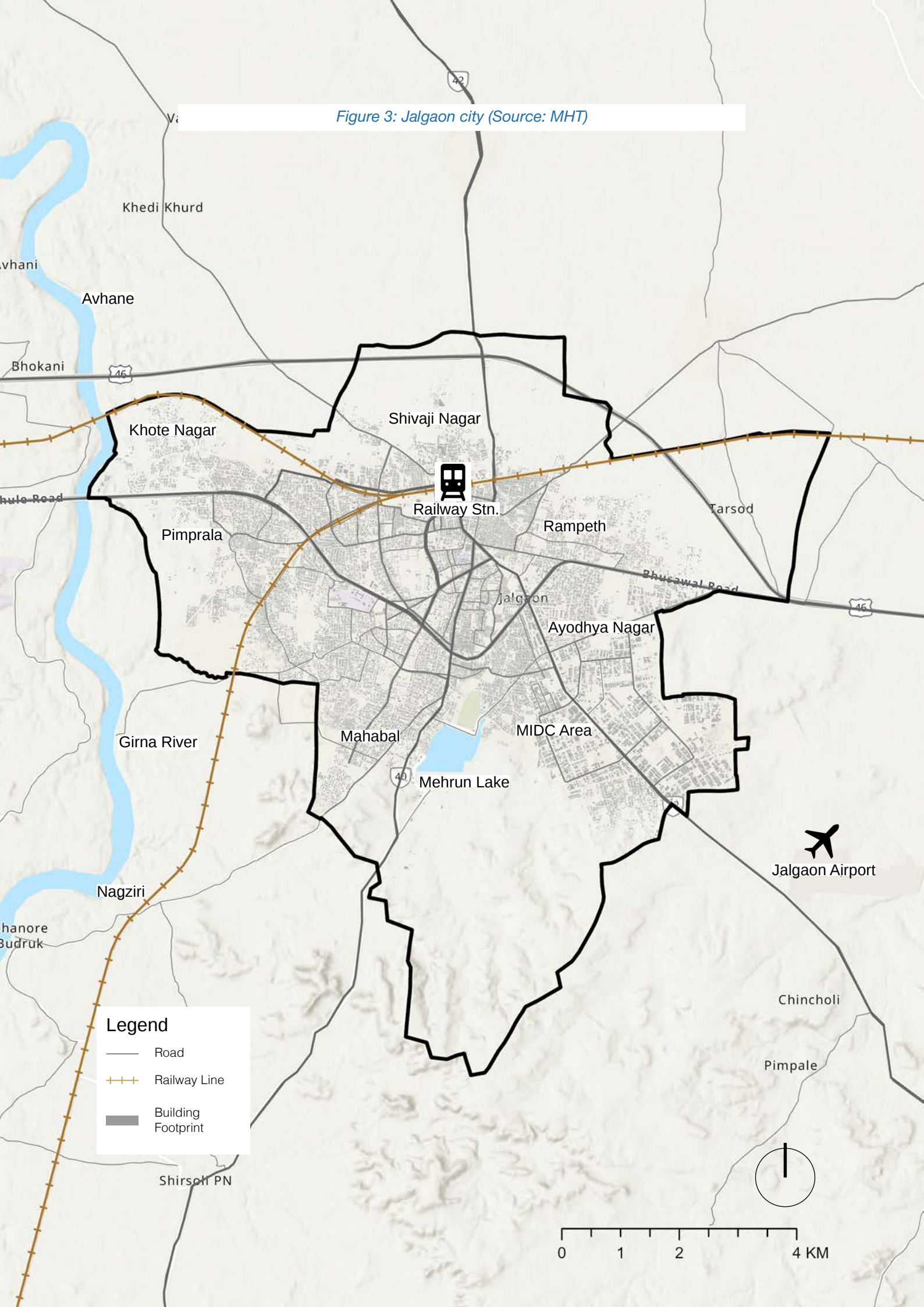
Jalgaon City Municipal Corporation (JCMC) administers 19 wards that together form a compact but expanding urban area comprising a dense core, mixed residential-commercial belts, industrial clusters and peripheral neighbourhoods. As of 2024, the city's population is estimated at about 6.51 lakh, reflecting cumulative growth of roughly 216.7% over the past three decades. A primary survey by Mahila Housing Trust (MHT) identified around 25 notified slum settlements with approximately 11,659 households, indicating a substantial concentration of residents living in settlements characterised by service and infrastructure deficits and heightened climate vulnerability.

Urban growth has been accompanied by significant expansion of built-up area and reconfiguration of land uses. Analysis of built-up growth and spatial patterns shows intensification in inner wards and corridor-based expansion towards the urban fringe, where agricultural and open lands have been converted to urban use. The Development Plan for Jalgaon extends the earlier planning area to a larger urban and peri-urban extent, formally bringing new growth corridors, industrial zones and residential clusters under municipal planning, land-use regulation and infrastructure provision. This growth trajectory, combined with limited green and open spaces, contributes to elevated urban heat, localised drainage challenges and rising transport demand.

The city is characterised by a hot semi-arid climate, with high summer temperatures and a clear warming trend over recent decades. Long-term records show that average annual temperatures have increased, and the number of days with maximum temperature above 40°C has risen notably since the mid-1980s, intensifying heat-stress conditions in dense built-up areas. Rainfall exhibits year-to-year variability, and observed trends in pre-monsoon groundwater levels point to emerging pressures on water security at both city and district scales. These climatic patterns interact with uneven access to water supply, sanitation, drainage and solid waste services, particularly in slum settlements and other vulnerable neighbourhoods, shaping Jalgaon's overall climate-risk profile.

Institutionally, JCMC is the principal urban local body responsible for civic administration, infrastructure provision and municipal service delivery. It operates through a political wing led by the Mayor and an administrative wing headed by the Municipal Commissioner, supported by departments for governance, finance, infrastructure, health, environment and emergency response, working in coordination with relevant state and regional agencies. In the context of JCAP, this arrangement provides the governance framework for climate-related actions across key sectors including energy, transport, solid waste, heat adaptation and water and sanitation.

Figure 3: Jalgaon city (Source: MHT)



■ Baseline Assessment

The Jalgaon Climate Action Plan is anchored in a baseline assessment that integrates a greenhouse gas emissions profile and vulnerability analysis for the city. This assessment describes the current condition of Jalgaon's urban systems under climate change and provides the reference framework for subsequent mitigation and adaptation planning.

The emissions baseline evaluates how Jalgaon's key urban systems generate greenhouse gas emissions by examining activity levels, electricity and fuel use in buildings and municipal services, and the prevailing practices for collection, disposal and treatment of solid waste and wastewater. The climate risk and vulnerability baseline assesses how climate-related stresses and shocks affect different neighbourhoods and population groups, and relates these impacts to socio-economic conditions and access to essential urban services such as water supply, sanitation, drainage, health and green spaces, with particular attention to communities facing multiple forms of deprivation. These are the sectors that have been assessed:

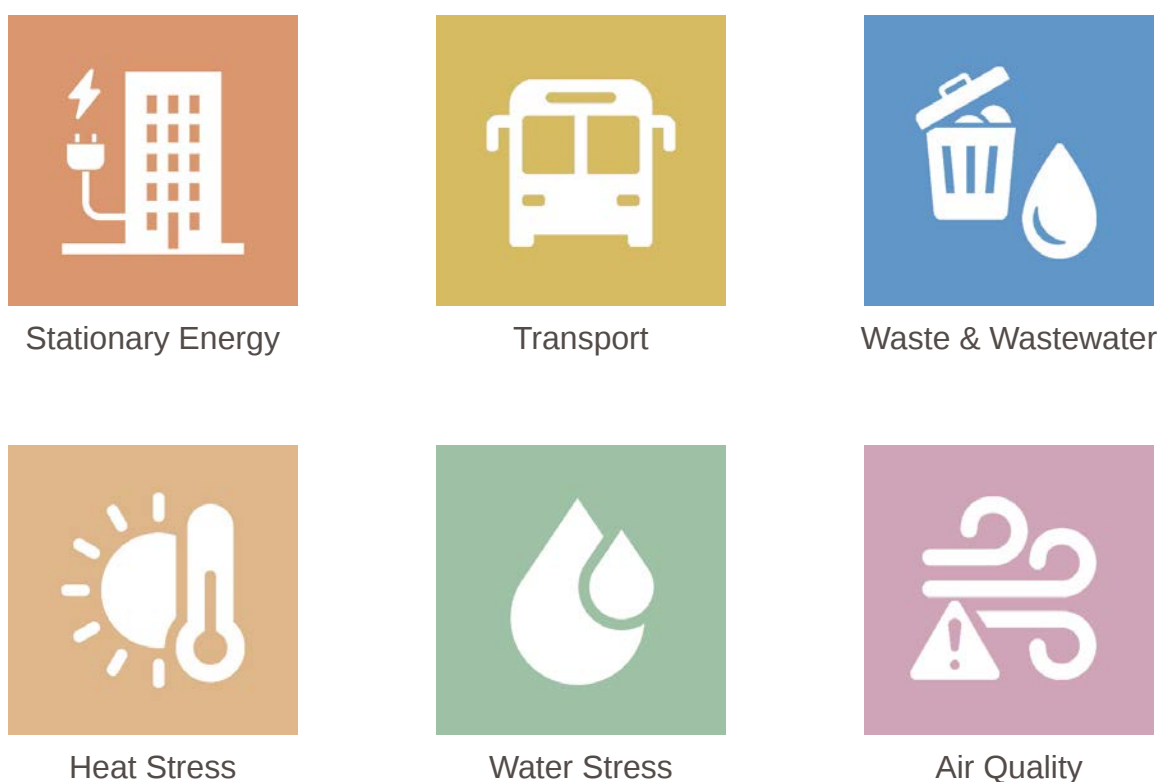


Figure 4: Sectors identified for GHG emissions and Vulnerability assessment for Jalgaon (Source: MHT)

The baseline assessment is guided by an analytical framework consistent with the IPCC approach and is applied using contextualised grounded data and stakeholder inputs. Community surveys, departmental datasets and consultations with residents, civil society and municipal staff are incorporated to ensure that the baselines reflect Jalgaon's institutional and community realities. This baseline of emissions and vulnerability provides the foundation for identifying where mitigation and adaptation efforts are most required and for designing sectoral strategies that respond to Jalgaon's specific climate challenges.

■ GHG Emissions

The Jalgaon Climate Action Plan establishes a contextualised GHG emissions inventory for the baseline year 2024, providing a quantitative picture of emissions associated with the city's key urban systems. For the year 2024, total emissions are estimated at 4.45 lakh tCO₂e, corresponding to per-capita emissions of 0.68 tCO₂e per person. The inventory covers stationary energy, transport, solid waste and wastewater, reflecting practices as they exist today.

Stationary energy is the largest source, contributing 41% of total emissions from electricity and fuel use in residential, commercial, industrial, institutional and municipal buildings and facilities. Transport accounts for 24% of emissions, driven by the predominance of road-based mobility across two-wheelers, cars, auto-rickshaws, buses and freight vehicles, and growth along major corridors that reinforces vehicle dependence. Solid waste contributes 32% of Jalgaon's emissions, a relatively high share closely linked to mixed waste collection, open dumping, legacy disposal sites and limited processing of biodegradable waste that together generate substantial methane. Wastewater contributes 3% of emissions, arising from sewerage networks, open drains and treatment facilities where incomplete coverage and anaerobic conditions lead to additional greenhouse gas formation.

The predominance of stationary energy and transport underscores the need for focused action in buildings, municipal services and urban mobility, while the relatively high contribution from solid waste highlights the importance of enhanced segregation, processing and scientific disposal; wastewater, though smaller, still warrants targeted improvements in collection and treatment. If Jalgaon continues on a business-as-usual trajectory from the 2024 baseline, its overall GHG emissions are expected to rise further; this makes it essential to identify the city's mitigation potential and to quantify how far emissions can be reduced from business-as-usual levels.

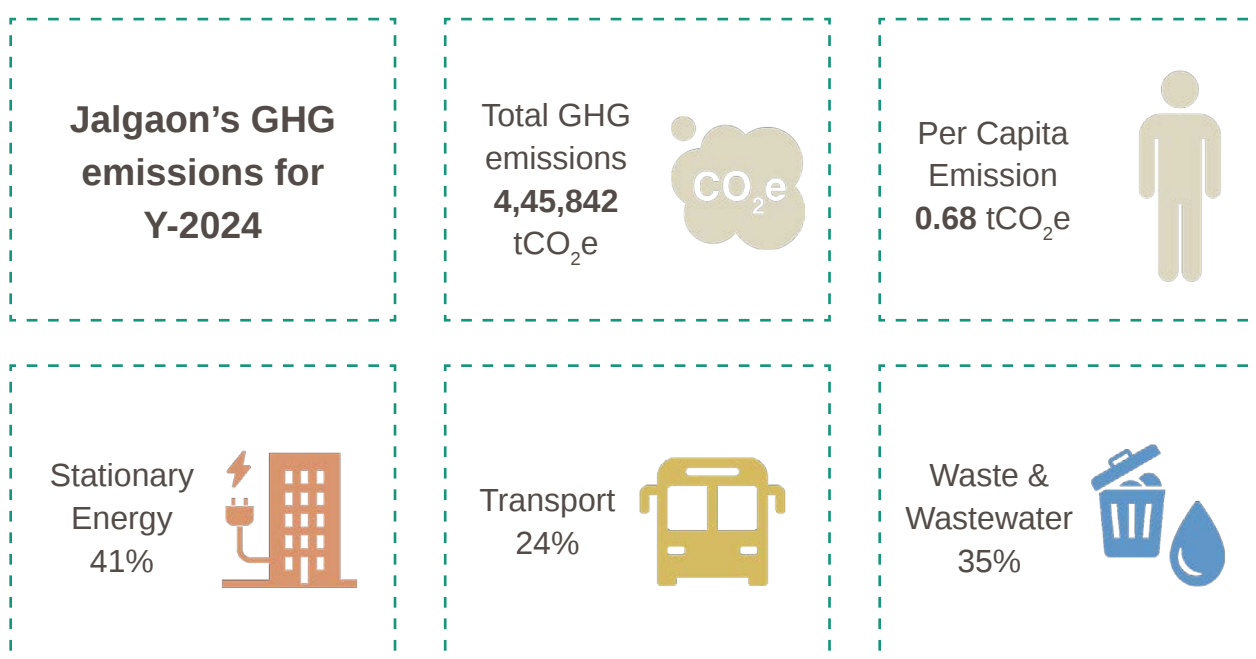


Figure 5: GHG emissions share (Source: MHT)

■ Future Emissions Scenarios and Targets

Future emissions scenarios and targets for Jalgaon are derived from the 2024 greenhouse gas inventory and the sectoral diagnostics presented in this chapter. They outline how emissions may evolve under different assumptions about urban growth, technology choices and policy implementation, and provide a structured basis for defining mitigation targets that are both credible and progressive.

Business-as-usual Scenario: The activity levels in stationary energy, transport, waste and wastewater follow recent trends, and only currently committed policies and investments are considered. This pathway results in an overall increase of approximately 159% in GHG emissions by 2070 relative to the 2024 baseline, underscoring that prevailing trajectories are misaligned with Jalgaon’s climate and resilience objectives.

Co-created Scenario: It incorporates planned measures developed jointly with JCMC, other stakeholders and community representatives, and therefore reflects a collectively endorsed and practically implementable level of action. Under this scenario, total emissions decline by around 77.5% compared with the BAU pathway 2070 and by 42% relative to the baseline 2024, demonstrating that coordinated implementation of agreed interventions can substantively moderate Jalgaon’s emissions growth.

Ambitious Scenario: It builds on the Co-created scenario but assumes accelerated deployment of low-carbon technologies, stronger regulatory instruments and deeper behavioural change across sectors. It achieves the largest reduction in emissions-on the order of 100% relative to BAU 2070 and Baseline 2024 - illustrating the city’s full mitigation potential if climate action is prioritised in planning, investment and governance decisions.

The scenarios show that Jalgaon’s climate goals are realistically met through the Co-created pathway, while the Ambitious pathway captures the city’s additional mitigation potential beyond planned actions.

Emission Scenarios	2024 (Baseline)	2030	2050	2070
Business - as - usual		 ↑ 19%	 ↑ 80%	 ↑ 159%
Co-created		 ↓ -1%	 ↓ 9%	 ↓ 42%
Ambitious		 ↓ 9%	 ↓ 37%	Net-Zero ↓ 100%

Figure 6: GHG emissions mitigation potential - scenarios (Source: MHT)

Vulnerability Assessment

The Vulnerability Assessment for Jalgaon examines how water stress, heat stress and air quality interact with the city's physical form, infrastructure and settlement pattern to shape risk. It uses recent climate data, groundwater trends, AQI parameters and service-access indicators to identify both high-risk locations and vulnerable population groups.



Water Stress:

It is characterised by variability in annual precipitation, declining pre-monsoon groundwater levels and uneven coverage of water-supply and wastewater infrastructure across wards. In addition, documented waterlogging and local flooding points indicate drainage constraints that can damage assets and contaminate drinking-water sources, especially in dense settlements and notified slums, where limited service access heightens exposure to both scarcity and flood-related disruptions.



Heat Stress:

Heat Stress in Jalgaon is driven by rising average temperatures, more frequent days with maximum temperatures above 40°C, and the growth of dense built-up areas with limited vegetation. These conditions intensify urban heat island effects in compact wards and informal settlements, where poor housing quality, limited access to cooling and high outdoor work exposure combine to create elevated health risks for low-income and other vulnerable groups.



Air Quality:

It is characterised by elevated concentrations of PM_{2.5} and PM₁₀ above CPCB permissible limits, alongside localized NO₂ and SO₂ exposure in traffic-intensive and mixed-use areas. Residents in congested corridors, slum clusters and neighbourhoods with limited green cover experience prolonged contact with suspended particulate matter, linking mobility patterns and land-use intensity to increased respiratory and cardiovascular risk, especially for sensitive groups such as children and older adults.

Overall, the water, heat and air-quality assessments show that Jalgaon's climate vulnerability is driven by service gaps, land-use intensity and exposure conditions rather than hazards alone. By highlighting locations - neighbourhoods and settlement types with concentrated risk, the analysis provides a basis for prioritising adaptation and mitigation measures, particularly where infrastructure strengthening and inclusive service delivery can deliver the greatest resilience gains.

Vision for Jalgaon 2070

Towards a low-carbon future with inclusive growth and resilient development

Jalgaon is increasingly exposed to climate and environmental stresses that affect public health, infrastructure, essential services, and overall quality of life. Rising heat, water stress, and deteriorating air quality are placing growing pressure on the city's urban systems, with the greatest impacts often felt by vulnerable and underserved communities. In this context, the long-term vision is to: **Lead Jalgaon towards a low-carbon future with inclusive growth and resilient development. This will guide Jalgaon's transition to net zero so that the city can meaningfully contribute to India's commitments to fight against climate change.**

The Jalgaon Climate Action Plan sets out a long-term pathway for this transition, supported by phased targets and interim milestones across key sectors. Co-developed by Mahila Housing Trust with the support of the Jalgaon City Municipal Corporation, and informed by local stakeholders, government institutions, and community inputs, the plan reflects both city-level priorities and on-ground realities. Its approach combines mitigation and adaptation through actions related to energy, mobility, waste, water, sanitation, and heat resilience.

This vision seeks to ensure that climate action in Jalgaon is practical, locally grounded, and responsive to the needs of the city's residents. It aims to improve service systems, reduce environmental risk, strengthen institutional preparedness, and guide future growth along a cleaner and more resilient pathway. The Climate Action Plan is developed around three core principles that define its overall direction and priorities.

Core Principles



Low-Carbon Future

Supporting cleaner and more efficient urban growth while reducing emissions across key sectors.



Inclusive Growth

Ensuring that climate action benefits all residents, especially vulnerable and underserved communities.



Resilient Development

Strengthening the city's capacity to anticipate, withstand, and respond to impacts of climate change and environmental stresses.



■ Sectoral Strategies



Efficient and Clean Stationary Energy

Objectives

1. Transition to Renewable energy in buildings and public infrastructure

2. Promote Energy Efficiency and Retrofit of Existing Buildings

3. Encourage Climate-Responsive and Green Building Principles New Buildings

4. Clean Thermal Energy Transition

5. Industrial and Construction Materials Decarbonisation

6. Governance



Low-Emission and Inclusive Mobility

Objectives

1. Public Transport Improvement and Fleet Electrification

2. Transition of Private Vehicles and Intermediate Public Transport to EV

3. Encourage NMT: especially for shorter trips

4. Traffic Management and Parking Regulation

5. Clean Urban Freight and E-Commerce Delivery Transition



Sustainable Solid Waste Management

Objectives

1. Source Segregation and Collection Strengthening

2. Decentralised Dry Waste Recovery and Circular Economy

3. Plastic Waste Reduction and Alternatives

4. Organic Waste Processing and Resource Recovery

5. Scientific Disposal of Residual Waste



Urban Greening & Heat

Objectives

1. Increasing the Per capita Green space in the City

2. Monitoring and Maintaining the Existing trees in the City

3. Improving Heat Monitoring and Warning system in the City

4. Improving Healthcare accessibility for Heat related illnesses

5. Increasing Resilience to Urban Heat for Vulnerable Communities



Sustainable Water Systems

Objectives

1. Recharge the Natural aquifers

2. Rejuvenation of Surface Water bodies

3. Efficient use of Water in all New and Existing buildings



Clean Air and Pollution Control

Objectives

1. Reducing Emissions from Vehicles

2. Reducing Air pollution from Construction activities

3. Reducing Air pollution from Industrial activities



The sectoral strategies in the Jalgaon Climate Action Plan translate the city's climate vision into a coordinated set of actions across six key areas: Efficient and Clean Stationary Energy, Low-Emission and Inclusive Mobility, Sustainable Solid Waste Management, Urban Greening and Heat, Sustainable Water Systems, and Clean Air and Pollution Control. These strategies are directly informed by the GHG inventory and vulnerability assessment, so that mitigation and adaptation are integrated into sectoral planning and investments.

Efficient and Clean Stationary Energy focuses on improving energy performance in municipal buildings, public lighting and key urban services through efficiency upgrades, better asset management and cleaner energy options, reducing emissions from electricity and fuel use while lowering operating costs. Low-Emission and Inclusive Mobility promotes public and shared transport, better regulation and integration of intermediate modes, and targeted congestion and safety measures that curb transport-related emissions and reduce exposure to air pollution, particularly for low-income and peripheral settlements. Sustainable Solid Waste Management strengthens collection, segregation, resource recovery and safe treatment and disposal, thereby reducing methane emissions and local health and environmental risks.

Urban Greening and Heat prioritises tree planting, open-space improvements and heat-resilient design in dense, vulnerable neighbourhoods to improve micro-climate conditions and reduce heat stress. Sustainable Water Systems address water-supply reliability, drainage and wastewater performance to manage water scarcity, flooding and contamination risks highlighted in the vulnerability assessment. Clean Air and Pollution Control consolidates regulatory, planning and monitoring measures for particulate and gaseous pollutants, building on AQI findings and spatial pollution analysis to guide action in traffic corridors and mixed-use zones.

Sectoral implementation responsibilities lie primarily with Jalgaon City Municipal Corporation (JCMC) and its relevant departments, which are expected to incorporate these recommendations into ongoing programmes, projects and budgets, in coordination with other agencies and community stakeholders. Mahila Housing Trust (MHT) will support JCMC in monitoring, reviewing and refining the implementation of these strategies and their mitigation and adaptation outcomes over time, which will help in achieving a low-carbon future with inclusive growth and resilient development, and guiding Jalgaon's transition towards net-zero so that the city can meaningfully contribute to India's commitments to fight climate change.



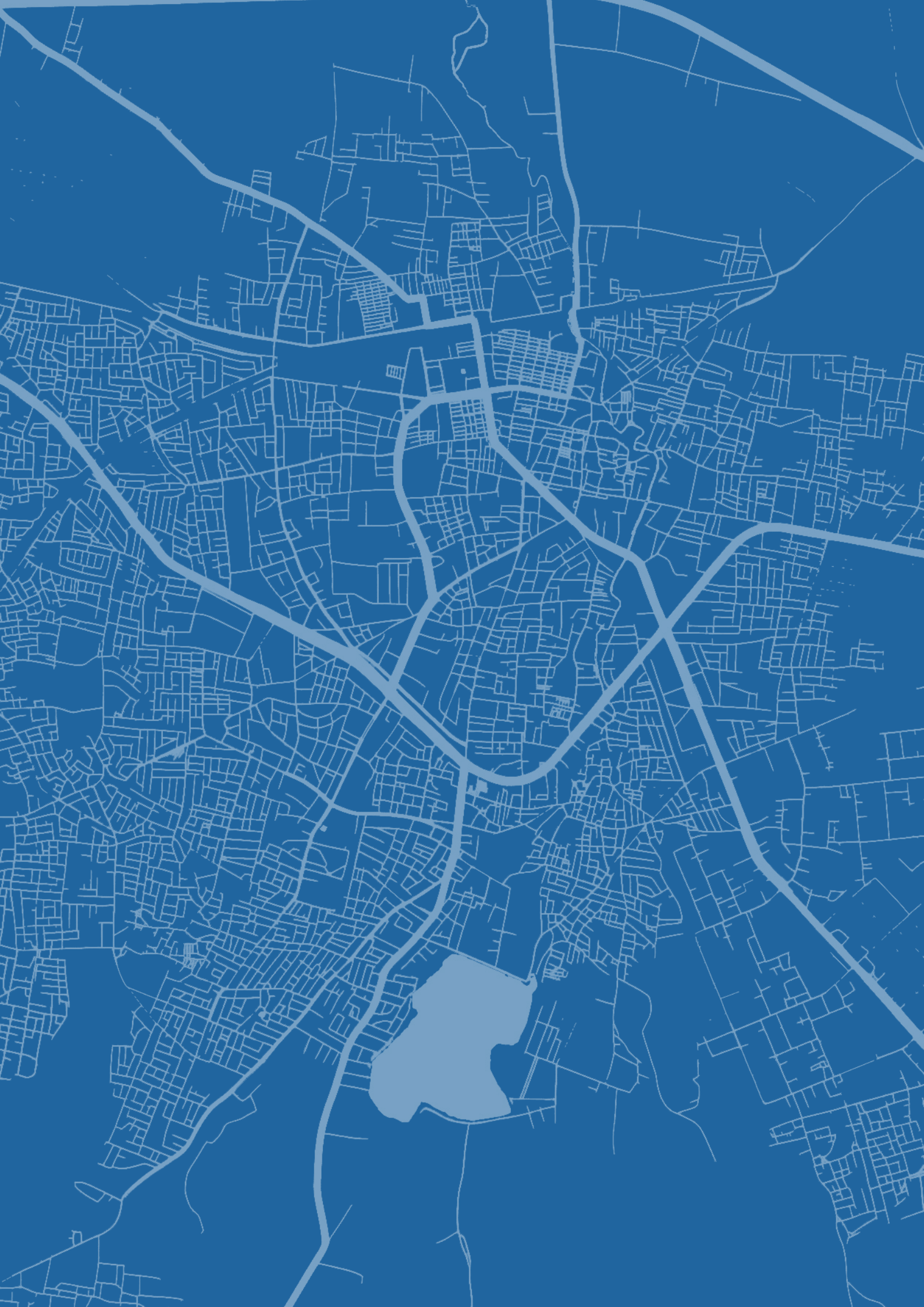
जळगांव शहर महानगरपालिका जळगांव प्रशासकीय इमारत



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Section I

Context

1. Introduction

Climate change is one of the most pressing challenges of our time, with profound implications for ecosystems, economies, infrastructure, and human well-being. Climate change refers to long-term shifts in temperature, rainfall, and weather patterns, driven primarily by human activities that increase the concentration of greenhouse gases in the atmosphere. The combustion of fossil fuels, industrial processes, land-use change, and waste-related emissions have significantly intensified the greenhouse effect, resulting in rising global temperatures and widespread environmental disruption. What was once treated as a gradual environmental concern has now emerged as a full-scale global crisis, affecting ecosystems, economies, infrastructure, public health, and human settlements across the world.

The urgency of climate change is no longer theoretical. Its impacts are already being experienced through rising temperatures, more frequent and intense heatwaves, changing rainfall patterns, prolonged droughts, destructive floods, sea-level rise, and increasing stress on food, water, and energy systems. Around 3.3 to 3.6 billion people already live in contexts that are highly vulnerable to climate change, underscoring the extent to which large populations are already exposed to climate-related risks.¹

Recent global observations reinforce the seriousness of the crisis. The World Meteorological Organization has confirmed 2024 as the warmest year in the 175-year observational record, with global mean temperature estimated at about 1.55°C above the 1850-1900 average.² The last decade has also been the warmest on record, while greenhouse gas concentrations, ocean heat content, glacier loss, and sea-level rise have continued to reach record levels. These trends show that climate change is not a distant possibility but a present and escalating threat that demands urgent and coordinated action.

For cities, the implications are particularly significant. Urban areas concentrate population, infrastructure, energy demand, transport activity, buildings, and waste systems, which makes them both major sources of emissions and highly exposed centres of climate risk. As a result, climate change has become a central concern for urban development, resilience, and governance rather than a standalone environmental issue.

■ Key Climate Concerns:



Long-term increase in average temperatures are altering climatic conditions across regions, increasing thermal discomfort, stressing natural systems, and intensifying the overall risk of climate-related impacts.



Heatwaves are becoming more frequent, intense, and prolonged, with serious implications for human health, labour productivity, energy demand, and urban liveability, particularly for vulnerable populations.

1. IPCC, Climate Change 2023: Synthesis Report, Summary for Policymakers, 2023.
2. WMO, State of the Global Climate 2024, 2025.



Changes in the timing, intensity, and spatial distribution of rainfall are making monsoon patterns more uncertain, increasing the likelihood of both short-duration heavy rainfall events and prolonged dry spells.



Climate variability is placing **growing pressure on both surface water and groundwater systems**, affecting water availability, recharge cycles, agriculture, and the reliability of urban water supply.



Climate change can **intensify air pollution and disease burdens**, creating compounding health risks, particularly for children, older adults, outdoor workers, and low-income communities.

The IPCC's "Hockey Stick" curve Figure 7 illustrates the significant increase in global temperatures since the advent of the industrial revolution. If effective climate actions are not taken, the average global surface temperature is expected to rise by more than 3°C by the end of this century, intensifying extreme weather events and heightening the risks faced by urban areas (UNEP & IEA, 2025).³

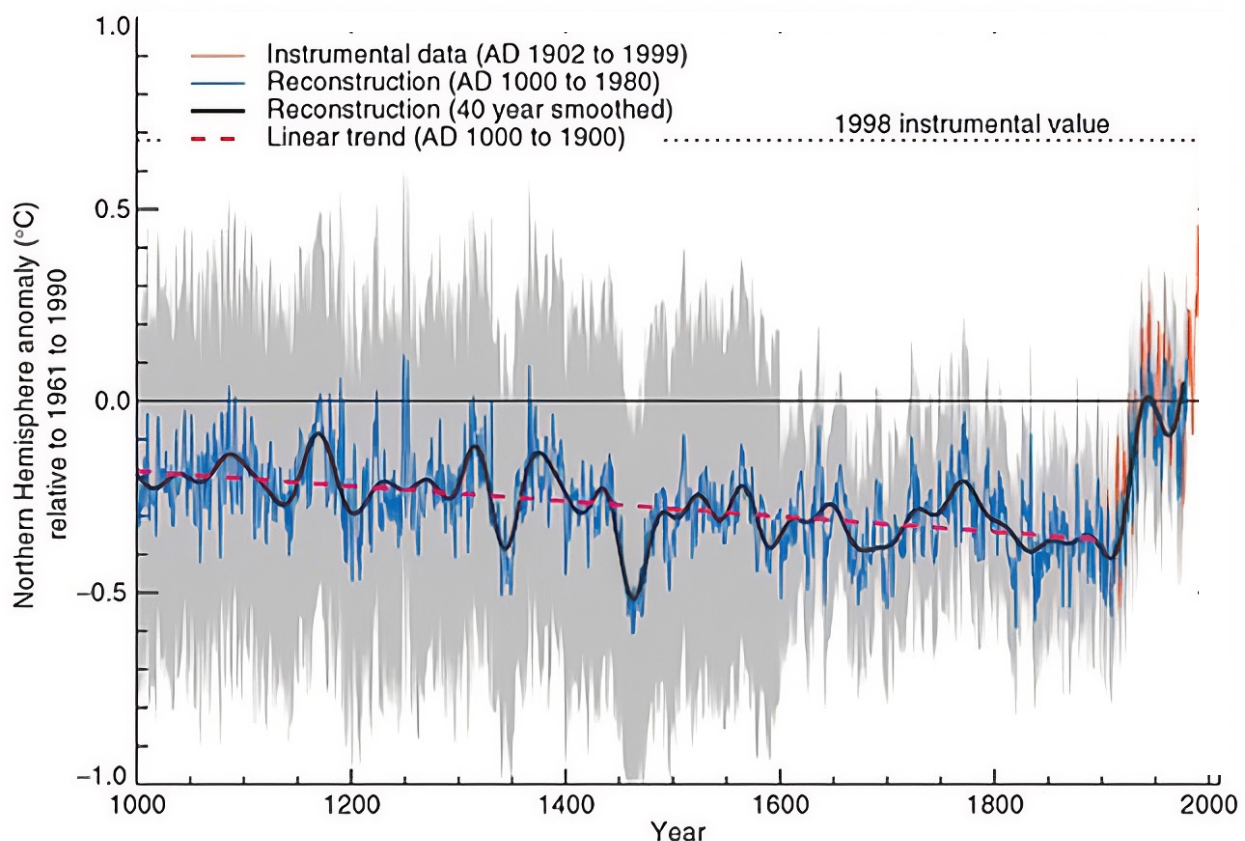


Figure 7: Northern hemisphere temperature anomaly 1000–2000 AD IPCC Hockey stick model (Source: IPCC, 2001)

3. UNEP and IEA, Global Energy and Climate Outlook, 2025.

The growing urgency of climate change has led to a strong international response centred on mitigation, adaptation, resilience, and climate justice. Over the past decade, climate governance has increasingly moved beyond scientific recognition of the problem toward institutional commitments aimed at limiting warming, reducing emissions, strengthening resilience, and supporting vulnerable countries and communities.

A major milestone in this regard is the Paris Agreement, adopted in 2015 under the United Nations Framework Convention on Climate Change (UNFCCC). The Paris Agreement provides the principal global framework for collective climate action and seeks to hold the increase in global average temperature to well below 2°C above pre-industrial levels while pursuing efforts to limit the rise to 1.5°C.⁴ It also requires countries to prepare and update Nationally Determined Contributions, strengthen adaptation efforts, and align development pathways with low-emission and climate-resilient futures.⁵

Alongside the Paris Agreement, the Sustainable Development Goals (SDGs) adopted under the 2030 Agenda reinforce the need for integrated climate action. In particular, SDG 13 calls for urgent action to combat climate change and its impacts, while other goals related to clean energy, sustainable cities, clean water, health, and reduced inequality highlight the cross-sectoral nature of the climate challenge.⁶ This is important because climate change affects not only the environment but also public health, livelihoods, infrastructure, equity, and long-term development outcomes.

Another important component of the global climate architecture is the Conference of the Parties (COP) under the UNFCCC, which serves as the principal intergovernmental forum for reviewing progress, negotiating new commitments, and strengthening implementation mechanisms.⁷ Through successive COP meetings, countries have advanced global action on mitigation, adaptation, climate finance, loss and damage, and transparency, making the COP process a critical driver of international climate governance.

At the same time, climate science continues to demonstrate the scale of the challenge. The world remains off track in relation to the temperature goals of the Paris Agreement, and current trends indicate that stronger action is needed across all levels of governance.⁸ Climate change is therefore not simply a future planning issue; it is an immediate policy challenge that requires coordinated responses across global, national, state, and local institutions.

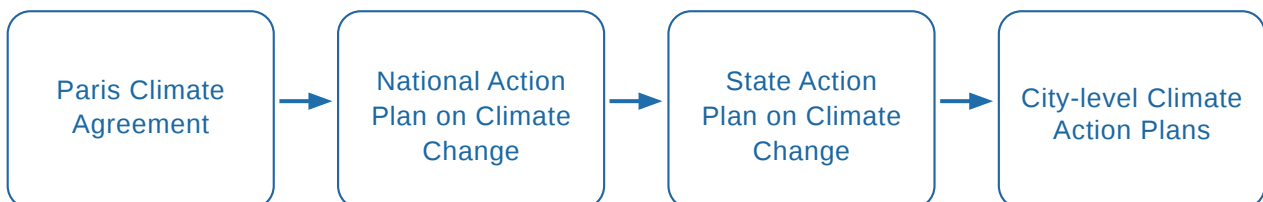


Figure 8: Climate policy flow (Source: MHT)

4. UNFCCC, Paris Agreement, 2015.

5. UNFCCC, Paris Agreement, Article 4 and Article 7, 2015.

6. UN, Transforming Our World: The 2030 Agenda for Sustainable Development, 2015.

7. UNFCCC, Conference of the Parties (COP): Functions and Mandate, accessed 2026.

8. UNEP, Emissions Gap Report 2023.

1.1 India's Climate Commitments

India's climate action is embedded within the global framework established by the Paris Agreement and is guided by its long-term development and emissions goals. India has committed to achieving net-zero emissions by 2070, with Nationally Determined Contributions (NDC) serving as the principal mechanism for defining interim climate targets and policy directions.⁹

India updated its first NDC in 2022, strengthening its 2030 mitigation commitments. These include reducing the emissions intensity of GDP by 45 percent from 2005 levels, achieving about 50 percent cumulative installed electric power capacity from non-fossil fuel-based energy resources, and creating an additional carbon sink of 2.5 to 3 billion tCO₂e through additional forest and tree cover.⁹ These targets provide the national direction for climate action and reinforce the need for implementation across sectors and levels of governance.

To operationalise these commitments, India follows a multi-level planning framework. The National Action Plan on Climate Change (NAPCC) provides the broad national strategy, while State Action Plans on Climate Change (SAPCC) translate this into state-level priorities and context-specific actions. At the local level, Climate Action Plans (CAP) support implementation through urban planning, service delivery, sectoral interventions, and institutional coordination.

The need for climate action in India is especially significant because of the central role of cities in both emissions generation and climate vulnerability. Urban areas are major consumers of energy and major sources of emissions from buildings, transport, industry, and waste, while also being increasingly exposed to heat stress, water insecurity, air pollution, and infrastructure vulnerability.¹⁰ This makes urban climate action central to both mitigation and adaptation goals.

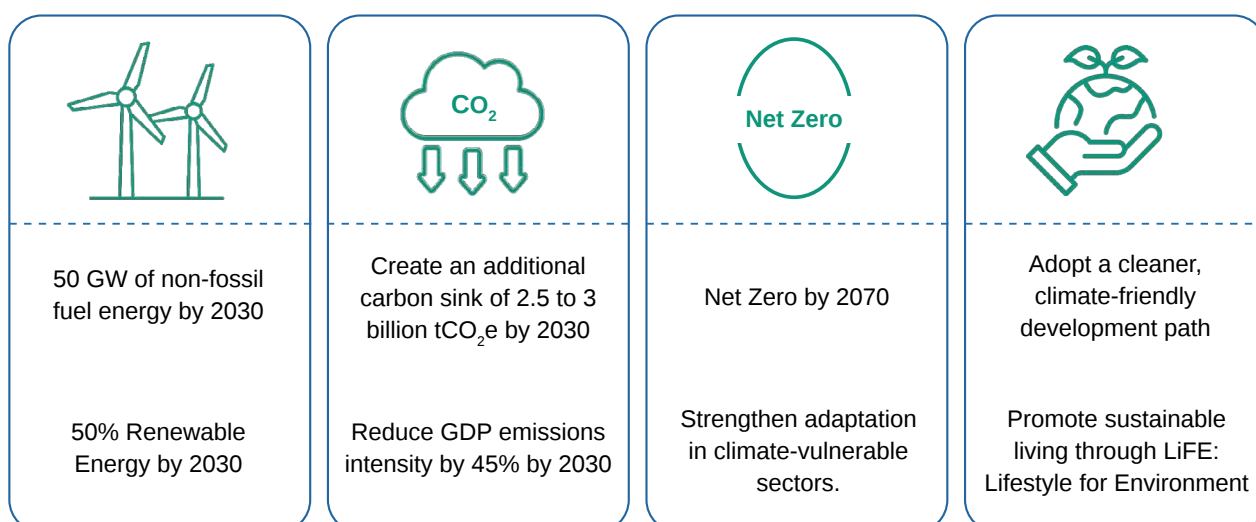


Figure 9: National climate goals under India's net-zero strategy (Source: Government of India, updated NDC submission to UNFCCC)

9. Government of India, Updated First Nationally Determined Contribution, UNFCCC submission, August 2022; net-zero 2070 announcement at COP26, 2021.

10. MoHUA and NIUA, ClimateSmart Cities Assessment Framework (CSCAF) reports, 2020–2021.

1.2 Climate Action at State Level

At the state level, climate action in Maharashtra is guided by the State Action Plan on Climate Change, which provides the policy framework for integrating climate concerns into development planning, sectoral governance, and implementation systems. The Maharashtra framework recognises that climate risks such as heat stress, water scarcity, environmental degradation, and infrastructure vulnerability must be addressed through coordinated action across departments and sectors rather than through isolated interventions.

The state's climate planning approach is particularly relevant to urban areas because it places emphasis on sectors that are directly linked to city systems and service delivery. These include water resources, public health, habitat, energy, transport, wastewater, and environmental resilience. In doing so, it creates a policy bridge between national climate commitments and local planning processes, enabling urban local bodies to position climate action within their routine governance, infrastructure planning, and investment decisions.

A notable strength of the Maharashtra SAPCC is that it is framed as a Pathways to 2030 document, giving it a clear near-term planning horizon while also supporting longer-term resilience and low-emission development. The framework seeks to move climate action beyond broad policy intent by linking it with implementation systems, sectoral responsibilities, and institutional coordination.

The state has also established a State Climate Action Cell (SCAC) under the Department of Environment and Climate Change to guide implementation of the SAPCC and improve coordination across government agencies and other stakeholders. According to the state order reported in 2023, the SCAC was constituted with five members and a director, and was intended to support prevention, adaptation, mitigation, coordination, and timely implementation of climate actions across sectors and levels of government.

Maharashtra's climate framework highlights the need for

Climate-resilient agriculture, water, and food systems.
Protection of forests, biodiversity, and critical habitats.
Heat-risk, health care systems, and disaster preparedness.
Decarbonisation of energy, transport, buildings, and waste systems.
Dedicated implementation through climate institutions and sectoral coordination.

This state-level orientation is particularly important because it enables city-level plans to be developed within an established policy structure rather than in isolation. It also reinforces the idea that local climate action must be integrated with sectoral functions, institutional responsibilities, and long-term development planning, making the SAPCC an important policy anchor for city climate action in Maharashtra.

1.3 Climate Action at City Level

City-level Climate Action Plans are strategic instruments that help urban local bodies translate broader climate commitments into local action. They provide a structured framework for understanding a city's emissions profile, identifying climate risks, prioritising sectoral interventions, and assigning responsibilities for implementation. In this way, a CAP supports both mitigation, by reducing greenhouse gas emissions, and adaptation, by strengthening resilience to climate impacts.

For cities, climate change is closely linked with everyday planning and governance functions, including land use, energy, transport, housing, water supply, sanitation, waste management, and public health. A city-level CAP therefore serves not only as an environmental strategy, but also as a framework for more resilient, inclusive, and coordinated urban development.

In the Indian context, the role of a CAP depends on the scale, economy, institutional capacity, and risk profile of each city. While larger metropolitan cities may focus on complex systems such as mass transit, regional infrastructure, and large-scale energy transition, tier-2 cities require a more grounded and implementation-oriented approach that responds directly to local service gaps and emerging climate pressures. For cities like Jalgaon, this means that climate action must be closely tied to municipal functions, community realities, and feasible sectoral interventions. Against this backdrop, the following document introduces the Jalgaon Climate Action Plan and its specific scope, structure, and distinguishing features.



Figure 10: Multi-level climate action alignment: Global, National, State, and City (Source: MHT)

2. Jalgaon Climate Action Planning Process

The Jalgaon Climate Action Plan (JCAP) has been developed as a city-specific framework to support climate-responsive planning and implementation within the jurisdiction of the Jalgaon City Municipal Corporation. It is the first Climate Action Plan prepared by the city and is intended to contribute to India's efforts toward achieving net-zero targets. The plan has been developed in alignment with the MSAPCC and is intended to guide the identification, prioritisation, and implementation of measures that address the city's climate-related risks and greenhouse gas emissions.

The JCAP brings together the key components required for climate action planning in Jalgaon, including an assessment of climate and environmental risks, a city-level greenhouse gas inventory, a vulnerability assessment, future emissions scenarios, sectoral action tracks, and an implementation and coordination framework. The plan focuses on six priority sectors - stationary energy, transport, waste & wastewater, urban heat, air quality, and water stress - each of which is central to the city's climate response and long-term resilience. The 2024 baseline and the targets extending to 2030, 2050, and 2070 provide the basis for action across these sectors, making the plan a practical decision-support tool for JCMC, relevant line departments, state agencies, and implementation partners.

The preparation of the JCAP has been informed by primary and secondary data, departmental inputs, stakeholder consultations, and community-level information from vulnerable areas. As a result, the document is designed to support a planning process that is evidence-based, locally relevant, and implementation-oriented.

2.1 Salient Features of the Plan

■ **Alignment with the State Goals:** The JCAP is aligned with the Maharashtra State Action Plan on Climate Change (MSAPCC), particularly in its emphasis on climate-resilient urban systems, heat-risk response, water security, and low-emission development.¹ The state framework highlights the need for stronger adaptation and mitigation action through sectors that are directly relevant to cities, including buildings, transport, water, wastewater, and public health. In Jalgaon, this alignment is reflected in action areas such as ECBC-linked building efficiency, public EV bus procurement, rainwater harvesting, expansion of sewage treatment, improved waste management, and household-level heat adaptation measures. Together, these interventions translate broader state-level climate priorities into a city-specific implementation framework suited to Jalgaon's risks, infrastructure systems, and institutional context.

■ **Inclusive Approach:** In addition to the data obtained from relevant departments, primary datasets were collected from vulnerable communities and high-risk areas to ensure that local conditions and lived experiences are adequately reflected, strengthening the contextual relevance and reliability of findings. This approach helps capture variations in service access and exposure that are often missed in secondary datasets. It also ensures that the plan reflects the realities of informal settlements and other climate-sensitive neighbourhoods.

■ **Contextualised GHG Inventory:** The JCAP adopts a contextualised greenhouse gas inventory approach that assesses emissions at the level of individual sources rather than relying on generalized national averages, enabling a more accurate and city-specific assessment. Standardised inventory and scenario-modelling approaches are often designed for larger urban centres and depend on extensive datasets that are not always available or relevant for Tier 2 and Tier 3 cities such as Jalgaon.

By using a simplified and local approach, MHT has tailored the inventory process to the city's actual data availability, making it more practical for the municipality to monitor emissions, update the inventory over time, and track progress against the plan's targets. The inventory also includes emissions sources that are often omitted in conventional approaches, such as crematoriums and septic tanks, ensuring a more comprehensive and context-sensitive accounting framework for Jalgaon.

■ **Implementation & Monitoring:** Jalgaon is committed to achieving the JCAP targets through inclusive actions and MHT is committed to conducting a systematic review and supporting municipal corporation in monitoring the actions, ensuring that the plan functions as a dynamic framework rather than a static report. It also helps keep the plan aligned with municipal priorities and evolving ground conditions.

2.2 CAP Process in Jalgaon

The Jalgaon Climate Action Plan was developed through a collaborative and iterative process with inputs from local consultations & reviews. Instead of relying on a single study, the plan evolved through successive stages of data gathering, validation, and refinement, allowing sectoral priorities to be grounded in Jalgaon's actual conditions. Inputs from municipal departments, stakeholder discussions, and community-grounded observations were used to test assumptions and shape action choices across mitigation and adaptation areas. The process also ensured that the plan remained practical for municipal implementation, while reflecting the city's vulnerability profile, emissions baseline, and long-term planning needs.

Figure 11 presents the overall process flow through which baseline assessment, consultations, sectoral analysis, scenario-building, and strategy co-creation were brought together to shape the final structure of the Jalgaon Climate Action Plan.

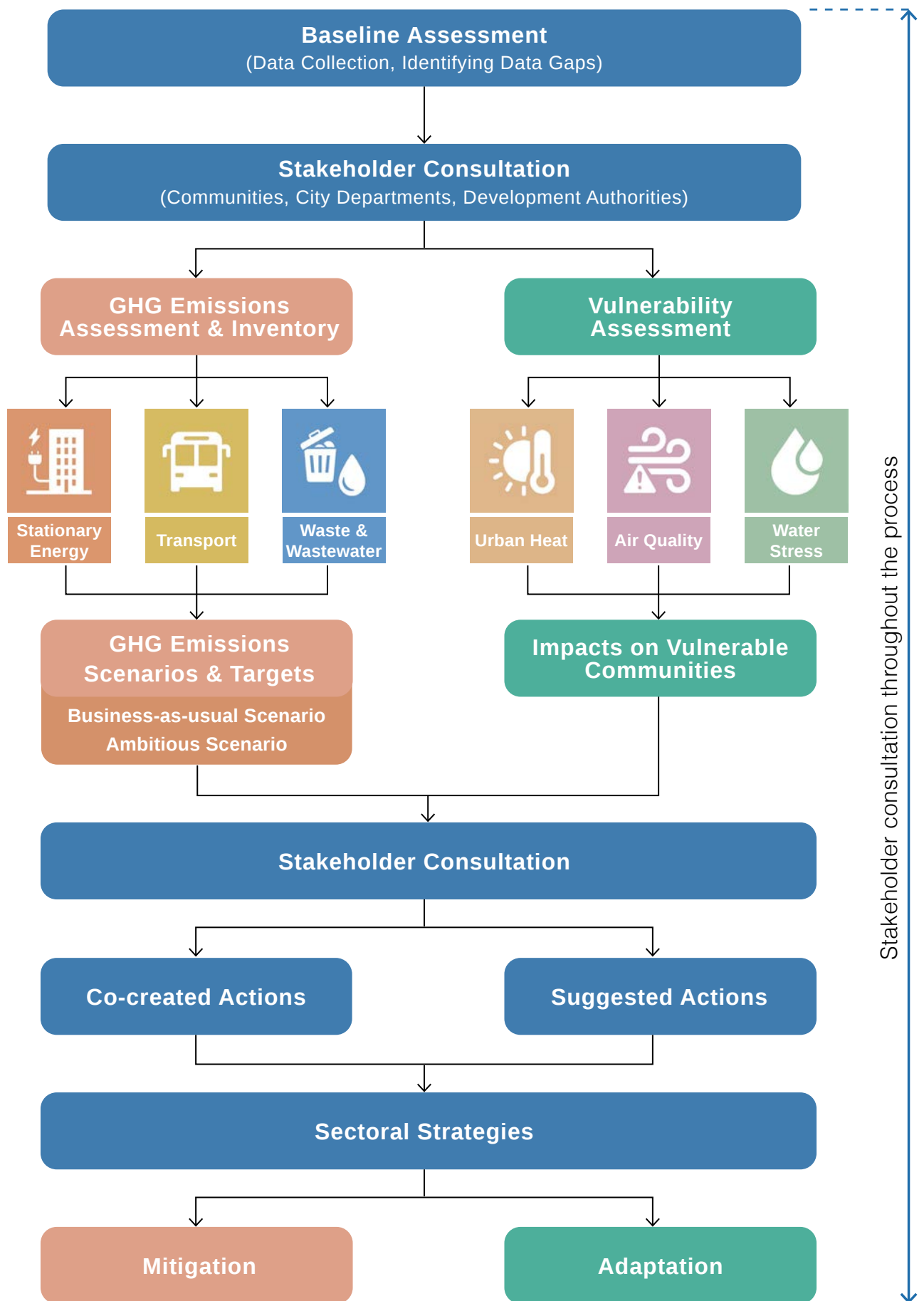


Figure 11: CAP process flow. (Source: MHT)



Consultation meeting with JCMC officials



Multi-stakeholder consultation



Stakeholder consultations



Consultation with Prabhag Samiti



Meeting with water department



Consultation with vulnerable community



Data collection

Figure 12: Stakeholder consultation through JCAP preparation (Source: MHT)

2.3 Assessment Framework

■ GHG Emissions Assessment Framework

The greenhouse gas emissions assessment for Jalgaon follows a locally developed approach following guidelines and methodologies specified by IPCC for urban greenhouse gas accounting and reporting. The inventory quantifies emissions of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), which are converted into carbon dioxide equivalent (CO₂e) using Global Warming Potential factors to provide a unified estimate of the city's emissions profile.

For Jalgaon, the assessment covers the major urban sectors that are most relevant to the city's emissions profile, namely stationary energy, transportation, and waste and wastewater. A contextualised inventory approach has been adopted to reflect actual local conditions and data availability, making the assessment more suitable for a tier-2 city context than standardised methods that depend on extensive datasets. The framework therefore supports a more practical and city-specific understanding of where emissions are generated, establishes the 2024 baseline for future comparison, and provides the analytical basis for mitigation scenarios, targets, and sectoral action tracks under the Jalgaon Climate Action Plan.

■ Vulnerability Assessment Framework

The vulnerability assessment for Jalgaon is informed by the framework of the Intergovernmental Panel on Climate Change (IPCC), which provides an internationally recognised basis for understanding how climate-related hazards translate into risk for cities, communities, and urban systems. In the urban context, this framework supports cities in assessing not only the presence of climate hazards, but also the conditions that influence the severity and distribution of their impacts. For Jalgaon, the framework has been used to assess the implications of key climate and environmental stresses, particularly urban heat, water stress, and air pollution, in relation to people, assets, infrastructure, and essential services across the city.

The assessment links hazard patterns with settlement conditions, service access, and broader socio-economic vulnerabilities in order to identify differentiated risk across urban areas and population groups. At the city scale, it considers the adequacy and distribution of essential services that shape the capacity of residents to respond to climate stress. At the local scale, it gives particular attention to informal settlements and other high-risk areas where environmental exposure intersects with limited access to water supply, sanitation, drainage, electricity, healthcare, and other basic services. This approach enables the CAP to capture the spatial and social concentration of climate risk and to support the prioritisation of adaptation measures within the municipal planning framework.



3. City Context

Jalgaon is the administrative headquarters of Jalgaon district and the main urban centre of the city region in North Maharashtra. Located within the wider Khandesh region, it holds an important position in the district's settlement structure and serves as a significant node in the region's agro-economy. Jalgaon also serves as an important railway junction, strengthening its role in regional connectivity, mobility, and exchange across surrounding settlements. The city's projected population for 2024 is about 6.51 lakh¹, representing roughly 0.5 percent of Maharashtra's projected population of 13.28 crore² making it the 20th largest city in Maharashtra. This scale positions Jalgaon as a medium-sized but regionally significant city within the state's urban system, with a growing role in regional administration, service delivery, and urban expansion.

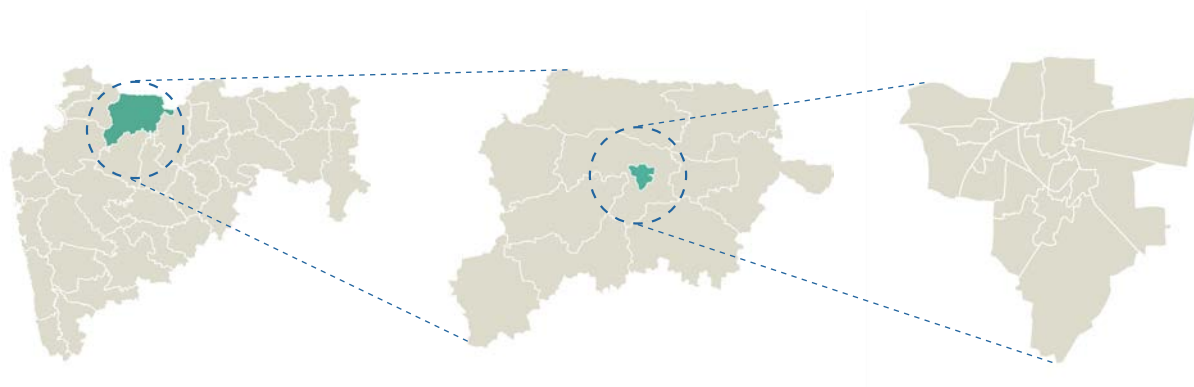


Figure 13: Location map - Maharashtra and Jalgaon. (Source: JCMC / OpenStreetMap)

Geographically, Jalgaon is located at approximately 21.00° North latitude and 75.56° East longitude in the northern part of Maharashtra.³ The city lies within an inland plain setting and has developed through a combination of older core areas, municipal expansion, and peripheral growth. Its jurisdiction extends over about 68.78 sq km and is administratively divided into 19 wards, reflecting a spatial structure that combines dense built-up areas with newly expanding neighbourhoods.⁴ The Girna River forms part of the broader hydrological context of the district, while the city's own spatial growth pattern reflects the influence of transport corridors, municipal infrastructure, and the outward extension of built-up areas.

Jalgaon also carries a distinct historical and cultural identity shaped by its long-standing settlement pattern, civic institutions, and neighbourhood-based social life. Within the city, places such as Mehrun Lake and the older market and civic precincts continue to contribute to its urban character and local identity. The city's urban form today reflects the coexistence of established localities, public and institutional spaces, and newer residential extensions that have emerged with recent growth. This layered urban structure is relevant to the Jalgaon Climate Action Plan because it influences how infrastructure deficits, service delivery gaps, and future climate actions need to be understood and addressed across different parts of the city.

1. Data received from JCMC

2. Census India projection

3. Survey of India and Government of Maharashtra GIS maps for Jalgaon city.

4. Jalgaon City Municipal Corporation, official area and ward boundaries for Jalgaon city.

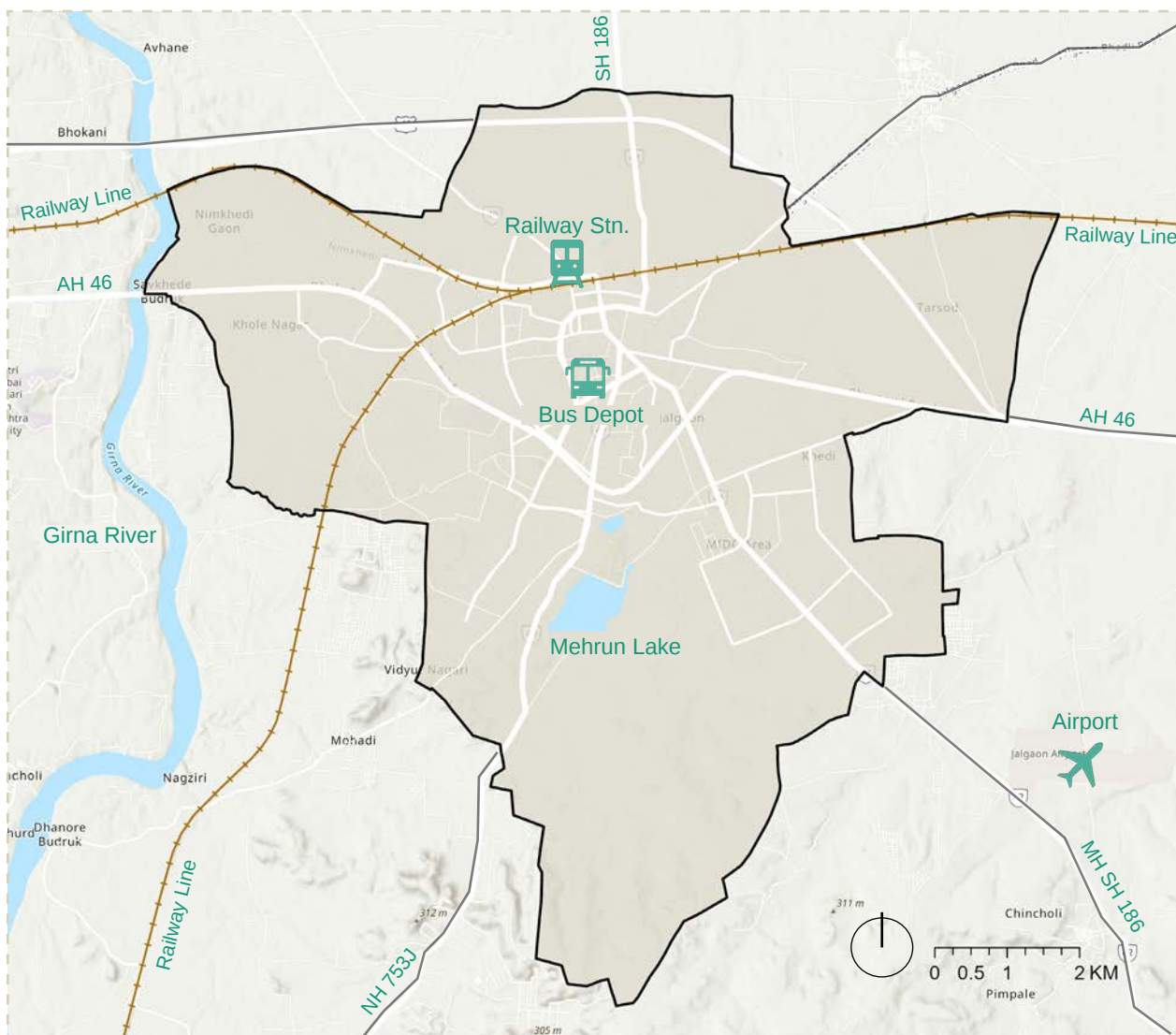


Figure 14: Jalgaon City Municipal Corporation boundary map. (Source: JCMC)

3.1 Connectivity



Airport

The city is served by Jalgaon Airport, located about 6 km from the city according to the district administration, providing domestic connectivity and improving regional access.



Railway

Jalgaon is an important railway junction with strong rail connectivity to major cities in Maharashtra and other parts of India, supporting both passenger movement and regional economic linkages.



Roadway

Through state transport services and the wider highway network, Jalgaon is connected with major cities in the states such as Mumbai, Pune, Nashik, Nagpur, Surat, and Indore

3.2 Demography



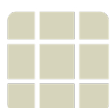
68.78 sq.km
JCMC Area 2024



6.51 lakh
Population 2024
(As per JCMC)



9,466 persons / sq.km
Population Density



Total 19 no. of Wards
in JCMC



1.44 lakh
No. of Households (4.5 as
average household size)



28,280
Slum Population
(Census 2011)

According to Census 2011, Jalgaon city had a population of 4,60,228. Of this, the literacy rate was 87.28%, the sex ratio was 913 females per 1,000 males, and children in the 0-6 age group numbered 53,086, accounting for approximately 11.53% of the total population.³ Between 1981 and 2011, the city's population increased from 1,45,335 to 4,60,228, reflecting an overall growth of about 216.7% over three decades.⁴ This growth may be understood in the context of Jalgaon's continued urban expansion, its administrative importance, and the concentration of services and institutions within the city.

The city is administratively divided into 19 wards, which serve as the basic units for municipal planning and service delivery. Jalgaon's projected population for 2024 is about 6.51 lakh. The city also has a slum population of 28,280 as per Census 2011. This demographic profile is important for the JCAP because it reflects both overall urban growth and the presence of population groups that may face greater climate vulnerability due to service and infrastructure deficits.

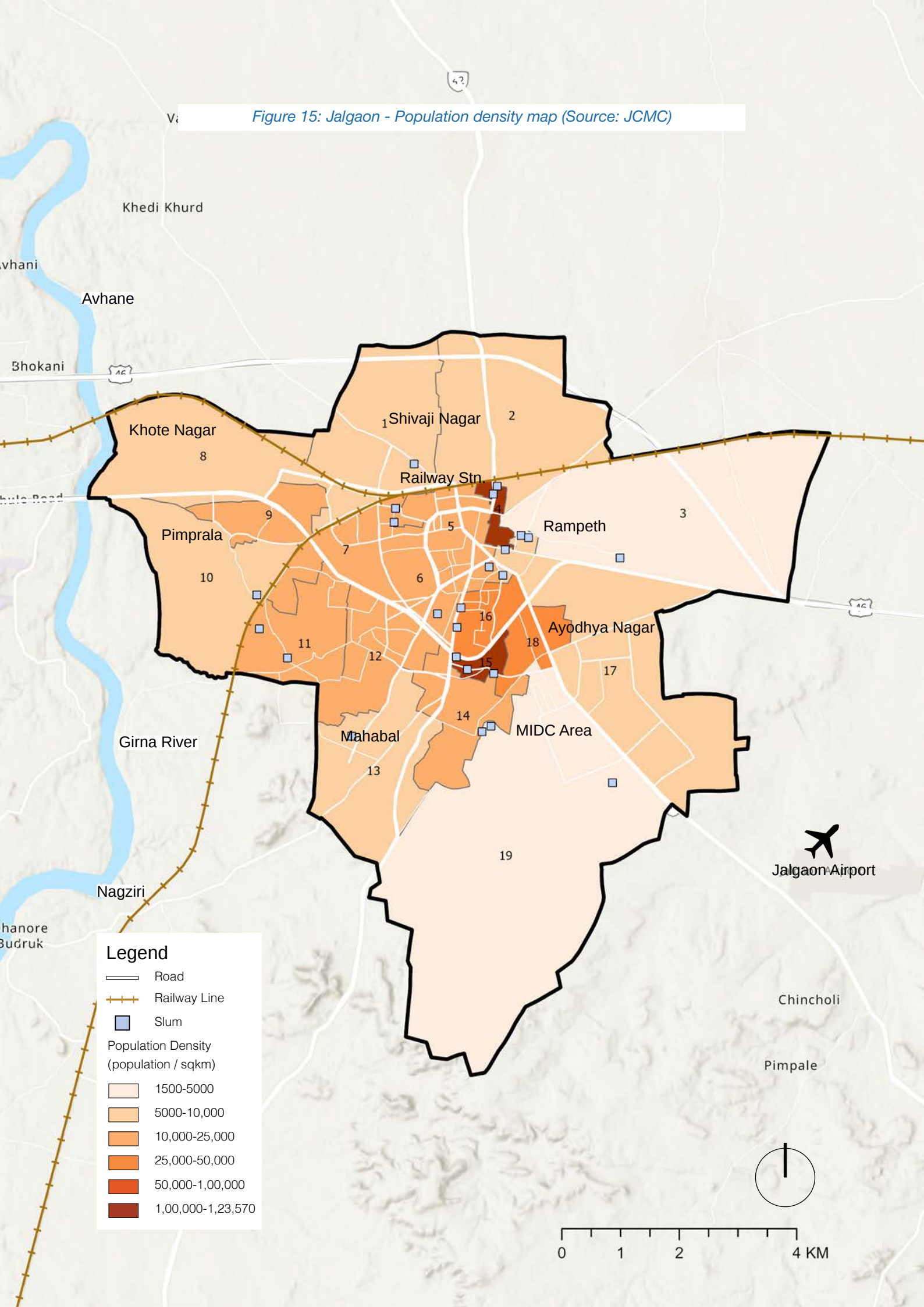
Table 1: Jalgaon growth rate in population (Source: Census 2011)

Year	Population	Decadal Growth Rate
1981	1,45,335	36.2
1991	2,42,498	66.6
2001	3,68,618	52.2
2011	4,60,228	24.9

5. Census of India 2011, Jalgaon City.

6. Census of India 1981, 1991, 2001 and 2011, urban population data for Jalgaon.

Figure 15: Jalgaon - Population density map (Source: JCMC)



3.3 Spatial Growth Pattern

Jalgaon's built-up area has grown over the past decade through a combination of peripheral growth and infill development within older urban areas, as shown in Figure 17. This pattern indicates development both within the existing urban fabric and on the city fringe, with growth concentrated along the eastern and western corridors and comparatively limited expansion in the southern part of the city.

Figure 16 further shows that built-up growth remained relatively uniform between 2010 and 2020, while it declined during the 2020-2025 period. This trend suggests a slowdown in the pace of development in the later years, even as growth continued in select locations. As built-up areas increase, pressure on infrastructure, drainage, mobility, and municipal service networks also rises, particularly in areas where service provision may lag behind development. The spatial distribution of built-up area therefore provides a useful picture of how the city is evolving spatially and where future development pressure is likely to concentrate.

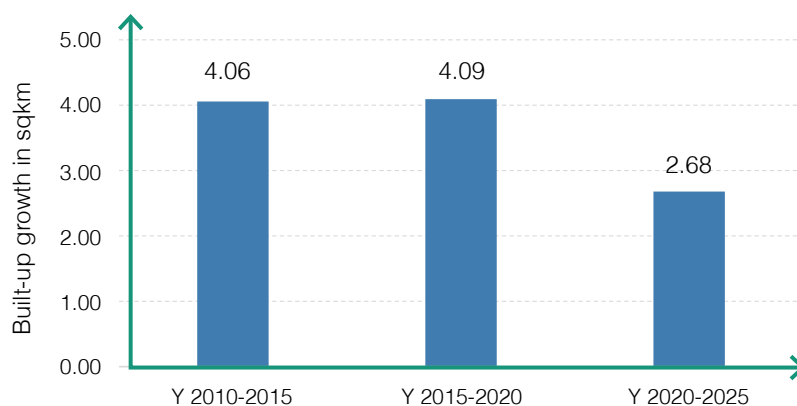


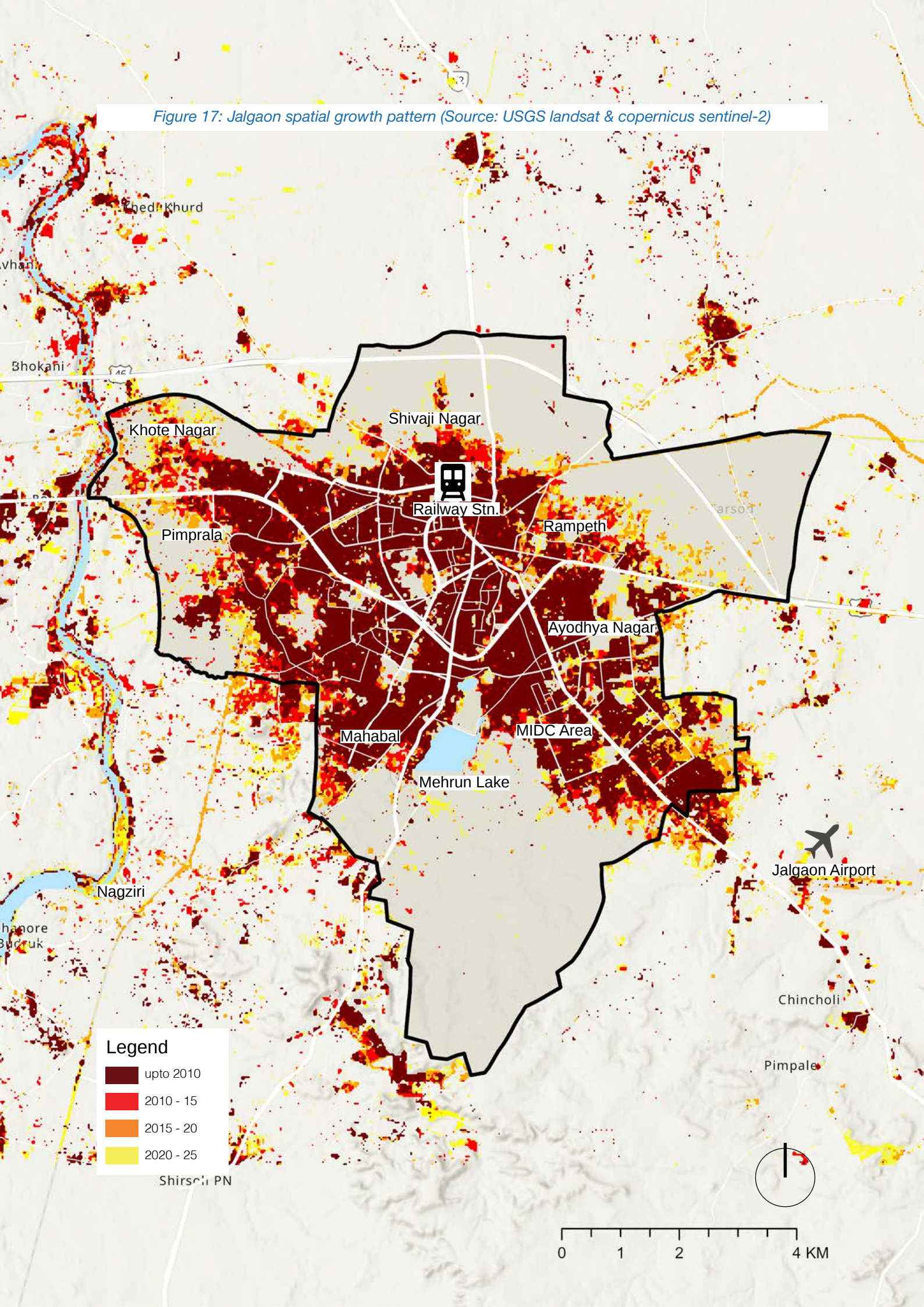
Figure 16: Built-up area growth trends in Jalgaon (Source: USGS landsat & copernicus sentinel-2)

3.4 Economic Activities

Jalgaon functions as an important economic centre in North Maharashtra, with its urban economy rooted in agriculture, trade, and industry. The district is widely recognised for banana production, and Jalgaon banana has received Geographical Indication recognition, strengthening its identity within the state's horticultural economy.⁵ This agricultural base supports related activities such as aggregation, packaging, storage, transport, and value-added processing, making the city an important node in agro-commerce. The city also has a diversified industrial base, including textiles, agro-processing, and small and medium enterprises. Recent investment commitments and planned industrial development point to continued economic expansion in the Jalgaon urban region. This reinforces the need for urban growth to be matched with stronger infrastructure, service delivery, and resource management.

7. Geographical Indications Registry, Jalgaon Banana GI certification.

Figure 17: Jalgaon spatial growth pattern (Source: USGS landsat & copernicus sentinel-2)



3.5 Climate Context

Jalgaon has a semi-arid climate marked by strong seasonal variation in temperature and a heavy dependence on monsoon rainfall.⁶ The city experiences long dry periods, hot summers, and a short rainy season, which together shape its environmental conditions and place pressure on water availability, public health, drainage, and basic services. These climatic characteristics make Jalgaon sensitive to both temperature extremes and uneven rainfall, with direct implications for urban planning and resilience.

The city is also affected by rising temperatures, recurrent heat extremes, rainfall variability, and water stress. These conditions matter because they interact with infrastructure gaps and uneven service access, making some areas more exposed than others. Jalgaon's climate profile is therefore not just a background condition, but a key factor shaping vulnerability, resilience planning, and long-term development priorities.



Precipitation

Jalgaon receives an average annual rainfall of approximately 778.52 mm, with the bulk of precipitation concentrated during the southwest monsoon season from June to September.⁷ August and September are typically the wettest months, showing a strong seasonal concentration of rainfall and a relatively narrow window for groundwater recharge and surface water replenishment.⁷ This pattern makes the city particularly sensitive to monsoon variability, delayed rainfall, and drought years. Because rainfall is concentrated within a short period, even small changes in its timing or intensity can affect water security and local drainage conditions, making precipitation an important factor in long-term climate planning.



Temperature

Jalgaon experiences a wide seasonal temperature range, with very hot summers and relatively cool winters. Peak summer temperatures rise to about 45.3°C, while winter temperatures can fall to around 4.7°C, showing the extent of thermal variation across the year.⁸ Under normal climatic conditions, temperatures generally remain between 11.1°C and 41.5°C, which indicates that heat is a recurring and significant part of the city's climate profile.⁸

Long-term records from 1983 to 2023 show that Jalgaon's average annual temperature has generally stayed in the range of 25.8°C to 27.2°C, but the more important change is

6. India Meteorological Department (IMD), Jalgaon station climate classification and long-term records.

7. India Meteorological Department (IMD), Jalgaon rainfall records and monthly climatology (long-term station data).

8. India Meteorological Department (IMD), Jalgaon temperature records and climatological normals (long-term station data).

the rise in sustained heat exposure.⁹ The average number of days exceeding 40°C has increased significantly over time, rising from 39.4 days in 1985-1994 to 48.2 days in the most recent decade.⁹ This suggests that extreme heat is becoming more persistent, with important implications for public health, outdoor labor, water demand, and the strain placed on urban infrastructure.

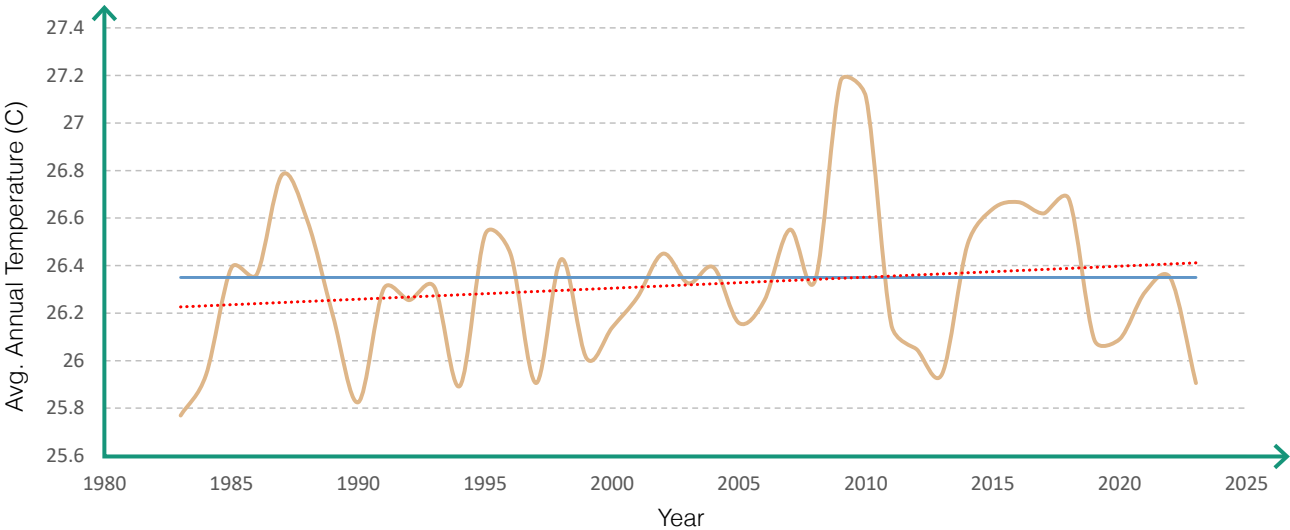


Figure 18: Average annual temperature in Jalgaon (1983–2023) with linear trend (Source: IMD / IMDWEB)

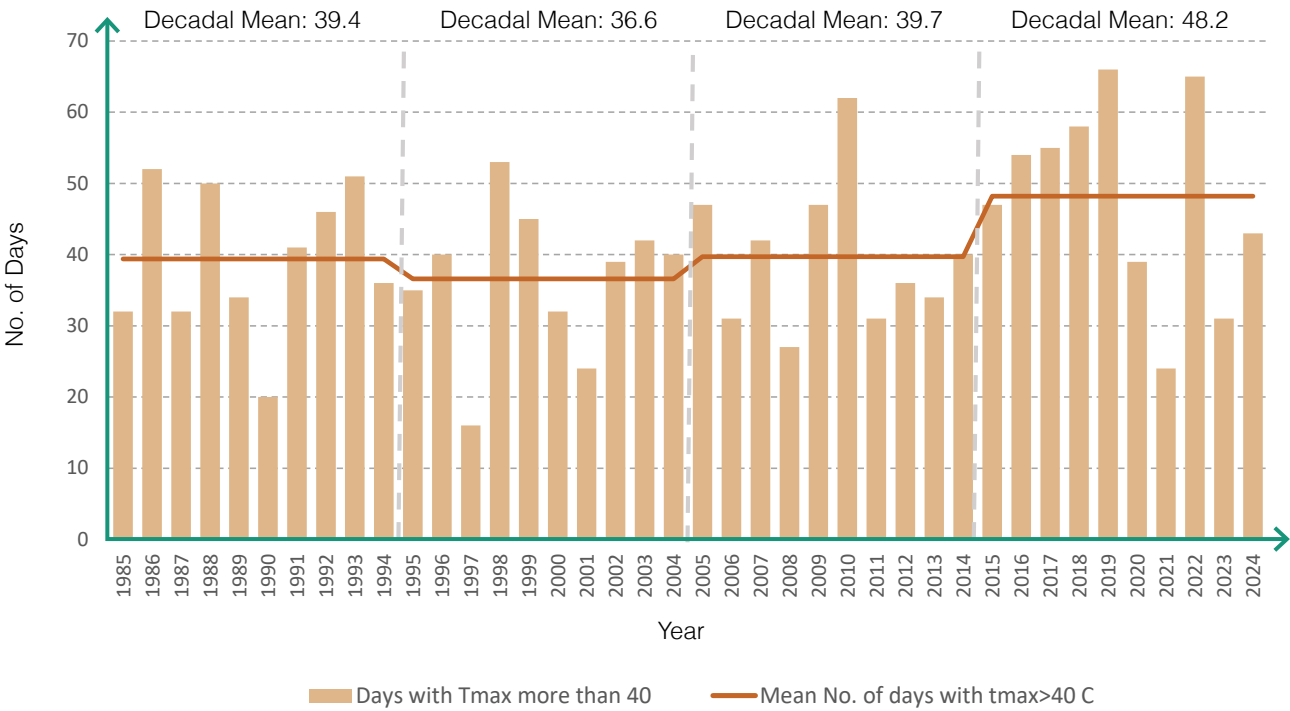


Figure 19: Annual days with Tmax > 40°C in Jalgaon (1985–2023) (Source: IMD / IMDWEB)

9. JCMC and MHT analysis of IMD Jalgaon station data, 1983-2023.

The JCAP uses CMIP6-based Shared Socioeconomic Pathway scenarios (SSPs), which present different possible future development and emissions pathways. These scenarios show how temperature may change under different climate futures. For Maharashtra, the projections indicate continued warming over the century, with average temperature rising to about 27°C under SSP1-1.9, around 29°C under SSP2-4.5, and nearly 31°C under SSP5-8.5 by the end of the century. These projections reinforce the need for Jalgaon to integrate heat resilience, water security, and climate-responsive planning into its long-term urban development strategy.

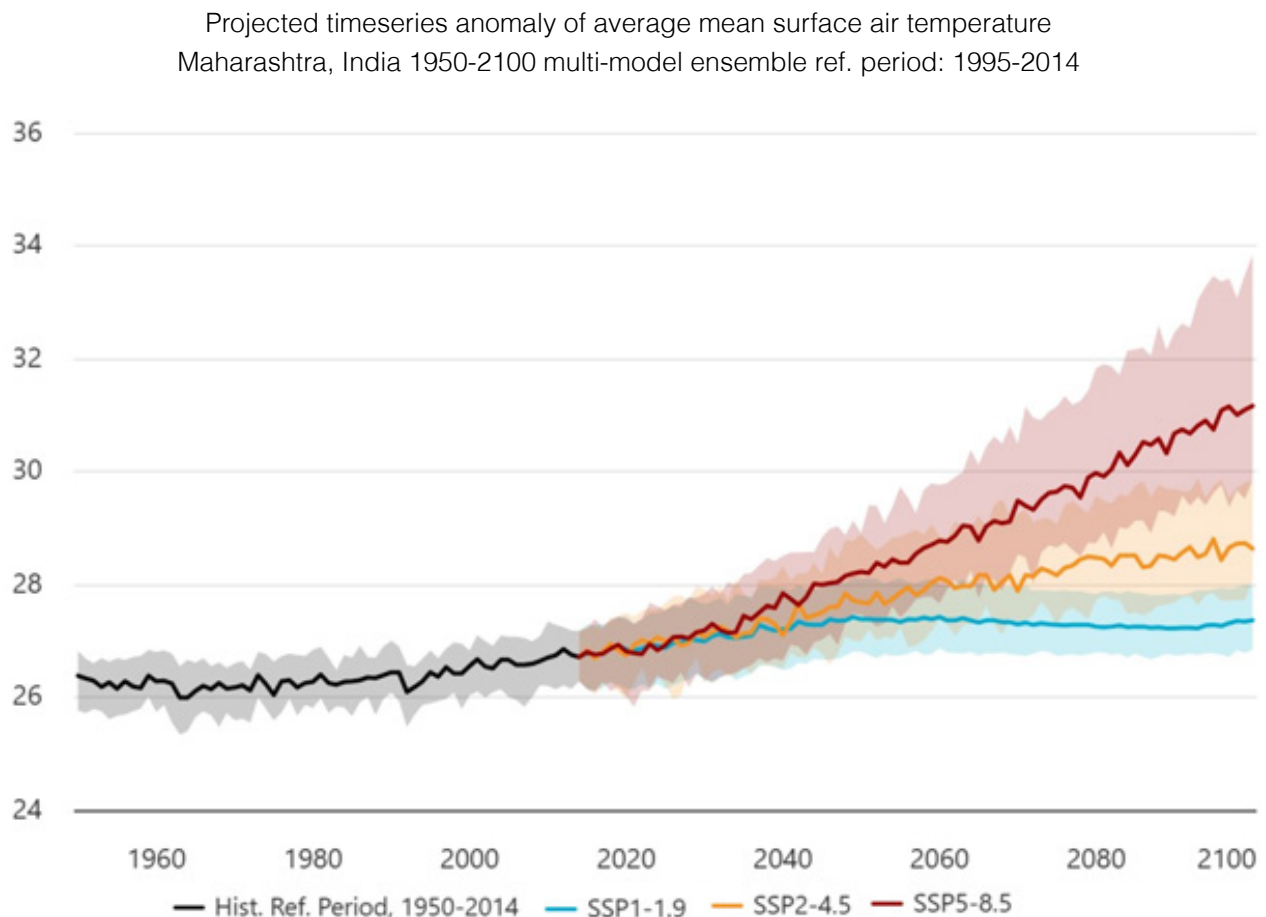


Figure 20: Change in average mean surface air temperature, Maharashtra 1950–2100 (Multi-model ensemble, CMIP6) (Source: CMIP6 / Maharashtra climate cell)

SSP1-1.9: Represents a low-emissions scenario representing strong mitigation efforts and the lowest level of future warming.

SSP2-4.5: Represents an intermediate scenario representing moderate mitigation action and moderate warming.

SSP5-8.5: Represents a high-emissions scenario representing limited mitigation and the highest level of future warming.



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3.6 Development Plan of Jalgaon

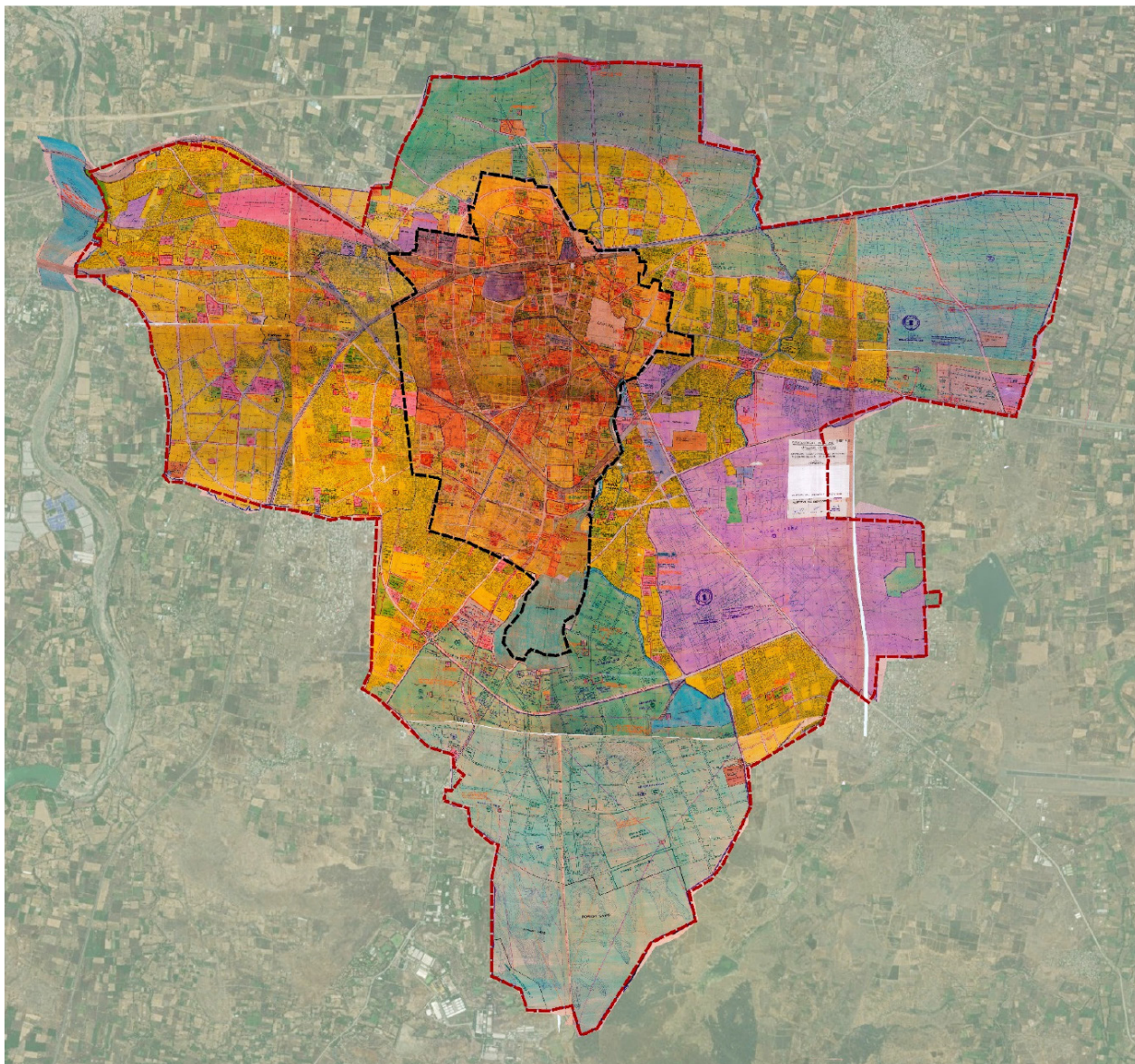


Figure 21: Development plan of Jalgaon showing the expanded planning area (Source: JCMC)

Jalgaon's development plan Figure 21, published in 2002, marked a statutory revision of the earlier planning framework in response to the city's changing spatial structure and development requirements. The earlier development plan Figure 22 primarily covered the core urban area, now known as June Jalgaon or the old city, which represents the historic nucleus of the settlement. This planning boundary reflected a compact urban form, with development concentrated largely within the established city fabric.

Jalgaon's development plan extends beyond the original core area into peripheral zones experiencing increasing urbanization pressure, reflecting a shift from a compact boundary to a broader statutory framework. This revision accommodates future growth

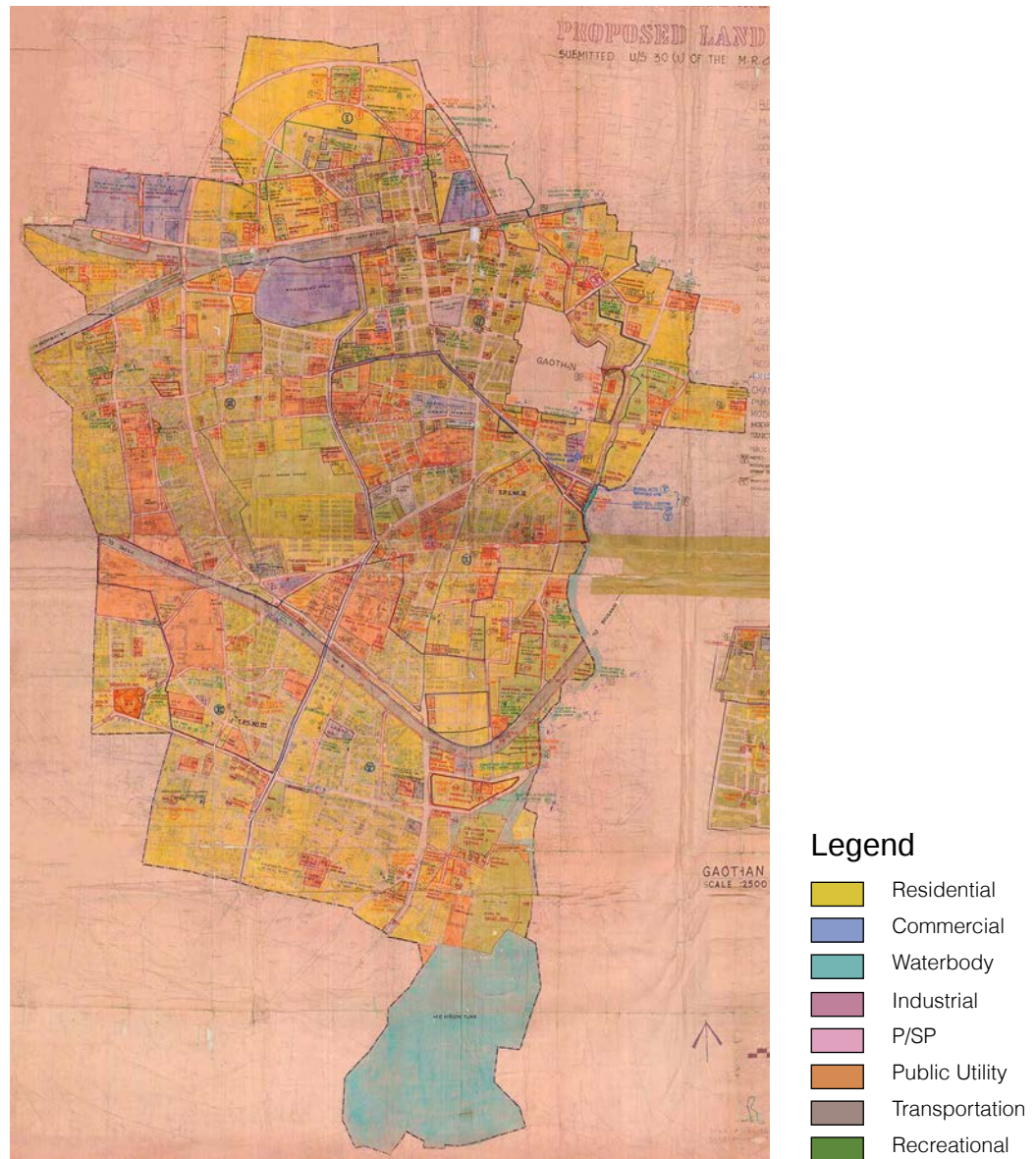


Figure 22: Development plan of Jalgaon showing the old planning area (Source: JCMC)

corridors, infrastructure requirements, and changing land-use patterns, while capturing both intensification within the old city and outward expansion into surrounding areas. The development plan therefore functions as an important policy instrument for land-use regulation, infrastructure coordination, and reservation protection across the municipal area. However, the plan analysis also indicates limited attention to the conservation of green and blue assets. The Girna River lies outside the municipal extent, leaving no direct planning intervention for its protection, while features such as Mehrun Lake were included only in the earlier planning of the old city. Several reservations for parks and open spaces have also been converted to other uses. These aspects underline the need to examine the institutional and financial framework for implementation.

3.7 Institutional Structure & Municipal Budget

Jalgaon City Municipal Corporation (JCMC) is the principal urban local body responsible for civic administration, infrastructure provision, and municipal service delivery within Jalgaon city. The corporation functions through a political wing led by the Mayor and an administrative wing headed by the Municipal Commissioner, supported by departmental structures responsible for governance, finance, infrastructure, health, environment, and emergency response. In the context of JCAP, these institutional arrangements are particularly important because implementation is expected to be carried out through existing departmental systems and inter-agency coordination rather than through a separate climate authority.

Figure 23, Organogram of JCMC departments & stakeholders relevant to JCAP, presents the institutional framework through which climate-related actions are to be coordinated and implemented. The organogram is intended to steer climate action planning, facilitate the implementation of mitigation and adaptation measures, and support impact monitoring through key performance indicators across relevant departments and partner institutions. This approach is consistent with the JCAP, which assigns responsibilities to JCMC departments along with state agencies and implementation partners for sectoral actions in energy, transport, solid waste, heat adaptation, and water and sanitation. The institutional approach in Jalgaon is centred on municipal leadership, departmental coordination, and stakeholder participation, including support from agencies such as MSEDCL, MIDC, MPCB, the Regional Transport Office, Public Works Department, and Mahila Housing Trust (MHT).

Municipal Budget: The main sources of budget for JCMC include¹⁰:

1. Tax revenue: From property tax, trade licences, and other local taxes.
2. Non-tax revenue: Fees, user charges, rents, penalties, and other municipal services.
3. State and central grants: Funds received from the government for general operations or specific works.
4. Shared revenue: A share of taxes collected by the state and passed on to JCMC.
5. Scheme funds: For government programmes and approved development works.
6. Project funds: For specific infrastructure or service projects.

Financial Year	Municipal Budget
2023 - 2024	886.75 cr
2024 - 2025	981.47 cr
2025 - 2026	1,247 cr



10. JCMC, Annual Budget Documents and Finance Department Notes.

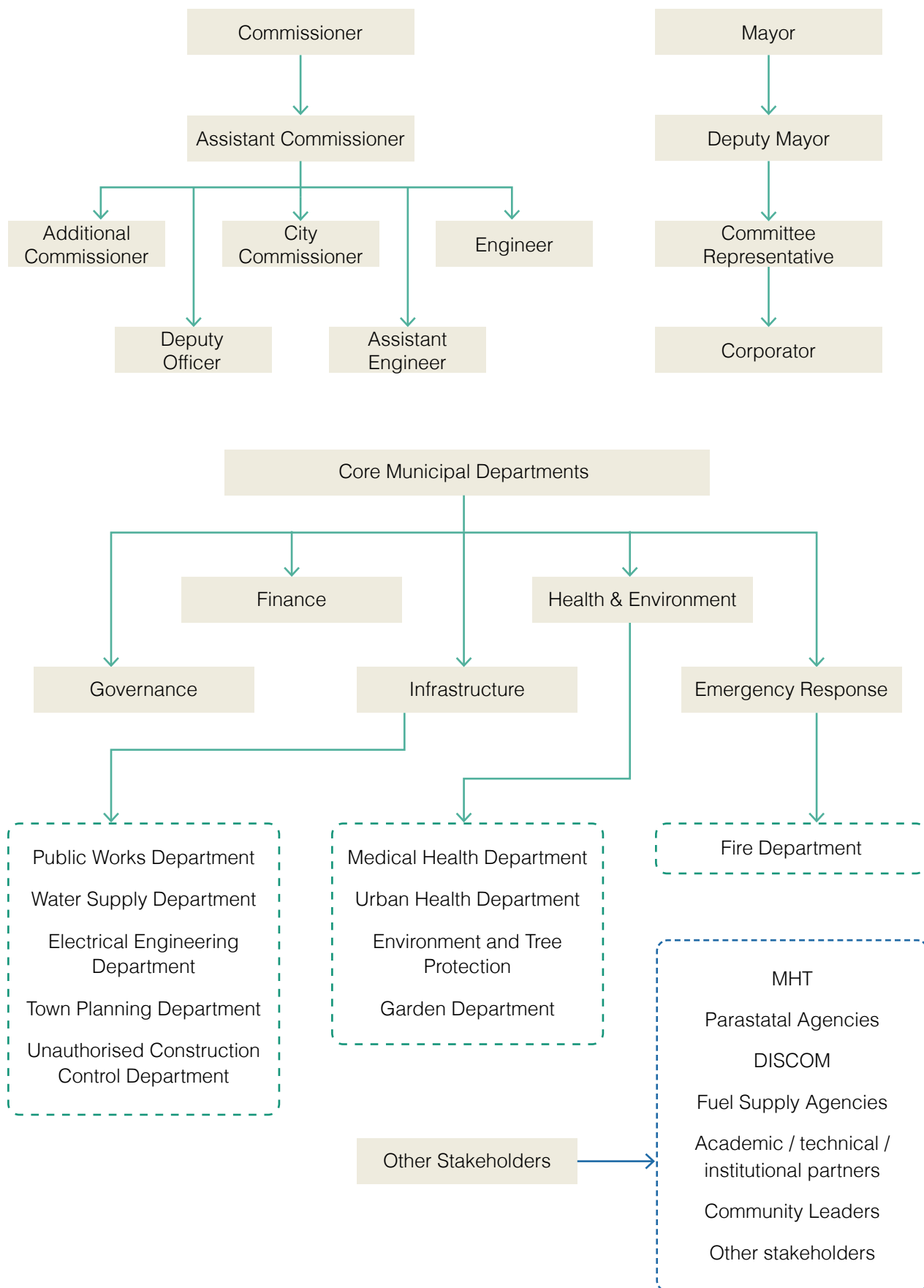
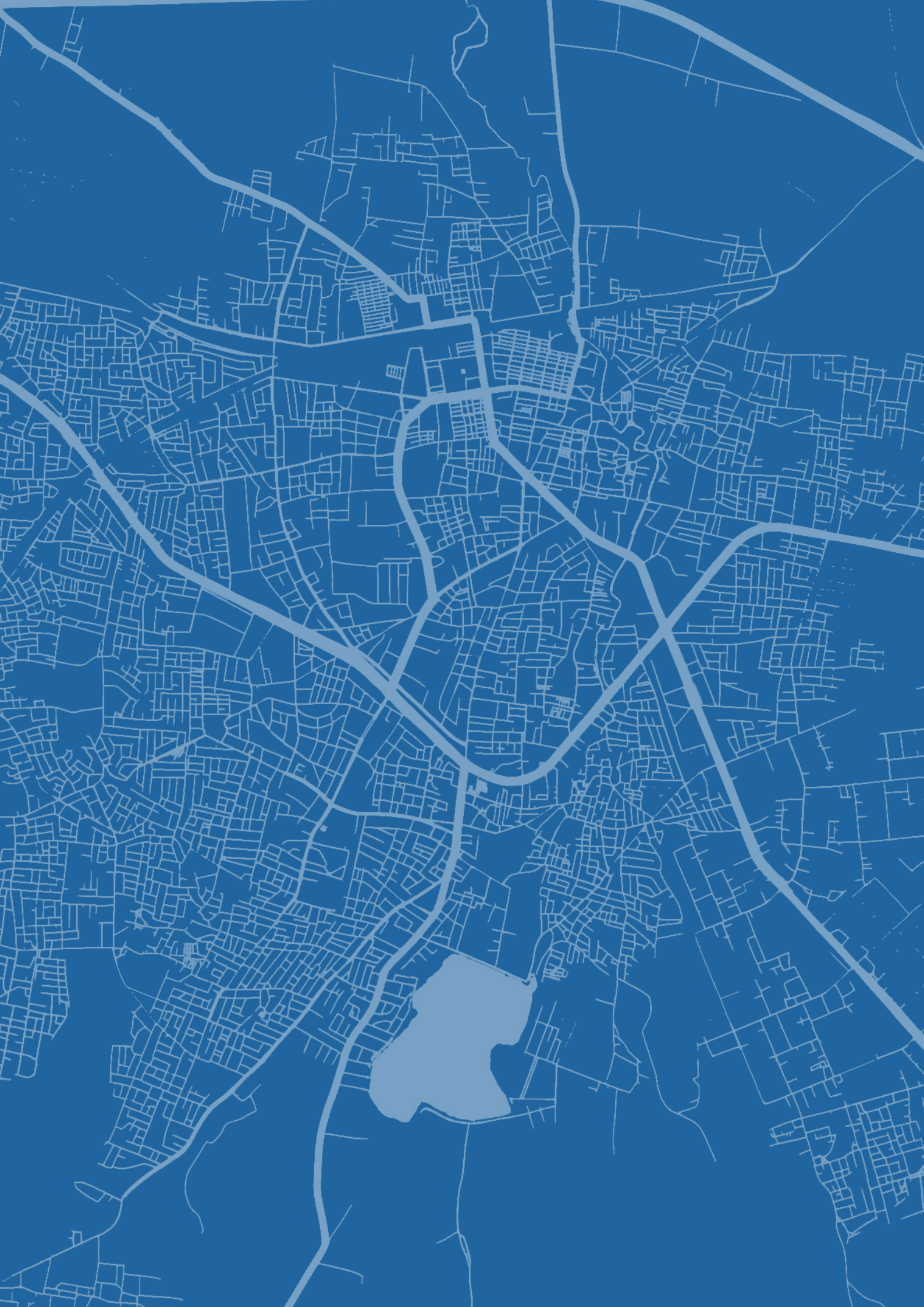
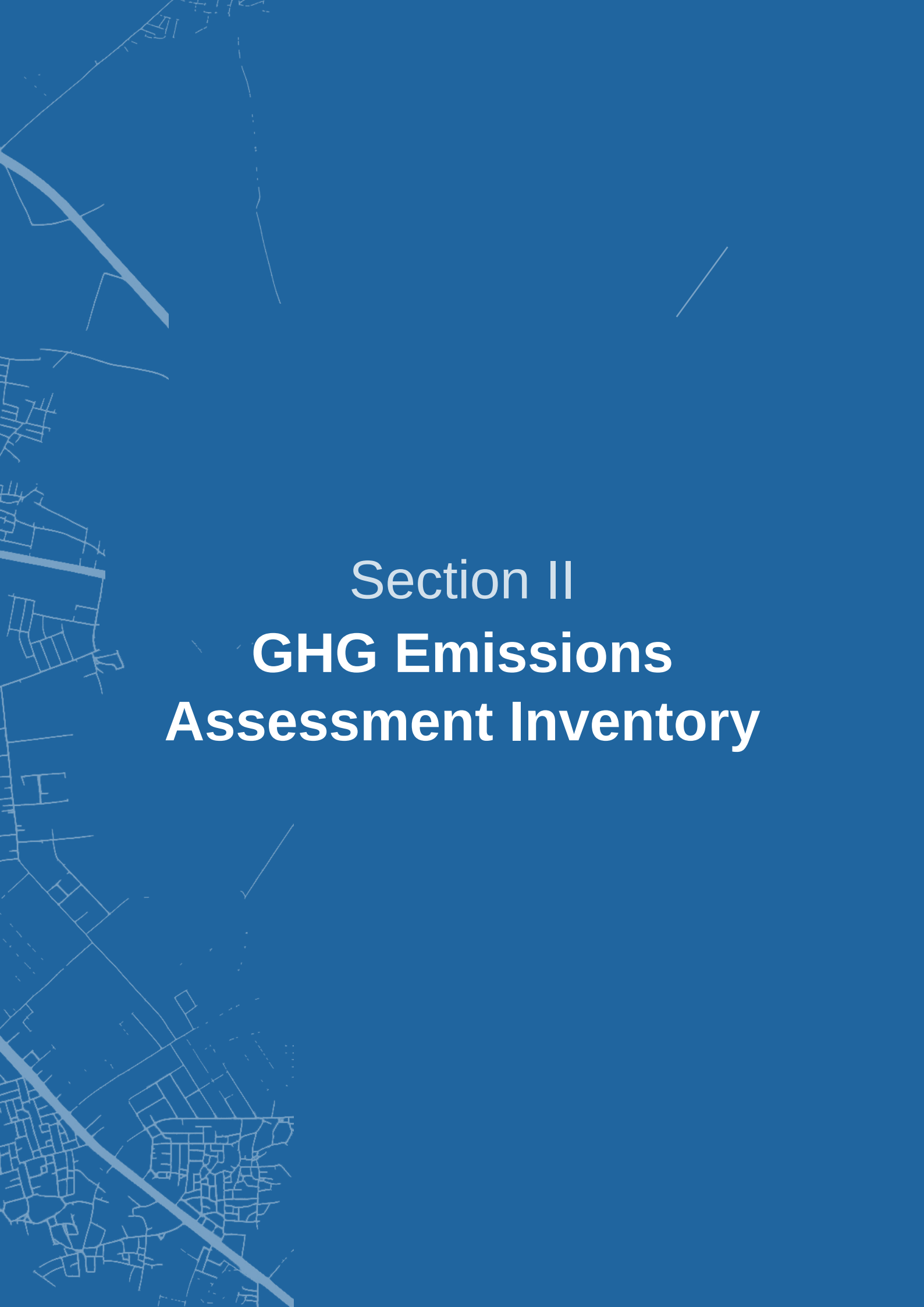


Figure 23: Organogram of JCMC departments & stakeholders relevant to JCAP. (Source: JCMC)





Section II

GHG Emissions Assessment Inventory

4. GHG Emission Assessment

The GHG emissions inventory for Jalgaon city (JCMC area) has been prepared for the base year 2024. The emissions inventory has been prepared following the IPCC methodologies for calculating greenhouse gas emissions and its database for emission factors of all fuels.

For Jalgaon, a more customized approach was implemented to reflect local conditions, activities, and available datasets. This localized strategy provides a more precise emissions inventory than standard climate action plans generated by global agencies. Those conventional tools largely depend on extensive datasets that are typically unavailable in Tier 2 cities and towns of India.

This approach simplifies the GHG inventory process by allowing data entry in units used by the departments of city. This pragmatic approach better reflects the local conditions and is more suitable to arrive at the actions and strategies for adaptation and mitigation.

This approach also enables Jalgaon city officials to conduct regular, long-term emissions monitoring beyond the CAP's completion, ensuring a highly action-oriented plan. Data sets have been collected from the respective departments of the city through stakeholder consultations and primary data collection on site.

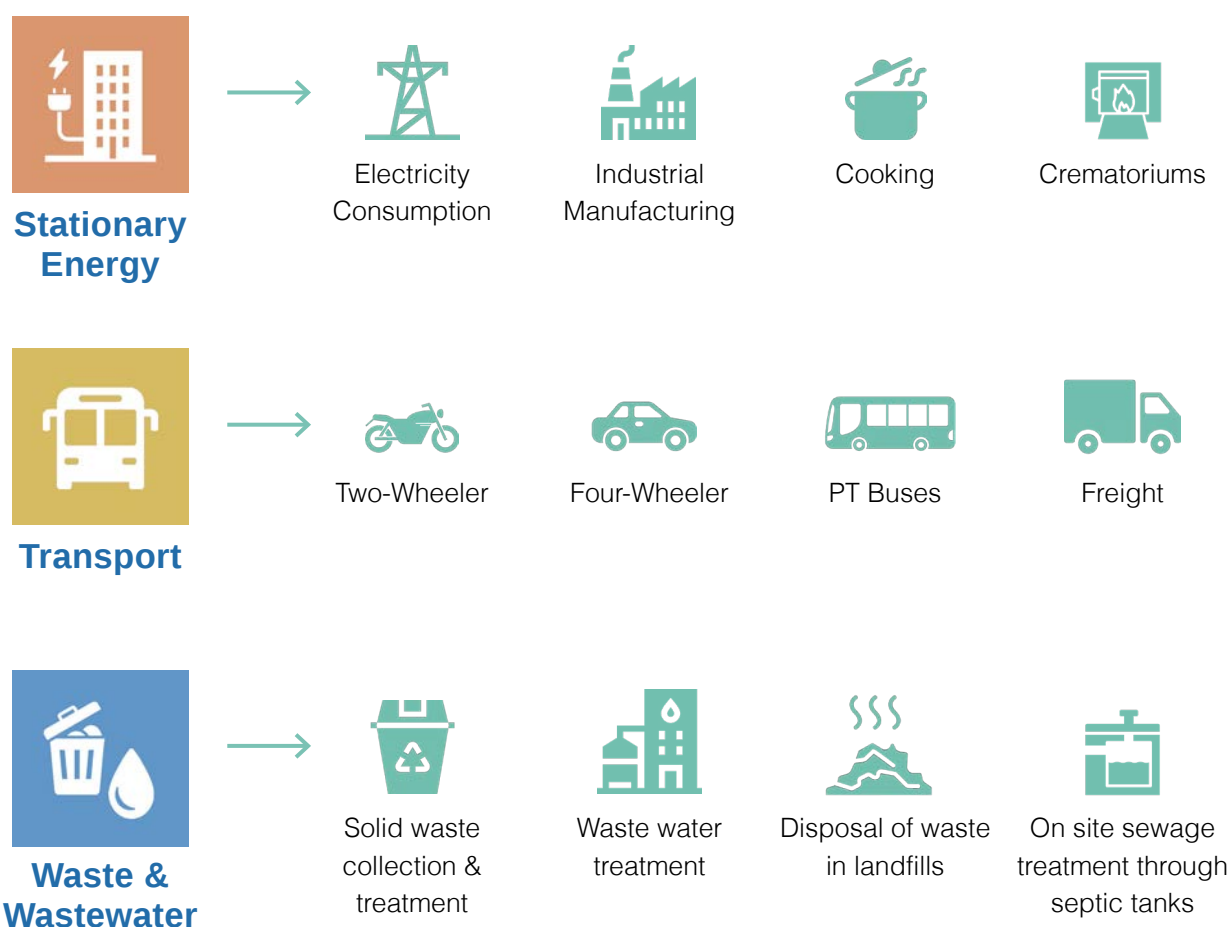


Figure 24: Greenhouse gas emission profile of Jalgaon: Sectors and associated activities (Source: MHT)

The inventory of GHG emissions in Jalgaon focuses on the computation of emissions from fuel combustion happening within the building as well as emissions happening outside of the city’s administrative boundaries but are consequences of direct energy consumption for the activities in the city (for example: emissions generated in the production of electricity, which is used in the city). The emissions inventory calculates the greenhouse gases: carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), and converts them into carbon dioxide equivalent (CO₂e) using Global Warming Potential factors.

4.1 Methodology

Gases that trap heat in the atmosphere are called greenhouse gases. These gases—such as carbon dioxide, methane, and nitrous oxide—trap heat radiating back from the Earth’s surface after it absorbs sunlight. This trapped heat increases the Earth’s overall temperature, leading to global warming. Various human activities, particularly urban energy consumption, transportation, and industrial processes, heavily contribute to these emissions. Because each gas absorbs energy differently, they all have distinct Global Warming Potentials (GWP). To accurately estimate these impacts, the GWP values outlined by the IPCC in its Fifth Assessment Report (AR5) published in 2013 have been referred for the emissions inventory.

Table 2: 100 years of GWP for greenhouse gas emissions with respect to CO₂ (Source: IPCC AR5)

Gas	Global Warming Potential for 100 years (kg CO ₂ e) (100-year time-horizon)
CH ₄	28
N ₂ O	265

To calculate greenhouse gas emissions from fuel combustion, the specific fuel’s emission factor is multiplied by its consumption data for Jalgaon 2024 horizon year.

Total GHG Emissions = $\sum$ GHG_{Sectors}

GHG_{Sector} = Activity data of Sector (2024) x Emission factor (for that fuel)

Emission factors are sourced sector-wise from the IPCC database, ensuring standard compliance with the GHG Protocol. For example- the emission factor for petrol varies depending on its application, differing between stationary energy combustion and mobile transportation. The emission factor for electricity has been considered as the Indian average national grid emission factor calculated and published by Central Electricity Authority. It usually differs based on the grid mix, fuel used and efficiency of electricity generation for that area.

To compile sector-wise fuel consumption activity data in Jalgaon (2024), the MHT team conducted comprehensive data collection. Due to data constraints, the direct emissions from agriculture, land use change, and forestry sectors have not been included in the analysis. The following Table 3 lists all the data sets collected for the emissions inventory and their sources.

Table 3: List of sector-wise datasets collected from departments for emissions inventory (Source: MHT)

Sr. no	Data Set	Source	Notes / Methodology of Data Collection
Stationary Energy			
1	Electricity	Maharashtra State Electricity Distribution Company Limited (MSEDCL)	Stakeholder Consultation
2	LPG	Collector Office	
3	Wood	Forest conservation department, Saw Mill (Primary data), Slum (Primary data)	
4	Fuel combustion in Industries	Maharashtra Pollution Control Board (MPCB), Maharashtra Industrial development Corporation (MIDC)	
5	Fuel combustion in Crematoriums	Health department, JCMC	
Transportation			
1	Petrol/Diesel	Nayara Logistics Private Limited, Indian Oil Corporation Limited (IOCL), and Hindustan Petroleum Corporation Limited (HPCL)	Primary data was collected from all petrol pumps of the city to estimate the total fuel consumption for transportation in Jalgaon for 2024
Solid Waste Management			
1	Source segregation data	Waste department, JCMC	Stakeholder Consultation
2	Waste composition data	Waste department, JCMC	
3	Solid waste collection data	Waste department, JCMC	
Waste Water Management			
1	Waste water treatment data	Sewage Treatment Plant, Jalgaon, Water supply department- JCMC	Stakeholder Consultation



Emissions from Stationary Energy

The stationary energy sector includes emissions from fuel and electricity consumption in residential, commercial, public and institutional, industrial, and crematorium sub-sectors. The assessment also covers emissions associated with key public utilities such as water supply systems, sewage treatment plants, and water works. It also includes emissions from residential and commercial buildings due to cooking and heating with fuels like LPG and firewood. Data for this sector were compiled from Maharashtra State Electricity Distribution Company Limited (MSEDCL) for electricity consumption, the Forest Department for residential firewood, JCMC for LPG connections including PMUY, MPCB and MIDC for industrial fuel use, and the Health Department for crematorium fuel.

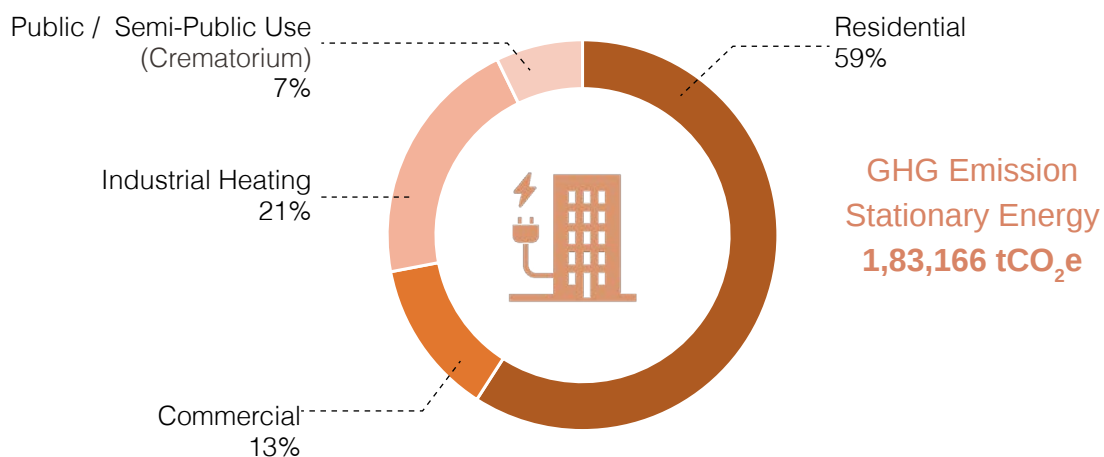


Figure 25: Stationary energy sector breakdown (pie chart) (Source: MHT GHG inventory approach, 2024)

In 2024, emissions from the stationary energy sector were estimated at 1,83,166 tCO₂e, making it the largest contributor (41%) to Jalgaon's total emissions profile. This sector is primarily driven by industrial activities—specifically manufacturing process-related fuel combustion and electricity consumption. This industrial baseline is closely followed by everyday urban energy demand, including electricity consumption and cooking or heating across residential and commercial buildings.

A key feature of this profile is that emissions are distributed across both industrial manufacturing and household uses, indicating that mitigation cannot rely on a single intervention. City-level strategies must address the entire spectrum of demand: targeting industrial efficiency and clean power sources, while simultaneously improving appliance efficiency, building performance, and access to cleaner end-use energy systems across all commercial and residential establishments.



Emissions from Transport

The transportation sector assessment covers emissions from fuel combustion in on-road vehicles operating within the city. For this analysis, city-level petrol and diesel consumption data were compiled from major fuel suppliers, including Nayara Logistics Private Limited, Indian Oil Corporation Limited (IOCL), and Hindustan Petroleum Corporation Limited (HPCL), and were used to estimate emissions across vehicle categories. This approach enables a city-specific assessment of transport-related fuel use and its contribution to the overall emissions profile.

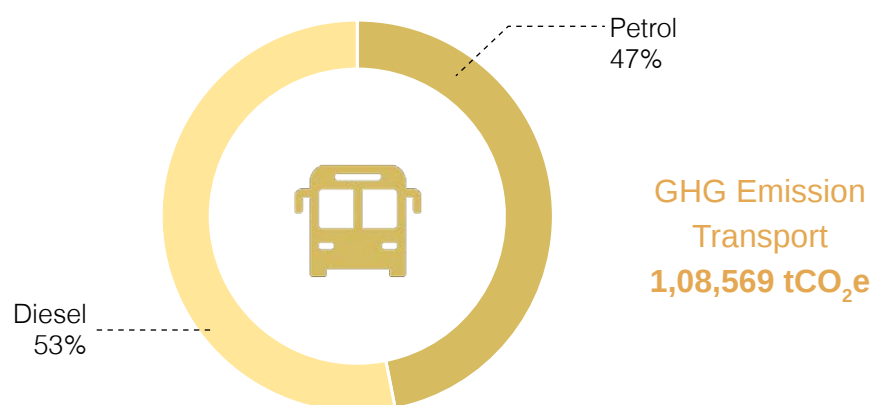


Figure 26: Transport sector emission breakdown (pie chart) (Source: MHT / Fuel supplier data, 2024)

Transport emissions in Jalgaon are estimated at 1,08,569 tCO₂e in 2024 which is 24% of the total GHG Emissions. Diesel-powered vehicles account for the larger share of these emissions at 53%, while petrol-powered vehicles contribute 47%. The sector profile also indicates the dominance of private vehicles in the city's transport mix, underscoring the need for cleaner mobility options, modal shift, and gradual electrification.

Jalgaon's transport emissions reflect a mobility system that remains heavily dependent on fossil-fuel-based road travel. The relatively high share of diesel suggests the presence of freight movement, commercial transport, and higher-usage vehicles, while petrol use indicates the use of private two-wheelers and cars in daily travel.

This pattern shows that transport emissions are shaped not only by the number of vehicles, but also by travel behaviour, trip lengths, and the city's present mobility structure. As urban development spreads outward, transport demand is likely to rise further unless supported by efficient public transport, safer walking and cycling networks, and measures that reduce dependence on private motorized travel. Therefore, transport mitigation in Jalgaon requires both cleaner vehicle technologies and planning interventions that can gradually shift the city toward a more efficient mobility system.



Emissions from Waste & Wastewater

The waste and wastewater sector includes emissions from solid waste disposal and wastewater treatment processes. Emissions from dumpsites, landfill conditions, and treatment systems were assessed using data obtained from the Health Department and Water Department of JCMC. This sector is particularly important in Jalgaon because unmanaged or partially managed waste systems can generate substantial methane emissions over time.

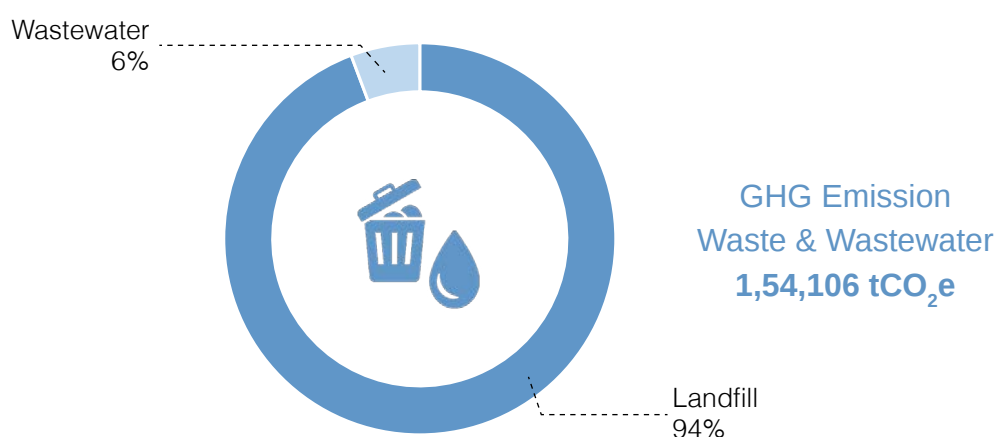


Figure 27: Waste & Wastewater sector emission breakdown (pie chart) (Source: MHT / Health dept., JCMC, 2024)

Jalgaon's waste and wastewater sector generated an estimated 1,54,106 tCO₂e in 2024 which is 35% of the total GHG emissions. Solid waste disposal drives 94% of this total, as all collected municipal waste is routed directly to the city landfill without processing. Wastewater management is largely decentralized via individual septic tanks, though a 48 MLD centralized STP recently became operational in March 2024. This inventory captures emissions from both septic systems and the STP (March 2024-December 2024).

The data highlights that waste management needs prioritization in Jalgaon. Scaling up source segregation, waste processing, legacy waste remediation, and setting up facilities for dealing with wet waste and recyclable waste can efficiently impact the emissions generated through this sector.

The wastewater emissions are calculated for emissions happening within the JCMC boundary. The untreated wastewater drained in the river/nallah may not generate emissions within JCMC boundary, but it will contribute to overall emissions at regional scale. This makes it necessary for the city to aim at installing efficient wastewater treatment infrastructure in the city to contribute to reducing overall GHG emissions.

4.5 Total GHG Emissions for Jalgaon, 2024

In 2024, total GHG emissions for Jalgaon city are estimated at 4,45,842 tCO₂e. Of this total, stationary energy accounts for the largest share at 41% followed by waste and wastewater at 35% and transportation at 24%. This distribution indicates that emissions in Jalgaon are concentrated in a limited number of core urban systems, particularly energy use, waste management, and mobility.

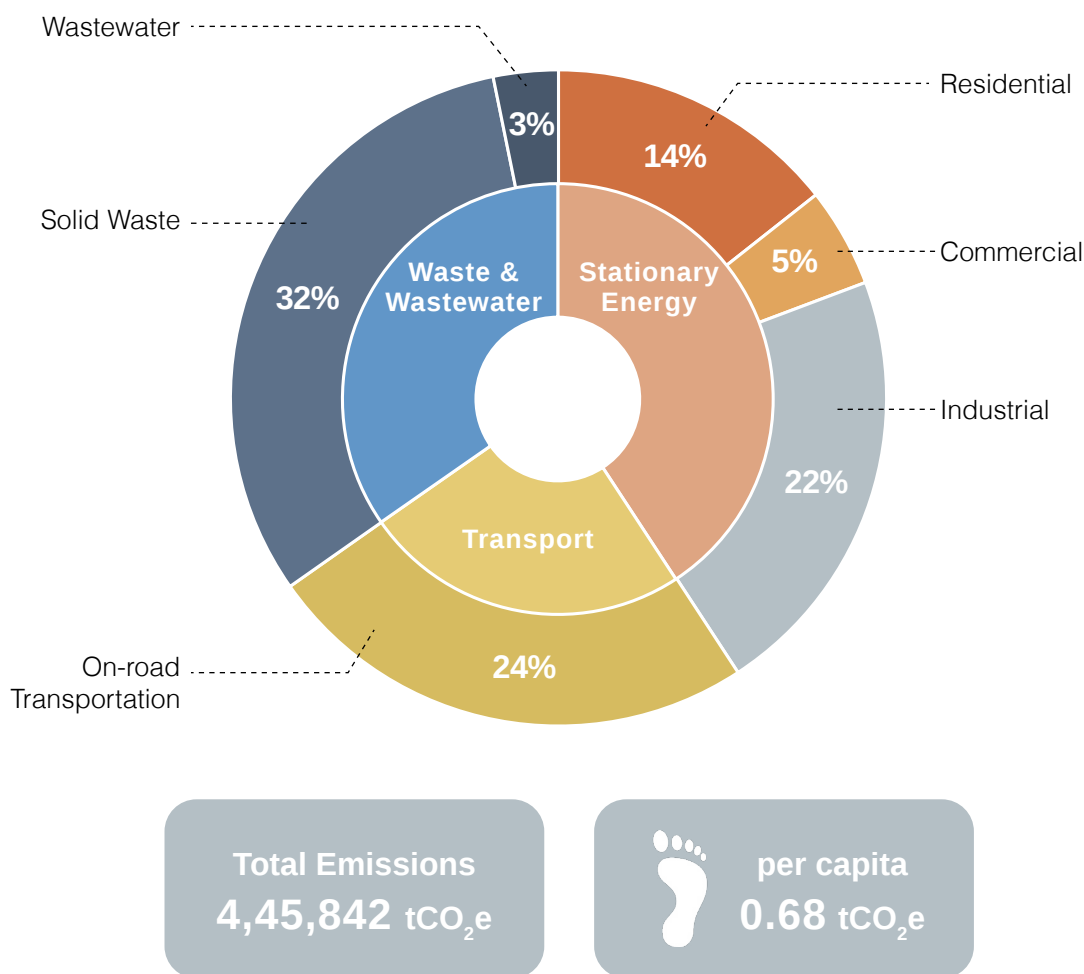


Figure 28: GHG emissions sectorwise breakdown (pie chart) (Source: MHT GHG inventory approach, 2024)

The city-wide inventory highlights the importance of pursuing mitigation measures across both infrastructure and service-delivery sectors. While stationary energy emerges as the largest contributor, the substantial share of waste and wastewater emissions also indicates the need for improved waste processing and treatment systems. Transportation, though comparatively lower in share, remains a significant source and requires targeted interventions to support cleaner and more efficient mobility.

4.6 Comparative Analysis

In 2024, Jalgaon (population: 6.5 lakhs) generated 4.45 lakh tonnes of GHG emissions, resulting in a per capita rate of 0.68 tCO₂e. Figure 29 provides a comparative baseline of greenhouse gas (GHG) emissions, total population, and per capita emissions across five tier-2 Indian cities: Udaipur, Patan, Nashik, Solapur, and Jalgaon.

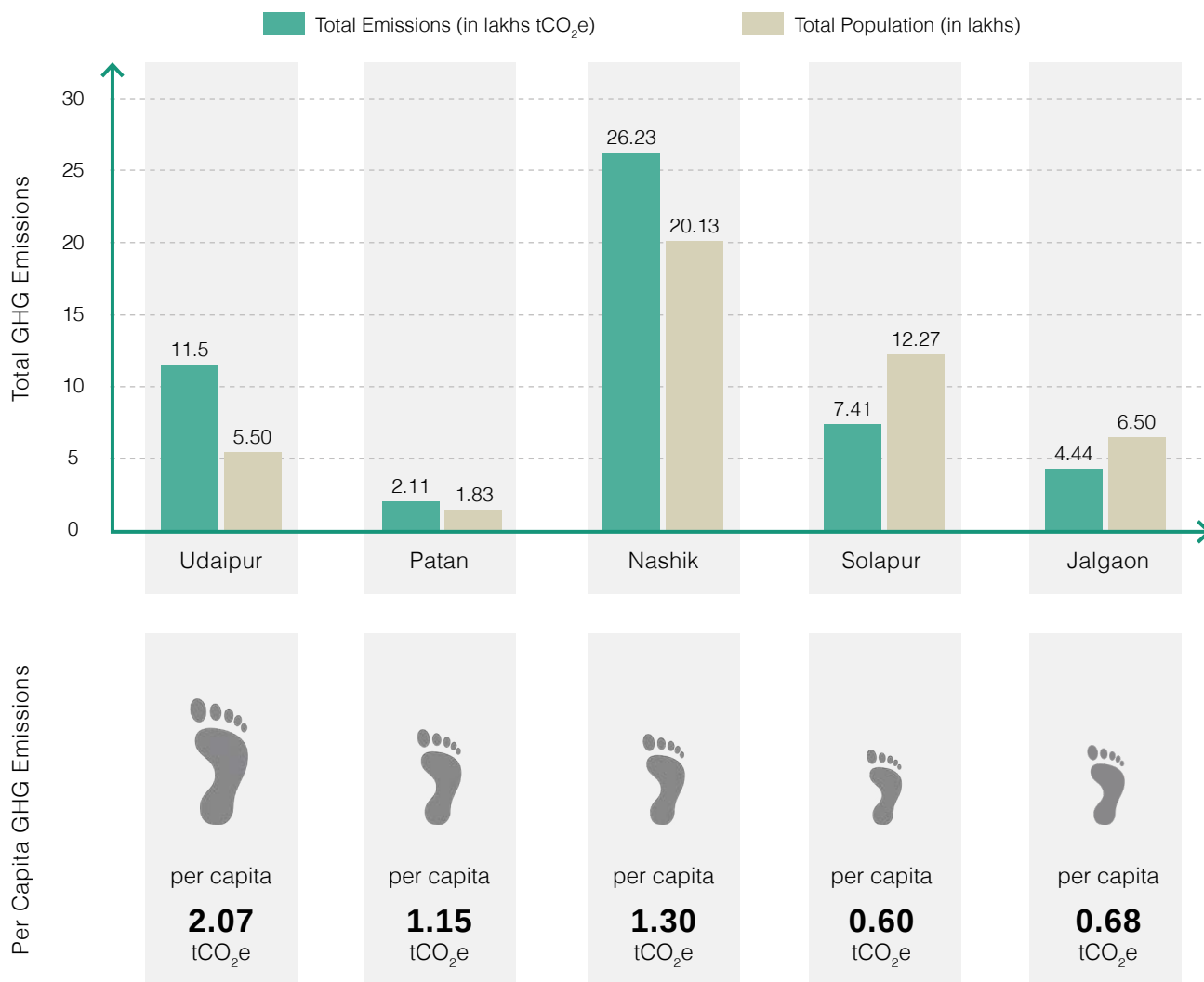


Figure 29: Comparative assessment of total GHG emissions and per capita emissions of other tier-2 Indian cities (Source: From their respective CAPs)

Across the benchmarked cities, total emissions range from 2.11 lakhs tCO₂e in Patan (population 1.83 lakhs) to 26.23 lakhs tCO₂e in Nashik (population 20.13 lakhs). On a per capita basis, figures across the cities range from 0.60 tCO₂e in Solapur and 0.68 tCO₂e in Jalgaon to 1.30 tCO₂e in Nashik, 1.15 tCO₂e in Patan, and 2.09 tCO₂e in Udaipur. This analysis shows that Jalgaon is emitting lower per capita emissions, and thus has an opportunity to plan for timely mitigation measures that can help prevent future emissions growth from becoming structurally embedded.

5. Future Emissions Scenarios and Targets

Future emissions scenarios provide a forward-looking assessment of how Jalgaon's greenhouse gas (GHG) emissions may evolve over time under different policy, infrastructure, and implementation pathways. Building on the 2024 baseline inventory, these scenarios help the city understand the likely trajectory of emissions in the absence of additional action, under currently feasible interventions, and under a more ambitious mitigation pathway aligned with longer-term climate goals. Scenario analysis is therefore a critical planning tool, as it enables comparison between alternative futures and supports the setting of realistic yet strategic targets for emissions reduction.

For Jalgaon, a different approach is taken where three GHG scenarios have been developed to project emissions through 2070. These include a Business-as-Usual (BAU) scenario, a Co-created scenario, and an Ambitious scenario. Together, they provide a framework for evaluating how sectoral decisions in energy, transport, waste, and wastewater may influence the city's long term emissions profile. From the identified scenarios each one reflects a distinct level of intervention, policy commitment, and institutional readiness. The following GHG Emissions scenarios have been identified for Jalgaon:

■ Business-as-Usual Scenario:

The Business-as-Usual scenario estimates future emissions under the assumption that no additional mitigation measures are introduced beyond existing trends. It serves as the reference case against which the effects of future interventions can be assessed.

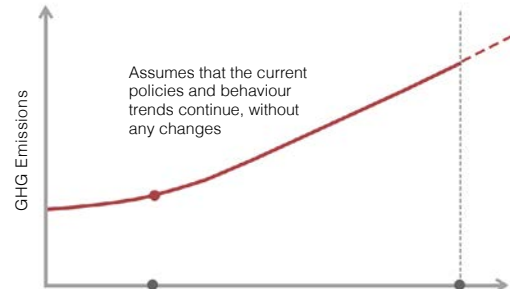


Figure 30: Graphical representation of BAU

■ Ambitious Scenario:

The Ambitious scenario assumes actions to achieve highest possible GHG reduction. It considers higher level of mitigation effort aligned with broader targets from India's Nationally Determined Contribution and longer-term low-carbon transitions. It assumes more accelerated adoption of clean energy, electrification, improved waste management, and systemic shifts in infrastructure and service delivery.

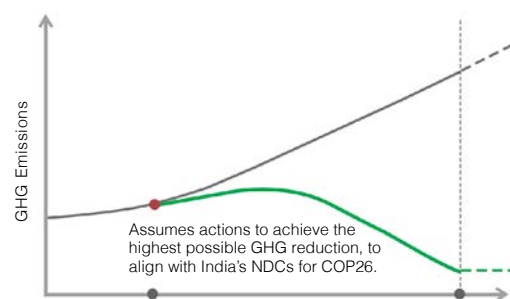


Figure 31: Graphical representation of Ambitious

■ Co-created Scenario:

The co-created scenario assumes actions that are co-created by MHT team with through consultations with JCMC and other stakeholders. The actions and targets of this scenario are considered practical, achievable, and institutionally grounded within Jalgaon's current planning context. It is based on commitments that the city is in a position to advance. Sector-specific objectives have been established for all major emission sources in Jalgaon. The targets associated with these objectives define the mitigation potential of each scenario and shape our emission reduction scenarios while laying the groundwork for detailed, actionable planning.

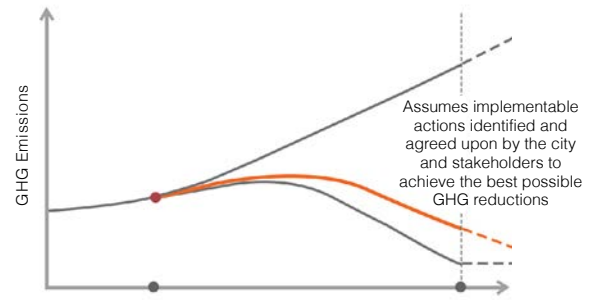


Figure 32: Graphical representation of Realistic

5.1 Business as Usual Scenario

The Business-as-Usual (BAU) scenario assumes the continuation of existing policies alongside a growing urban population. Consequently, activities that generate greenhouse gas (GHG) emissions increase accordingly. This trajectory is reflected in the graph as a steady upward curve, illustrating that emissions will consistently rise in tandem with population growth.

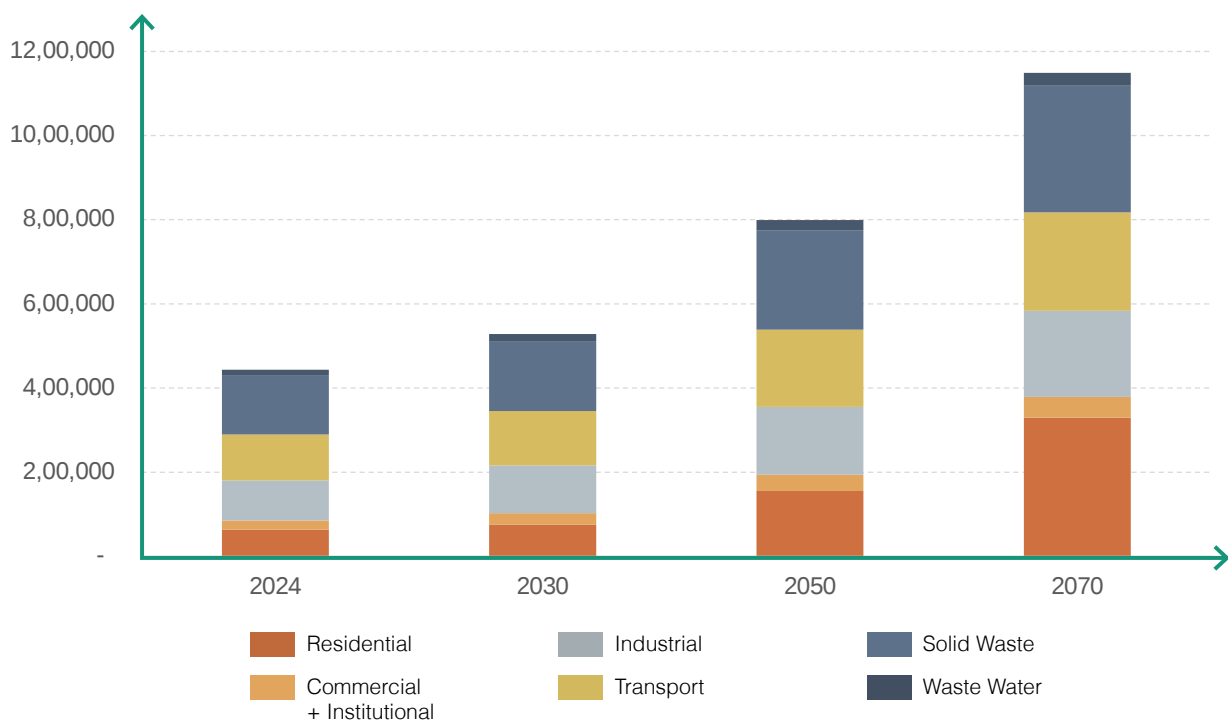


Figure 33: GHG Emissions; Business as Usual Scenario

To reduce emissions relative to the Business-As-Usual (BAU) scenario, specific objectives have been formulated for each sector for both Ambitious and Co-created scenarios. Emission reductions are calculated based on immediate (2030), mid-term (2050), and long-term (2070) targets. Table 4 and Table 5 details the specific sectoral targets established for each of these milestone years for both the scenarios.

Table 4: Assumptions considered in Ambitious scenario

#	Objectives	Ambitious Scenario		
		2030	2050	2070
1	Stationary Energy			
1.1 Grid Mix	Increasing the use of renewable energy in buildings and public infrastructure	10% Energy consumption shift to renewable energy	60% Energy consumption shift to renewable energy	100% Energy consumption shift to renewable energy
1.2 Fuel Shift	Transitioning to clean fuel for cooking, heating	100% shift to LPG	100% shift to LPG	100% Electrification
	Transitioning to cleaner fuels in Industrial and Manufacturing process	100% shift to LPG	100% shift to Electrification	100% shift to Electrification
2	Transport			
2.1 Public Transportation	Electrification of Bus fleet	60 EV buses	120 EV buses	220 EV Buses
2.2 Private Transportation	Shifting of private ICE vehicles on EV	30% shift to EV vehicle (including 2 and 4 wheelers)	70% shift to EV vehicle (including 2 and 4 wheelers)	100% shift to EV vehicle (including 2 and 4 wheelers)
3	Waste and Wastewater			
3.1 Solid Waste management	Zero waste to landfill	70% waste to land-fill+ 30% waste to MRF	50% waste to landfill+ 50% waste to MRF	0% waste to landfill+ 100% waste to MRF
	Transition of MRF facilities to RE	50% MRF to be run on clean energy	70% MRF to be run on clean energy	100% MRF to be run on clean energy
	Treatment of legacy waste	100% treatment of legacy waste	100% treatment of legacy waste	100% treatment of legacy waste
3.2 Waste water management	Waste water management through FSSM	20% of waste water treated through FSSM	60% of waste water treated through FSSM	100 % of waste water treated through FSSM

Table 5: Assumptions considered in Co-created scenario

#	Objectives	Co-created Scenario		
		2030	2050	2070
1	Stationary Energy			
1.1 Grid Mix	Increasing the use of renewable energy in buildings and public infrastructure	10% Energy consumption shift to renewable energy	50% Energy consumption shift to renewable energy	70% Energy consumption shift to renewable energy
1.2 Fuel Shift	Transitioning to clean fuel for cooking, heating	100% shift to LPG	100% shift to LPG	50% shift to LPG + 50% shift from LPG to Electrification
	Transitioning to cleaner fuels in Industrial and Manufacturing process	50% shift to LPG	100% shift to Electrification	50% shift to LPG + 50% shift from LPG to Electrification
2	Transport			
2.1 Public Transportation	Electrification of Bus fleet	60 EV buses	70 EV buses	200 EV Buses
2.2 Private Transportation	Shifting of private ICE vehicles on EV	30% shift to EV vehicle (including 2 and 4 wheelers)	50% shift to EV vehicle (including 2 and 4 wheelers)	70% shift to EV vehicle (including 2 and 4 wheelers)
3	Waste and Wastewater			
3.1 Solid Waste management	Zero waste to landfill	70% waste to land-fill+ 30% waste to MRF	50% waste to landfill+ 50% waste to MRF	0% waste to landfill+ 100% waste to MRF
	Transition of MRF facilities to RE	0% MRF to be run on clean energy	50% MRF to be run on clean energy	80% MRF to be run on clean energy
	Treatment of legacy waste	100% treatment of legacy waste	100% treatment of legacy waste	100% treatment of legacy waste
3.2 Waste water management	Waste water management through FSSM	20% of waste water treated through FSSM	30% of waste water treated through FSSM	50 % of waste water treated through FSSM

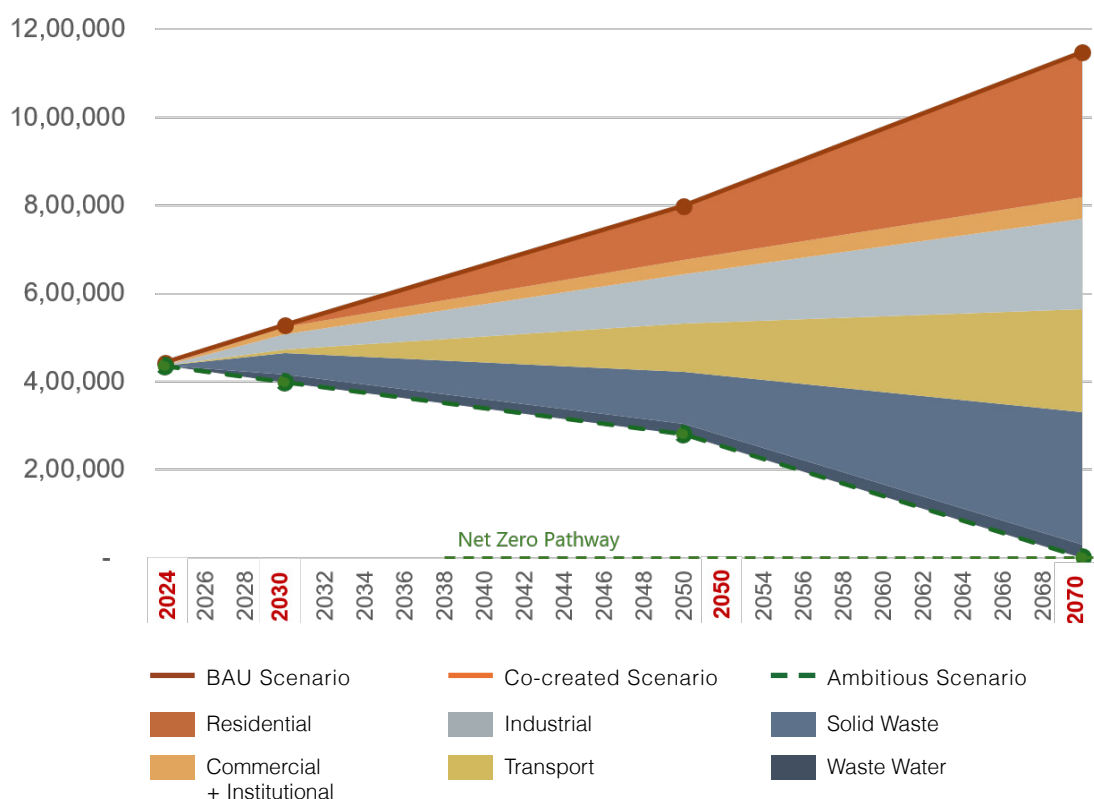


Figure 34: GHG emissions; Ambitious scenario indicating sector-wise reductions in emissions from BAU

5.2 Ambitious Scenario

The Ambitious scenario, initially proposed by the MHT team, outlines a rigorous pathway to achieve net-zero emissions through two primary objectives: centralized grid decarbonisation and sector-wide electrification. By cleaning up the power source at the grid level, the city can bypass the friction of decentralized decision-making and individual behavioural change, accelerating mitigation across all sectors. The scenario structures its interventions as follows:

■ **Stationary Energy:** Gradually shifts cooking appliances, heating systems, and across all residential, commercial, and institutional buildings from fossil fuel combustion to renewable energy usage. It also assumes all manufacturing processes in industrial buildings to eliminate fossil fuel combustion and shift to Renewable energy use.

■ **Transportation:** Targets a heavy transition from private vehicles to the public transport bus fleet (electric buses), alongside a substantial shift from conventional internal combustion engine (ICE) cars and two-wheelers to electric vehicles (EVs).

■ **Waste and Wastewater:** Eliminates the disposal of unsegregated waste at landfills by transitioning to 100% processing and treatment. All waste will be managed through electrified Material Recovery Facilities (MRFs) powered by a renewable grid by the horizon year.

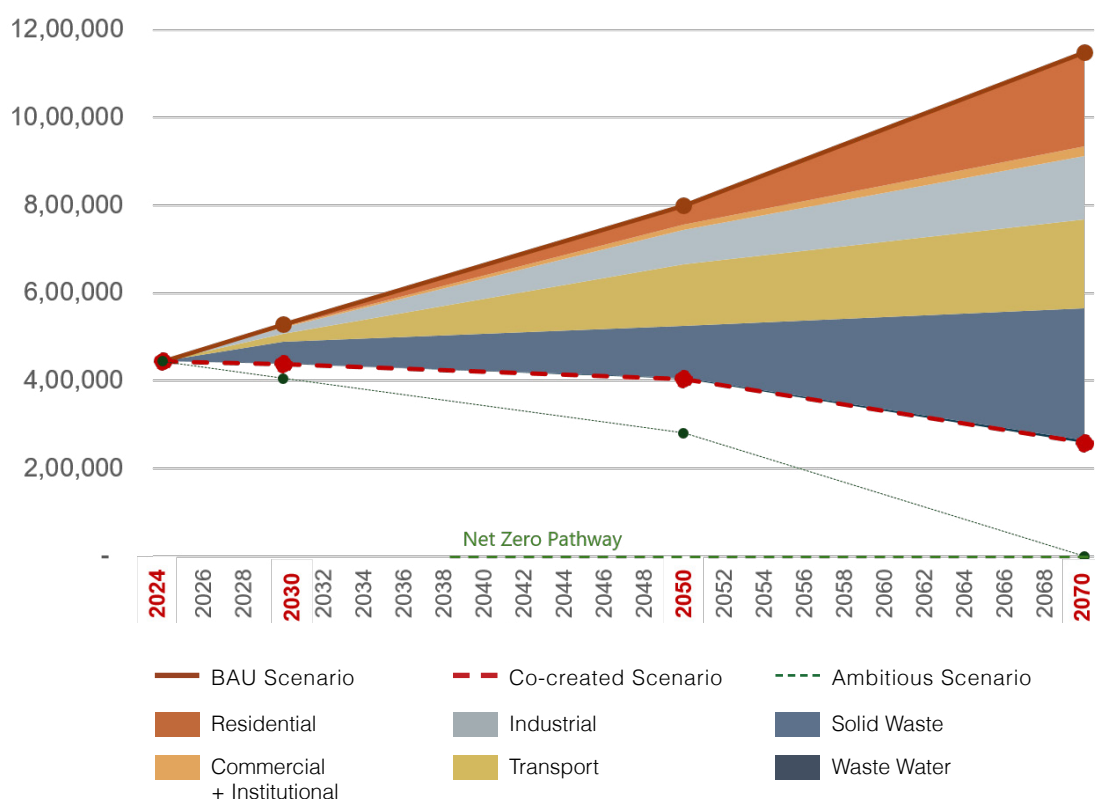


Figure 35: GHG emissions; Co-created scenario indicating sector-wise reductions from BAU

5.3 Co-created Scenario

To formulate the Co-created Scenario, the MHT team conducted extensive stakeholder consultations to ensure alignment with the city's actual capacity and willingness to reduce emissions. Rather than adopting an overly ambitious bucket list, the city departments agreed on specific actions tailored to their current infrastructure and future improvement plans. This collaborative filtering process has resulted in a pragmatic, well-planned scenario designed to achieve significant emission reductions.

The scenario structures its interventions as follows:

Stationary Energy: The co-created scenario relies primarily on transitioning to cleaner fuels—such as LPG and PNG—to drive emission reductions by 2050. However, it projects a gradual shift towards use of renewable energy over the long term. Specifically, it assumes that by 2050, 50% of industrial manufacturing processes will be using renewable energy to phase out fossil fuel combustion. Furthermore, by 2070, the scenario projects that 50% of cooking and heating systems across all residential, commercial, and institutional buildings will be using renewable energy.

Transportation: Similar to the Ambitious scenario, this scenario also targets a heavy transition from private vehicles to the public transport bus fleet (electric buses), alongside a substantial shift from conventional internal combustion engine (ICE) cars and

two-wheelers to electric vehicles (EVs).

■ **Waste and Wastewater:** Aligning with the ambitious scenario, this sector aims to eliminate the landfill disposal of unsegregated waste by transitioning to 100% processing and treatment. However, this co-created scenario adopts a more realistic, phased timeline. It targets complete waste treatment by 2030, followed by a gradual transition to clean fuels by 2050. Ultimately, it projects the full use of renewable energy of all Material Recovery Facilities (MRFs) by 2070.

Based on the assumptions for each objective, calculations were performed to estimate the resulting emission reductions. Figure 36 illustrates the emission trajectories across all three modelled scenarios. By 2070, the Ambitious Scenario achieves a net-zero pathway (a 100% reduction), the Co-created Scenario achieves a 77.5% reduction, as compared to the BAU Scenario. Detailed explanations of the Ambitious and Co-created scenarios and their underlying assumptions are provided in the following section.

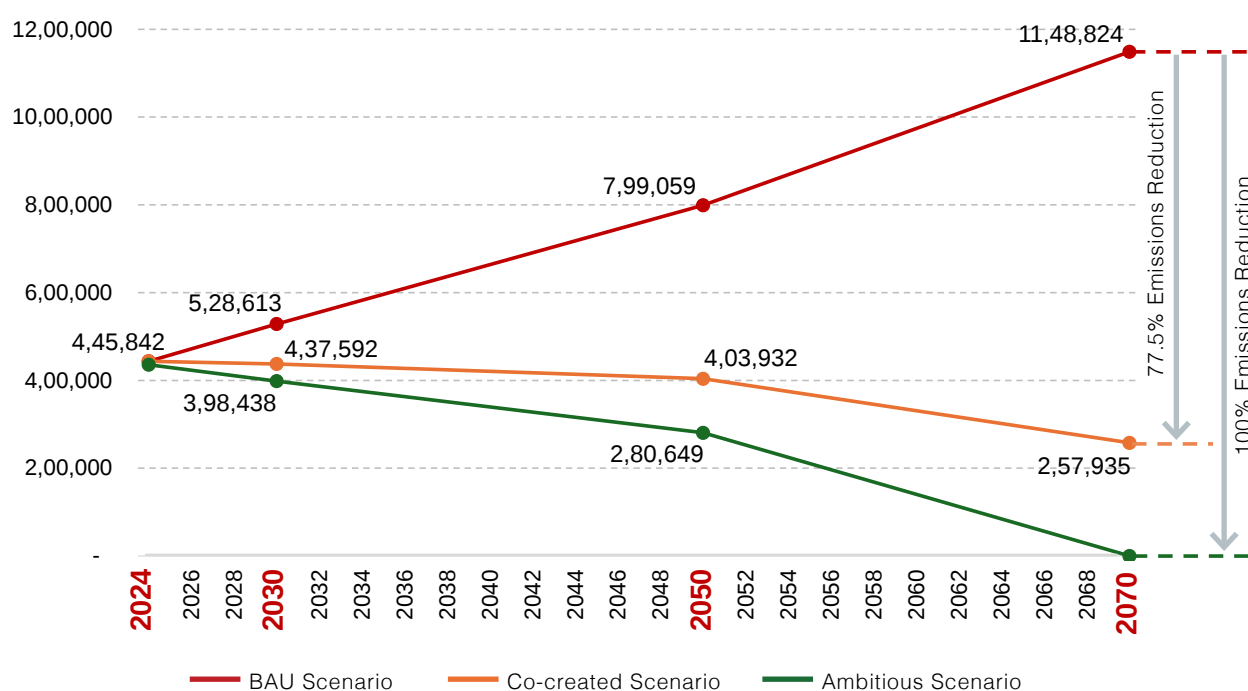
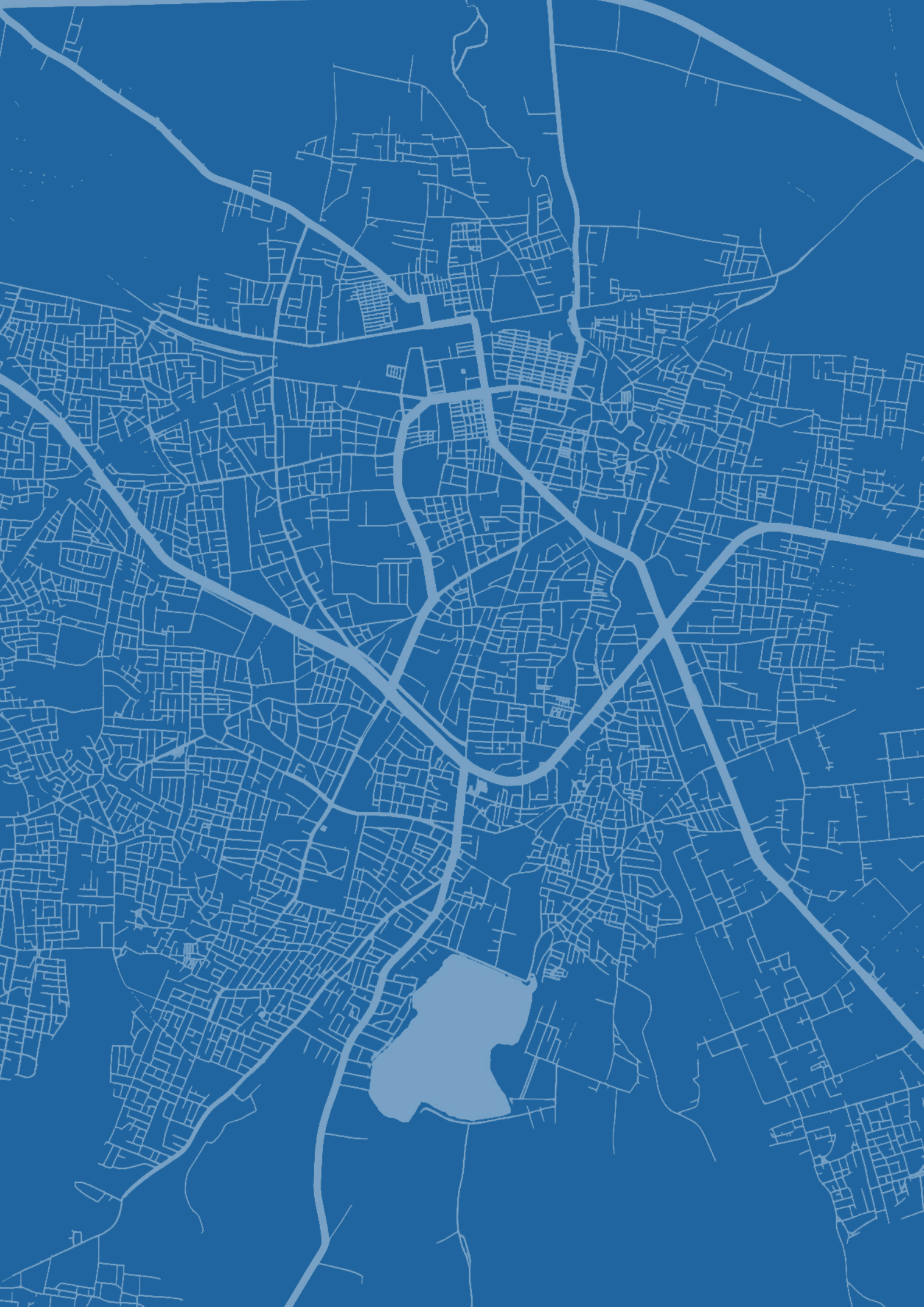
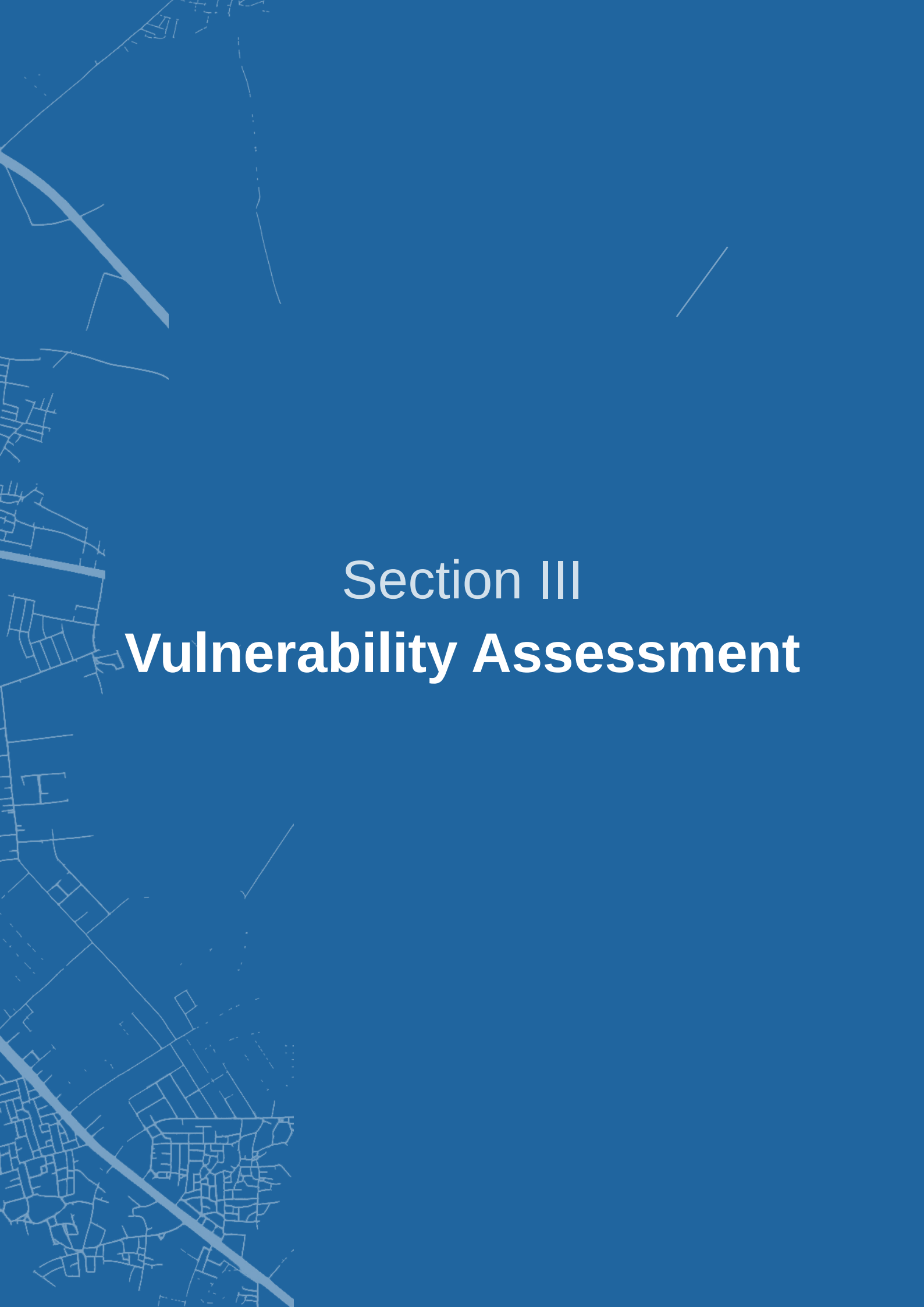


Figure 36: GHG emissions mitigation potentials of all Scenarios (BAU, Co-created and Ambitious)



Park of City
ROYAL PALACE
5
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Section III

Vulnerability Assessment

6. Climate Risk and Vulnerability Assessment

Jalgaon is experiencing a set of climate and environmental pressures that affect water availability, air quality, and thermal comfort across the city. These pressures are becoming more visible as the city grows and as demand on basic urban services continues to increase. The hazards discussed in this chapter are closely connected to daily life in Jalgaon, especially in areas where households depend on limited water sources, live in dense built-up environments, or face poor access to essential services.



Water Stress



Heat Stress



Air Quality

Water stress, Heat Stress, and Air quality are the three hazards considered here because they represent the most immediate environmental risks identified in Jalgaon. Each of these hazards affects the city in a different way, but together they shape Jalgaon's overall climate risk profile and help explain why some communities, particularly in informal settlements, are more exposed than others.

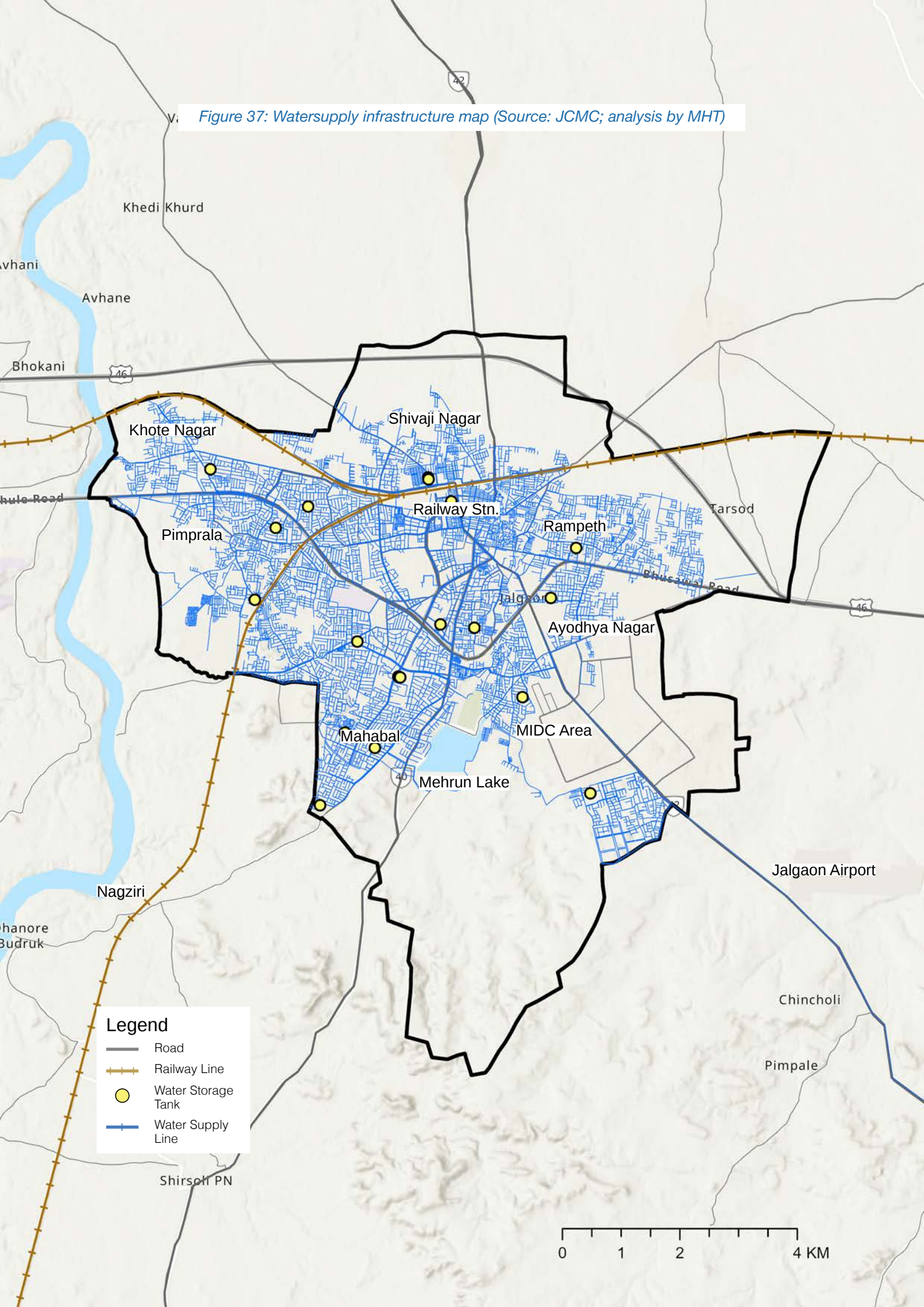


Water Stress

■ Water source and supply system:

Jalgaon's urban water supply depends mainly on surface water from Waghur Dam on the Waghur River, while the Girna River forms part of the wider hydrological context of the district. Water from Waghur is treated at the Umale Water Treatment Plant and then supplied through the city's storage, pumping, and distribution network. Figure 37 shows the water infrastructure map - the distribution network and storage facilities. The piped water-supply network in Jalgaon currently covers approximately 84% of the city, with the remaining area reliant partly or fully on alternative sources. Within the city, many housing societies and individual households also rely on borewells as a primary or secondary source, especially to supplement municipal supply for non-drinking purposes. This mixed dependence on municipal supply and borewells makes water access in Jalgaon sensitive to rainfall variability and seasonal groundwater recharge.

Figure 37: Watersupply infrastructure map (Source: JCMC; analysis by MHT)



Rainfall Variability:

The city receives an average annual rainfall of about 778.52 mm, with most precipitation concentrated during the southwest monsoon months from June to September. August and September are typically the wettest months, indicating that rainfall is strongly seasonal and concentrated within a relatively short period.¹ This pattern limits the time available for surface-water replenishment and groundwater recharge, making annual water availability highly dependent on monsoon performance. As shown in Figure 38, the annual precipitation graph for 2014-2024 indicates clear inter-annual variability, with 2015 and 2018 emerging as drought years when rainfall fell more than 26 percent below the long-term average. These rainfall deficits would have reduced recharge and placed additional pressure on household water access, municipal supply systems, and the city's overall water security.

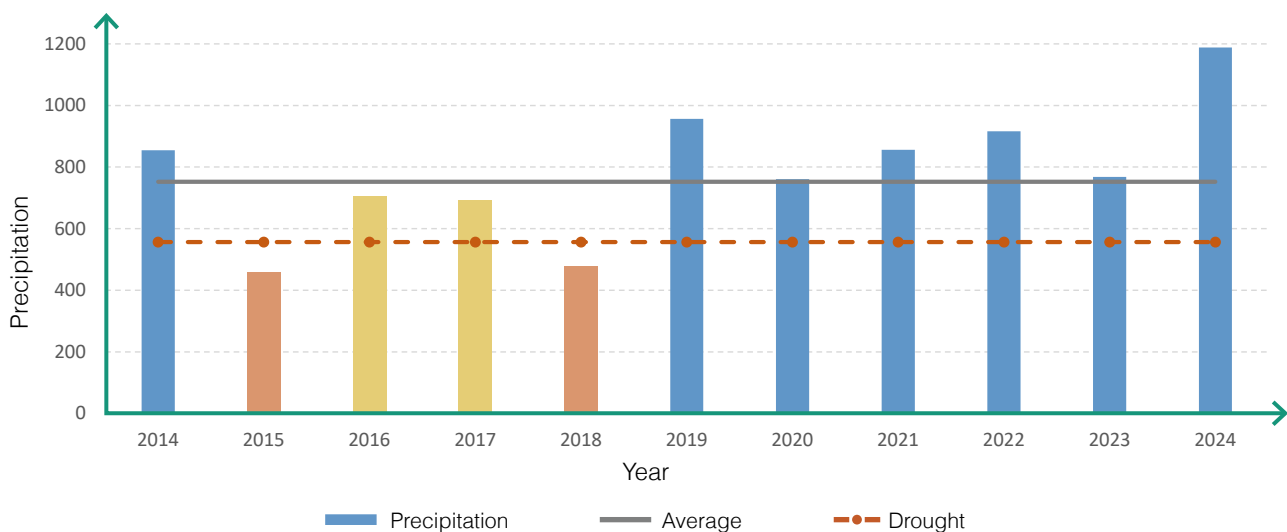


Figure 38: Annual precipitation over the years 2014-2024 (mm) (Source: IMD)

Groundwater:

Groundwater is an important supplementary source of water in Jalgaon, particularly in areas where municipal supply is limited or irregular. CGWB data indicate that pre-monsoon groundwater levels in Jalgaon district are among the lowest in the region, with a decline of about 0.4 to 0.6 metres and a longer-term fall of more than 0.20 metres per year during the same season.² The groundwater trend figure also indicates a continuing decline over time, pointing to increasing stress on recharge and growing uncertainty in local water availability. This is especially significant for vulnerable settlements, where 580 households depend on borewell supply.³ At the same time, 22 slums, covering 8,379 households, receive water only twice a week for about two hours, while others receive it even less frequently.³ This pattern underscores groundwater decline as both an environmental concern and a key equity issue in service access.

1. IMD, Jalgaon monthly rainfall climatology based on long-term station data.

2. Central Ground Water Board (CGWB), Jalgaon district groundwater level and trend reports, pre-monsoon observations.

3. Mahila Housing Trust (MHT), primary survey of informal settlements in Jalgaon, household-level water supply data.

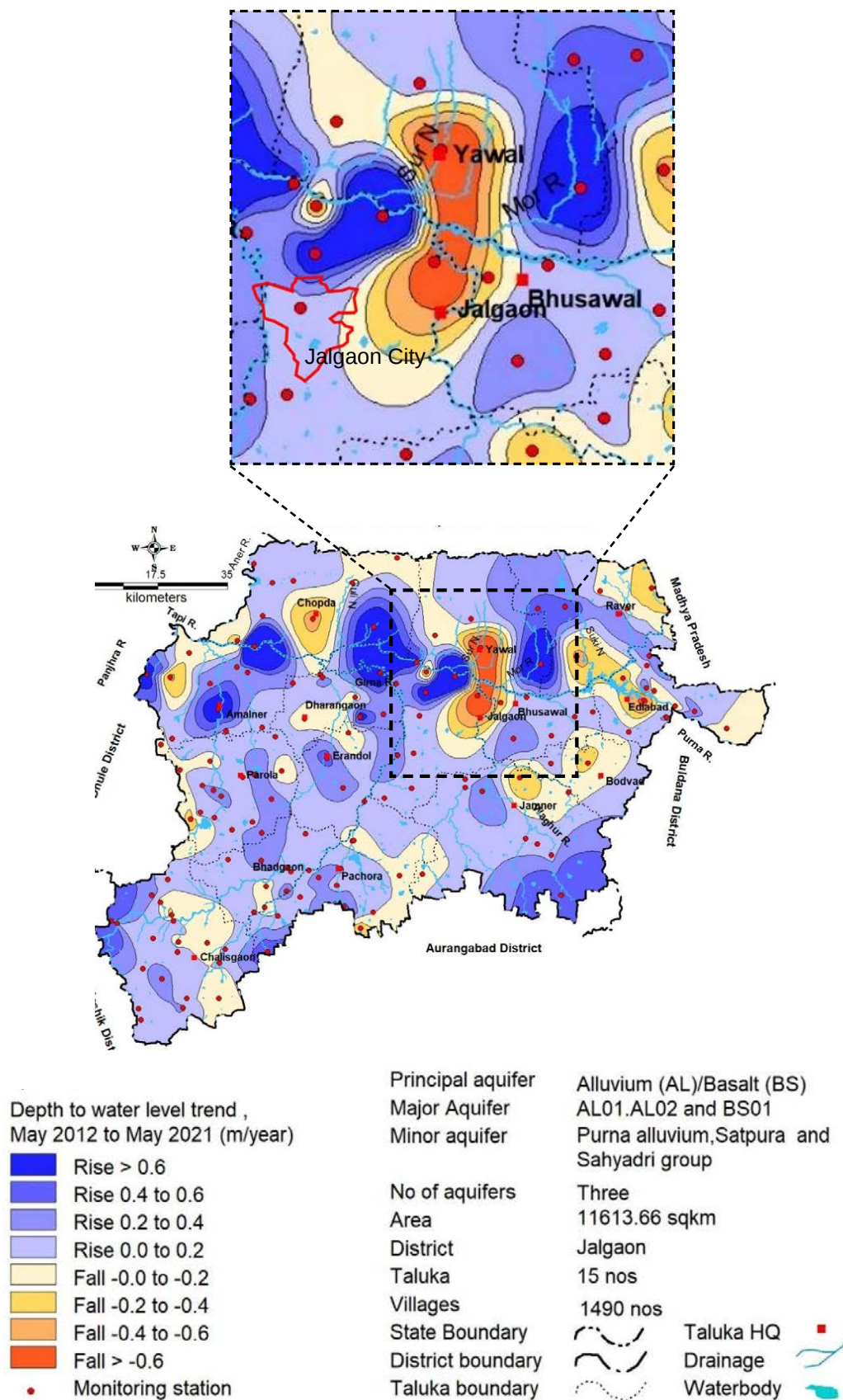


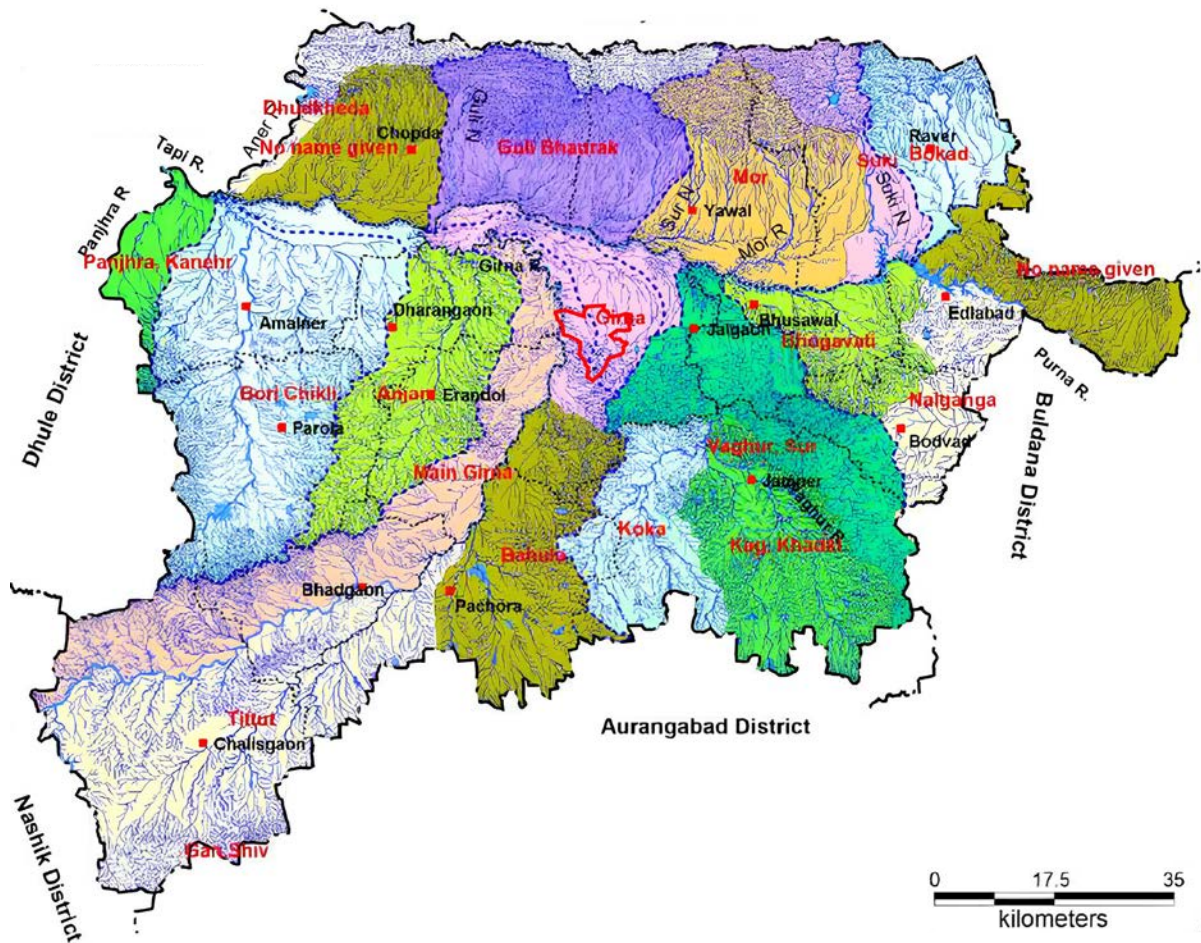
Figure 39: Pre-monsoon ground water level trend, Jalgaon district (May 2012–May 2021) (Source: CGWB, 2021)

■ Flood Exposure:

Jalgaon's urban form, drainage pattern, and topography create localised flood susceptibility in parts of the city where natural runoff is restricted by dense development, road infrastructure, and limited stormwater capacity. The Girna River forms a key hydrological feature in the wider Jalgaon region and influences the behaviour of surface runoff during intense rainfall events. As indicated in Figure 42, low-lying areas - specifically built areas are particularly vulnerable during intense rainfall, as water tends to accumulate faster than it can be absorbed or safely conveyed away. The stormwater drainage infrastructure is limited in the peripheral parts of the city and weak or absent in several slum settlements, increasing their exposure to waterlogging, access disruption, and localized flooding. In such areas, flooding is not only an infrastructure issue but also a service-delivery and public safety concern, especially where settlements, markets, and key activity corridors lie close to drainage paths.

As indicated in Figure 41, the watershed structure channels rainwater through defined flow routes across the city, which form part of the Girna River basin drainage network. Where these routes pass through built-up areas, obstruction, narrowing, and encroachment are increasing runoff concentration and worsening waterlogging in adjoining low-lying areas. This pattern highlights the role of natural drainage alignment in shaping local flood risk and helps explain why some parts of the city remain more exposed to repeated inundation than others.





Legend

Principal aquifer	Alluvium (AL)/Basalt (BS)
Major Aquifer	AL01.AL02 and BS01
Minor aquifer	Purna alluvium,Satpura and Sahyadri group
No of aquifers	Three
Area	11613.66 sqkm
District	Jalgaon
Taluka	15 nos
Villages	1490 nos
State Boundary	-----
District boundary	-----
Taluka boundary	-----
	Taluka HQ ■
	Drainage ~
	Waterbody ~
	Watershed ~ Main girna

Figure 40: Drainage map, Jalgaon district (Source: CGWB, 2021)

Figure 41: Watershed Analysis Map (Source: DEM-based hydrological modelling; analysis by MHT)

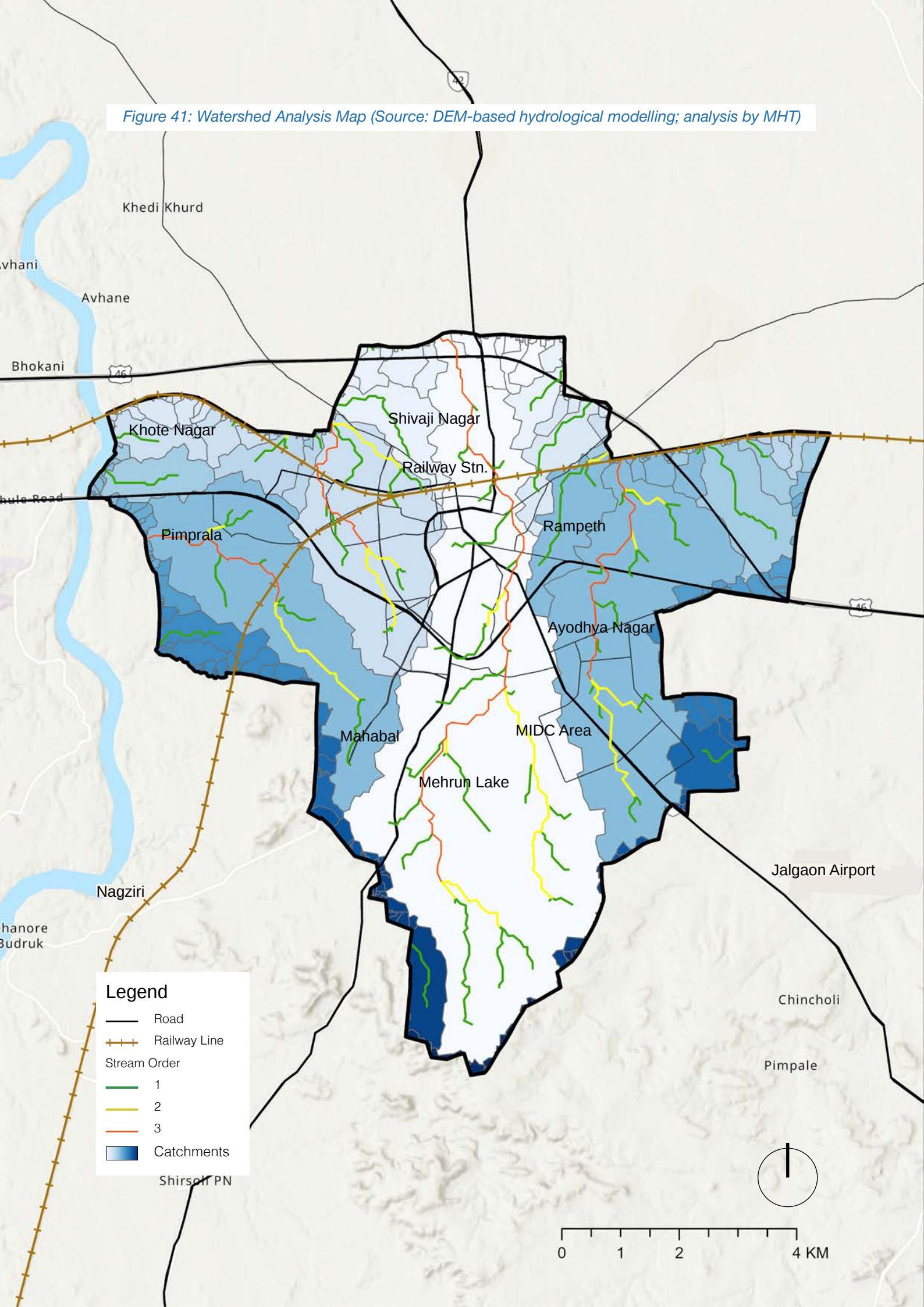
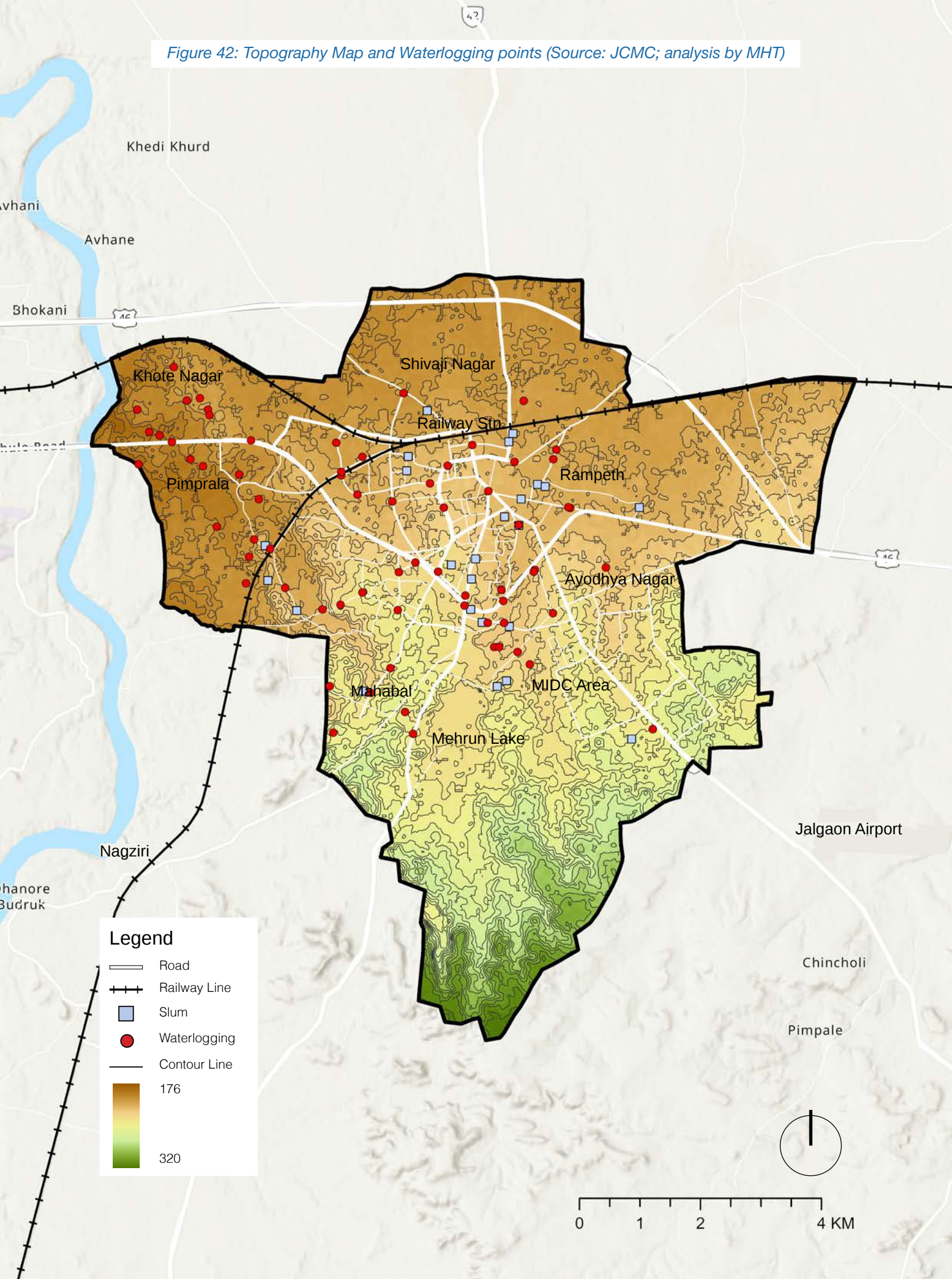


Figure 42: Topography Map and Waterlogging points (Source: JCMC; analysis by MHT)



■ Sewerage System:

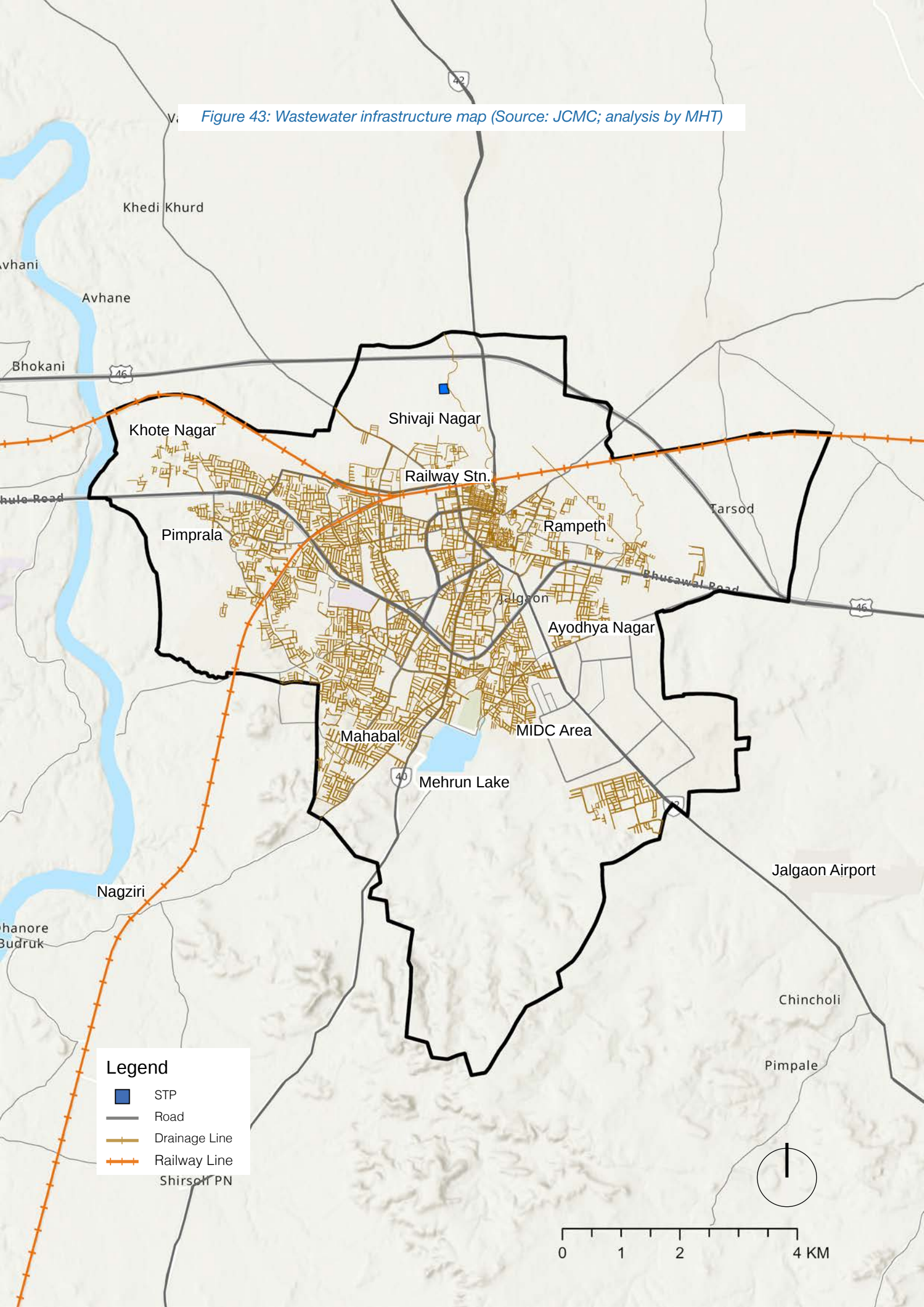
The city's sewerage system remains uneven, with network coverage concentrated in core built-up areas and weaker connectivity in peripheral wards and informal settlements. The underground sewerage network in Jalgaon currently covers approximately 70% of area, with the remaining population dependent on onsite and informal arrangements. In these locations, households often depend on incomplete underground networks, septic arrangements, or ad hoc disposal pathways, which increases the risk of leakage, overflow, and unsafe discharge into nearby drains or open spaces. Limited conveyance capacity also places pressure on the existing treatment system, especially where the sewerage network has not expanded in step with urban growth. As a result, sanitation issues are more prevalent in rapidly developing edges of the city, where density is rising but infrastructure provision has not kept pace. Gaps in sewer connections, combined with aging or undersized infrastructure, make wastewater management less reliable and create localized public health concerns.

The Figure 43 shows the areas where sewerage network coverage is absent or incomplete, highlighting the spatial extent of the service gap. For Jalgaon, available city-level documentation indicates that sewage generation outpaces treatment provision, and the existing STP capacity remains limited relative to demand. This suggests that the sewerage challenge is not only one of network reach but also of end-of-line treatment, where limited infrastructure constrains safe collection, transport, and disposal of wastewater.



Mehrun Lake (Source: Incredible India)

Figure 43: Wastewater infrastructure map (Source: JCMC; analysis by MHT)





Heat Stress

Heat stress in Jalgaon reflects the uneven accumulation and retention of heat across the urban area, shaped by built-up density, land cover, and surface materials. Areas with limited vegetation and a higher concentration of heat-absorbing surfaces experience stronger thermal intensity, while zones with more open land or vegetative cover tend to moderate heat to some extent. This makes heat stress not only a climatic issue but also a spatial one, with certain parts of the city consistently more exposed than others. Informal settlements and vulnerable communities are particularly important in this context because they often occur in areas with lower environmental buffering and weaker access to shade, open space, and thermal comfort.

Land Surface Temperature (LST) mapping highlights this variation clearly. As shown in Figure 45, daytime LST is higher in the peripheral parts of the city, reaching approximately 50°C, compared with around 40°C in the central built-up areas. Night-time LST patterns, shown in Figure 44, reflect the retention and release of heat across different urban surfaces. Barren areas cool more quickly after sunset, while built-up areas retain accumulated heat for longer periods, indicating the presence of an urban heat island effect. Figure 45 further shows the location of informal settlements in relation to heat exposure, indicating that areas of social vulnerability and higher thermal stress frequently coincide. Five slums are situated in Very High LST regions while another five are situated in High LST regions highlighting that a significant population living in the slums is exposed to extreme heat.

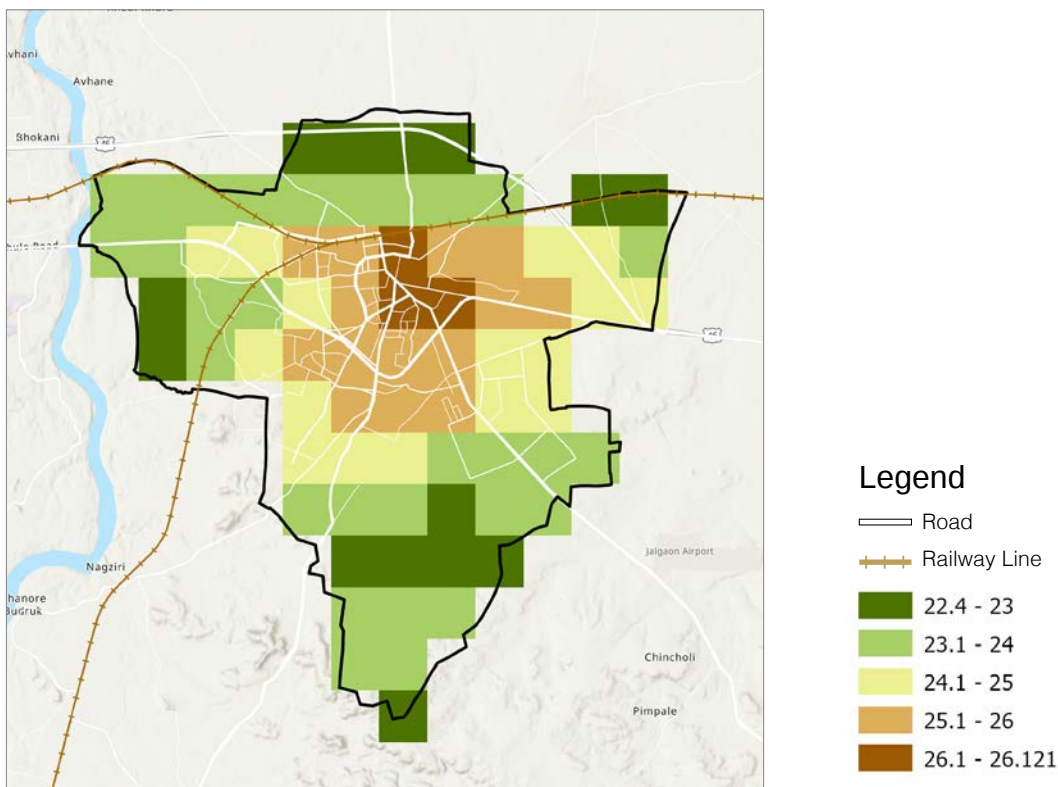
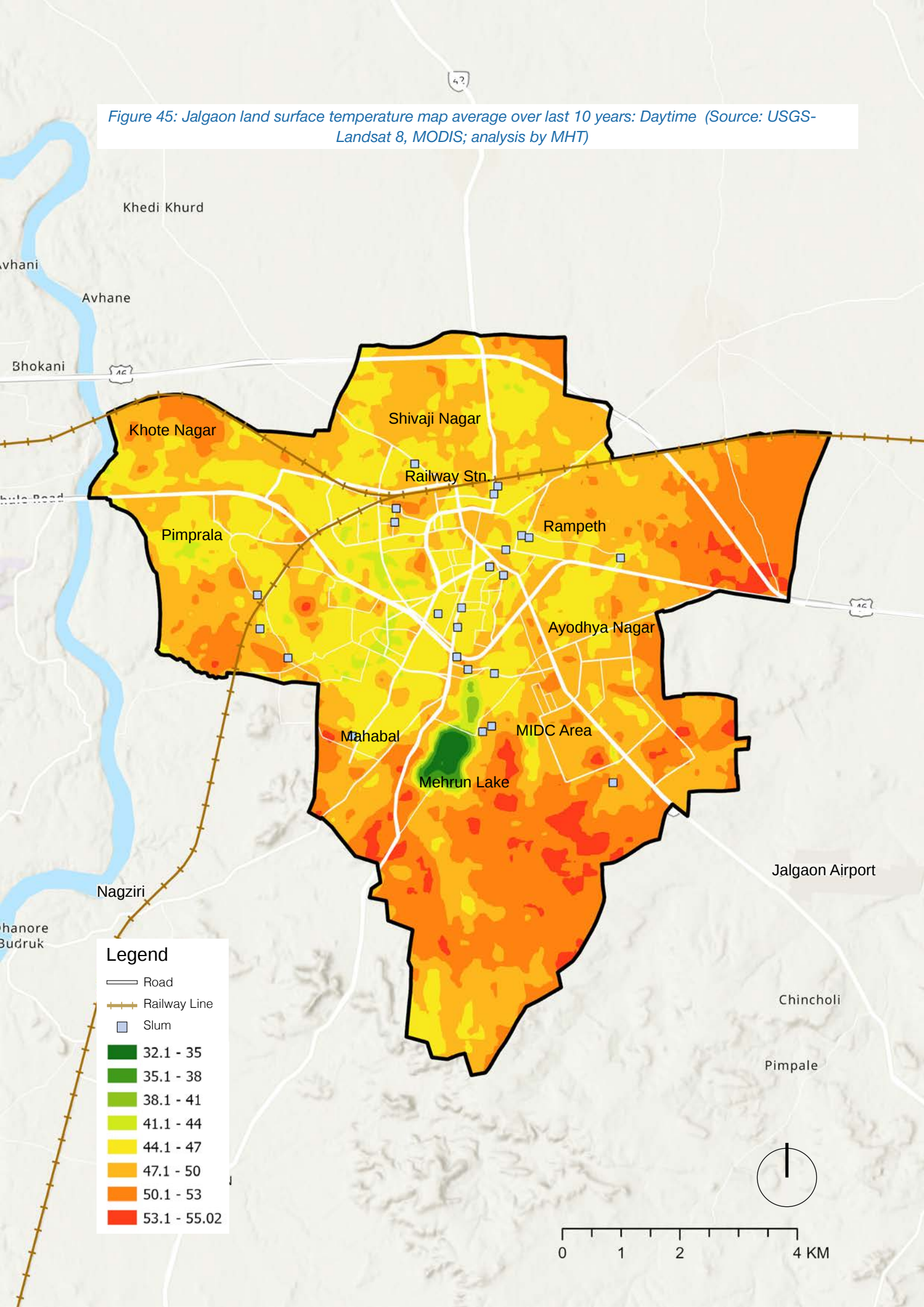


Figure 44: Jalgaon land surface temperature map average over last 10 years: Night-time (Source: USGS-Landsat 8, MODIS; analysis by MHT)

Figure 45: Jalgaon land surface temperature map average over last 10 years: Daytime (Source: USGS-Landsat 8, MODIS; analysis by MHT)





Air Quality

Air quality refers to the condition of the atmosphere in terms of the concentration of pollutants that affect human health, visibility, and environmental well-being. In urban areas, it is shaped by vehicle emissions, road dust, combustion sources, and suspended particulate matter, making it an important indicator of environmental stress. Poor air quality is especially significant in densely built-up cities because residents are more likely to experience prolonged exposure, particularly in traffic corridors, mixed-use areas, and neighborhoods with limited green cover. Its impacts extend beyond discomfort, as degraded air quality can increase respiratory stress, affect vulnerable groups such as children and older adults, and add to the broader burden of urban health risk.

In Jalgaon, this concern is reflected in the Figure 46, which shows that particulate matter remains the main issue. PM_{2.5} is about 25% above the permissible limit, while PM₁₀ is about 45.5% above the permissible limit. By contrast, NO₂ and SO₂ remain within acceptable ranges, indicating that the dominant concern is suspended particulate pollution rather than gaseous pollutants. This pattern suggests that air pollution in Jalgaon is driven more by fine particles and dust than by other air contaminants, making it an important issue for monitoring, planning, and exposure reduction.

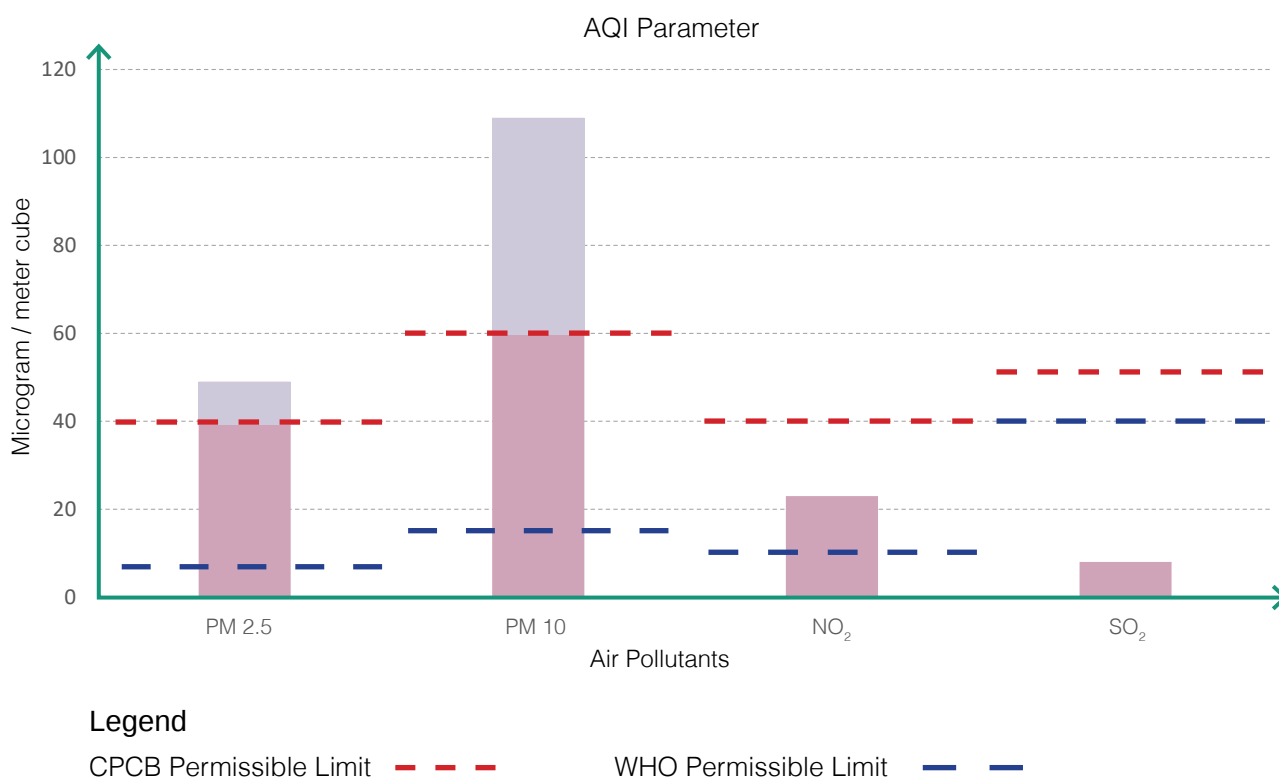
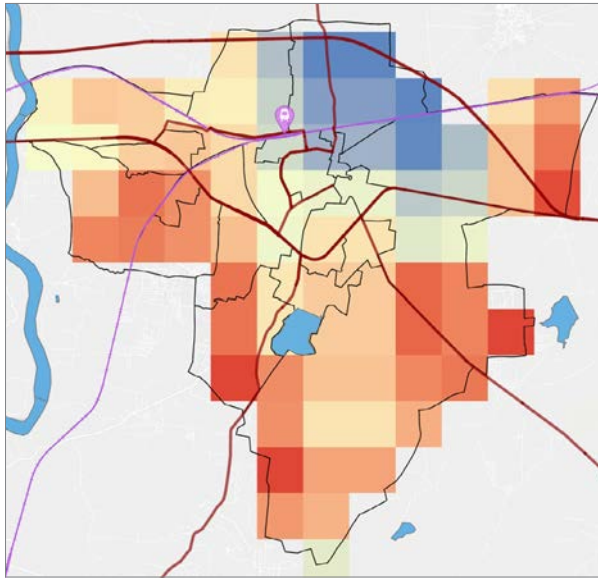


Figure 46: AQI parameters in Jalgaon 2024: PM 2.5, PM 10, NO₂, SO₂ vs Permissible limits (Source: CPCB / IMD)



SO₂

Legend

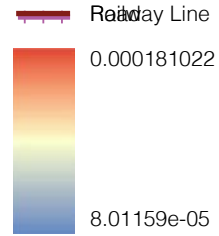
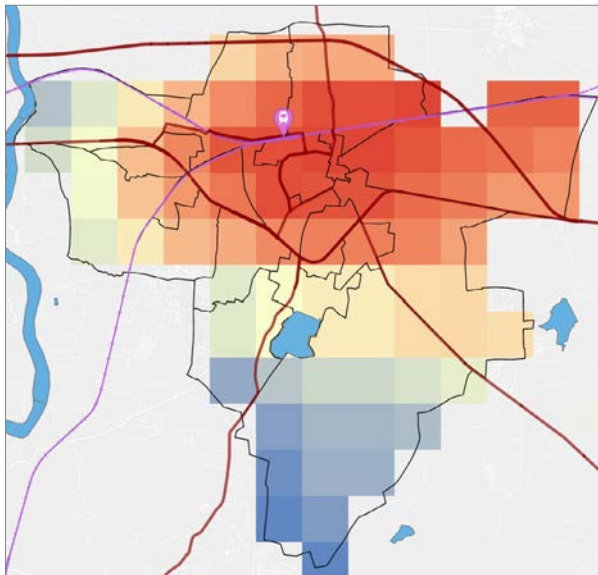


Figure 47: Jalgaon City SO₂ Map (Source: Analysis by MHT)



NO₂

Legend

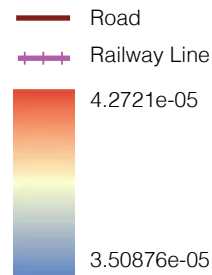
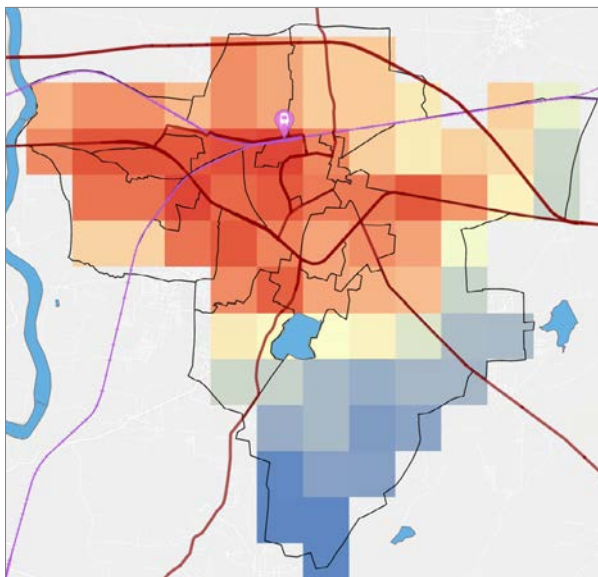


Figure 48: Jalgaon City NO₂ Map (Source: Analysis by MHT)



PM 2.5

Legend

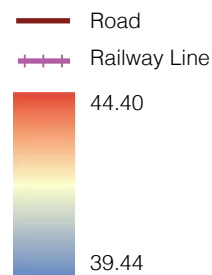


Figure 49: Jalgaon City PM2.5 Map (Source: Analysis by MHT)

6.4 Assessment of Impacts on Vulnerable Communities

Jalgaon's vulnerability is shaped by the interaction between environmental risks, infrastructure conditions, and access to essential services. The effects of heat, water stress, and poor air quality are more severe for vulnerable communities, especially where service delivery is weak and households have limited capacity to cope with environmental stress. In this context, vulnerability is not defined only by the presence of environmental pressures, but also by the ability of urban systems and communities to respond to them. Where poor infrastructure and limited service access overlap with environmental stress, the impacts become harder to manage and more persistent.

Figure 50 illustrates how major environmental risks intersect with key service-access indicators across the city, showing that climate-related vulnerability is shaped not only by exposure, but also by the strength of core urban systems. Figure 51 presents the essential service indicators used to understand how vulnerable communities in Jalgaon are affected by climate stress. It highlights how gaps in healthcare, electricity, emergency response, and hospital access reduce the ability of people to respond effectively to heat and other environmental pressures.

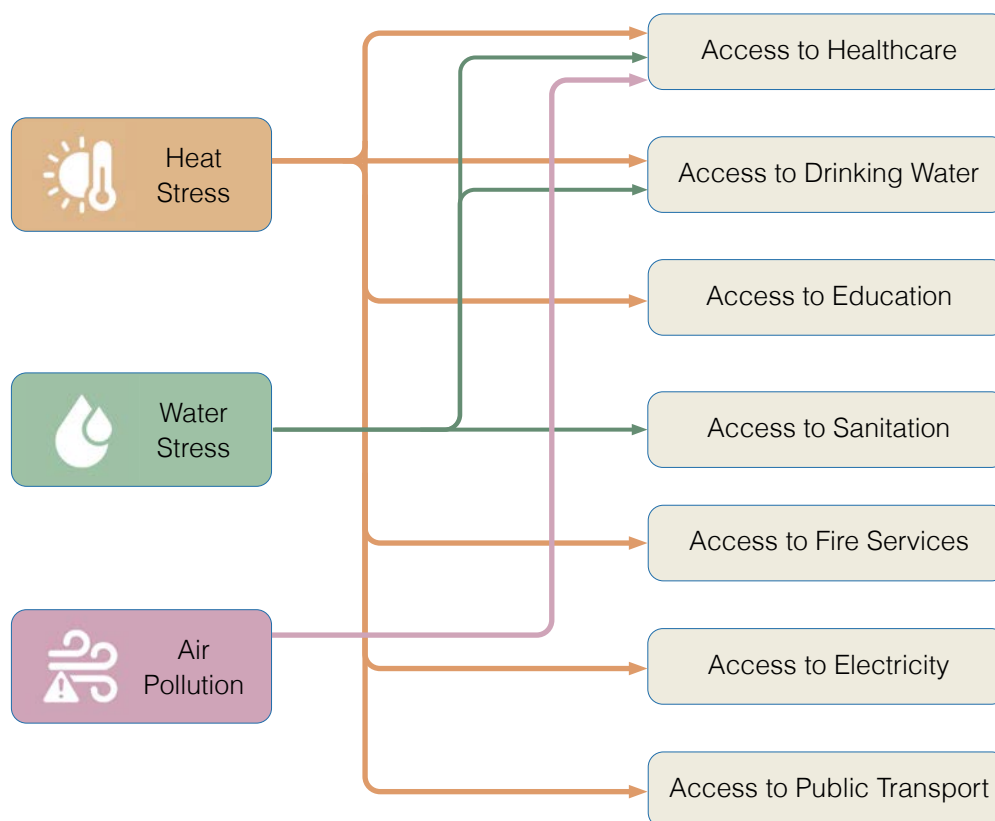


Figure 50: Vulnerability framework: Heat stress / Water stress / Air pollution linked to essential service access indicators (Source: MHT)

Indicator	Vulnerability Rationale	Vulnerability Analysis
 Access to Healthcare	Enables timely treatment of climate-related illnesses; strengthens city response to heatwaves and extreme events.	As per UPHC guidelines, 1 PHC/UPHC can serve 50,000 people. Jalgaon has 6 UPHCs, serving a population of approximately 3,00,000.
 Literacy Rate	Higher literacy increases adaptive capacity and awareness of climate risks.	Literacy rate: 87.28% - male 90.91%, female 83.37% (Census 2011).
 Access to Fire Station	Coordinates emergency response during extreme heat alerts; trains communities on heatwave preparedness.	Only one fire station covers 68.78 sq.km. Mandated response time per Maharashtra Fire Services: 5 minutes.
 Access to Electricity	Enables use of cooling appliances and improves thermal comfort during extreme heat.	24% of people in Jalgaon do not have access to electricity.
 Access to Hospital	Critical for managing climate-related health emergencies.	84% of people have access to hospitals as per NUHM guidelines (1 health centre should serve 50000 people)

Figure 51: City-wide vulnerability indicators (Source: MHT)

Although these vulnerabilities are visible across Jalgaon, they are most acute in informal settlements. Census 2011 records about 28,224 people, or 6.31 percent of the city's population, living in slums, while MHT conducted a primary survey and identified 25 notified slum settlements (Source: JCMC) with 11,659 households. The survey focused on gaps in basic services such as water supply, sanitation, electricity, road access, and drainage in these 25 settlements. Table 6 shows service access in Jalgaon's notified slum settlements, highlighting the uneven availability of essential infrastructure that shapes everyday exposure and limits coping capacity.

Table 6: Assumptions considered in Co-created scenario

Sr.	Ward	Name of Slum	Drainage	School	Hospital	Garbage collection	% HH Access to Individual toilets	Water supply frequency
1	1	Laxmi Nagar, Kanldha Road	✓	✓	✓	Irregular (Inaccessible by collection vehicle)	90%	Twice in a week
2	3	Indira Nagar	✓	✓	✓	Irregular (Inaccessible by collection vehicle)	80%	Twice in a week
3	4	Gurunanak Nagar	✓	✓	✓	Regular	75%	Twice in a week
4	5	Shahu Nagar	✓	✓	✓	Irregular (Inaccessible by collection vehicle)	95%	Twice in a week
5	5	Indira Nagar khedi	✓	✓	✓	Regular (no issue reported)	95%	Twice in a week
6	6	Dangal Grast Colony	✓	✓	✓	Regular (no issue reported)	100%	Twice in a week
7	6	Tukaram Vadi	✓	✓	✓	Regular	95%	Twice in a week
8	10	Khanderao Nagar	✓	✓	✓	Regular (no issue reported)	90%	Twice in a week
9	11	Rajiv Gandhi Nagar	✓	✓	✓	Irregular (Inaccessible by collection vehicle)	50%	Twice in a week
10	11	Hari Vithal Nagar	✓	✓	✓	Regular (no issue reported)	90%	Twice in a week
11	13	Samata Nagar	✗	✗	✓	Irregular (Inaccessible by collection vehicle)	75%	Twice in a week
12	14	Bhilati	✓	✓	✓	Regular (fixed collection point; some open dumping)	70%	Twice in a week
13	15	Tambepura	✓	✓	✓	Regular (no issue reported)	60%	Twice in a week
14	15	Fukatpura	✓	✓	✓	Not Specified	60%	Twice in a week
15	16	Jhakni Nagar	✓	✓	✓	Regular (no issue reported)	85%	Twice in a week
16	16	Sanjay Gandhi Nagar	✓	✓	✓	Regular (no issue reported)	85%	Twice in a week
17	16	Kasam Vadi	✓	✓	✓	Irregular (Limited accessible by collection vehicle)	90%	Twice in a week
18	17	Bunkarwada Panjrapol	✓	✓	✓	Regular (fixed collection point; some open dumping)	70%	Twice in a week

Sr.	Ward	Name of Slum	Drainage	School	Hospital	Garbage collection	% HH Access to Individual toilets	Water supply frequency
19	17	Ambedkar Nagar	✓	✓	✓	Irregular (Inaccessible by collection vehicle)	5%	Twice in a week
20	17	Chagule plot	✓	✓	✓	Regular (no issue reported)	92%	Twice in a week
21	17	Gopalpura	✓	✓	✓	Regular (no issue reported)	85%	Twice in a week
22	19	Ambedkar Nagar Punarvasan Khedi	✓	✓	✓	Regular (no issue reported)	90%	Twice in a week
23	19	Supreme Colony	✓	✓	✓	Irregular service (comes every 3-4 days)	70%	Twice in a week
24	19	Laxmi Nagar Mehrun	✗	✓	✓	Not specified	60%	Upto 2 hours in a day
25	6	Siddharth Nagar	✗	✓	✓	No organised service	10%	Upto 2 hours in a day

Figure 52 further shows that service deficits are widespread in informal settlements, particularly in water supply, drainage, sanitation, and access to nearby schools. These gaps deepen everyday vulnerability by affecting living conditions, reducing mobility, and limiting households' ability to cope with climate stress.

Parameter

Vulnerability Assessment



Drainage: Most of the city has open drains. Of the 25 slums surveyed, Samata Nagar, Laxmi Nagar Mehrun, and Siddharth Nagar did not have a drainage system at all.



Access to School: 8.14% of households do not have access to a public school within 1 km of distance.



Access to Hospitals: All slums have access to public hospitals in their wards.



Waste Disposal: Door-to-door collection available in 57% of households; open collection in 34%; open dumping is used in 9%.

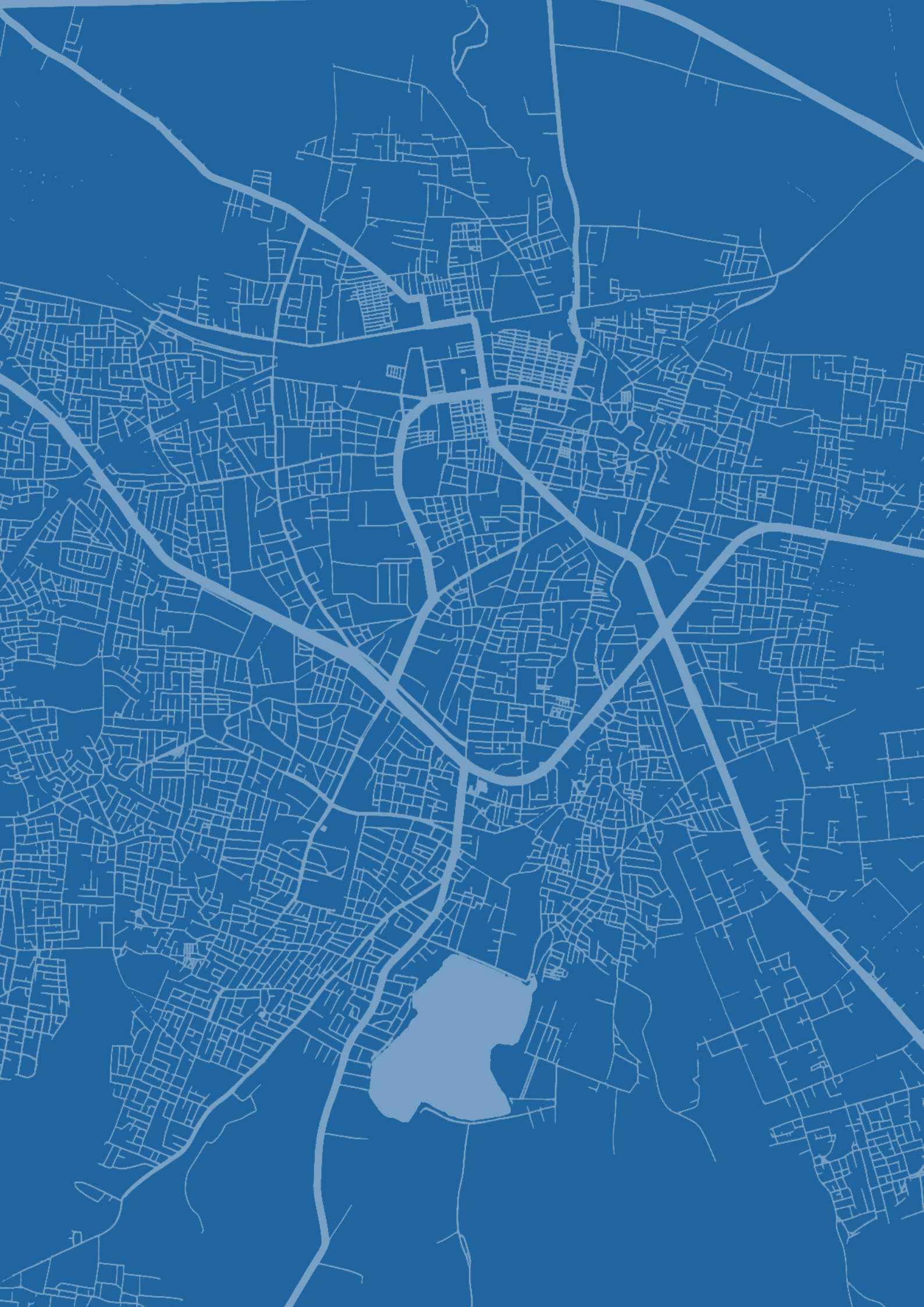


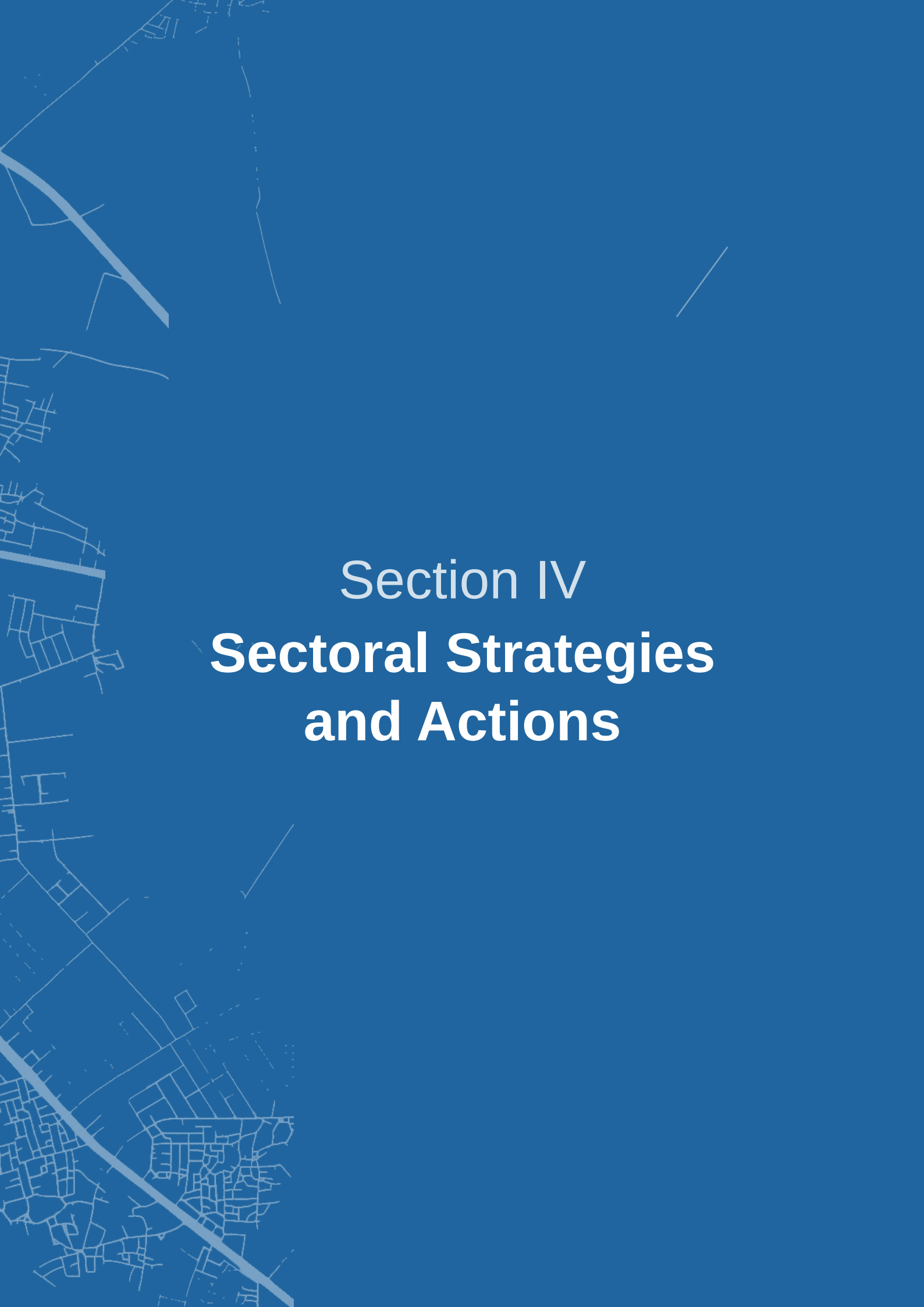
Sanitation: On average, 75% of the slum households have access to individual toilets. However, Ambedkar Nagar (5%), Siddharth Nagar (10%) have a significantly lower access to individual toilets.



Access to Water: Almost all households in the slums receive water upto 2 hours twice a week whereas, Laxmi nagar and Siddharth nagar receives water everyday, upto two hours.

Figure 52: Vulnerability parameters in informal settlements (Source: JCMC and MHT)





Section IV

Sectoral Strategies and Actions

8. Sectoral Strategies

The sectoral strategies in the Jalgaon Climate Action Plan are derived from the way the city's emissions profile and climate vulnerability patterns intersect with its core urban systems. The 2024 GHG inventory and scenario analysis identify stationary energy, transport, and waste and wastewater as the principal sources of emissions, while the climate risk and vulnerability assessment highlights heat stress, water stress, air pollution, and service gaps as priority climate risks, particularly for low-income and informal-settlement households. Together, these findings indicate that climate action must address both the performance of urban systems - efficiency, reliability, and coverage - and the distributional aspect of who benefits from improved service

On this basis, the Jalgaon Climate Action Plan organises sectoral strategies into three broad categories. System-level mitigation strategies aim to reduce emissions from essential urban services by enhancing energy efficiency, promoting cleaner fuels and renewable energy, strengthening public and shared mobility, and advancing scientific management of waste and wastewater. Risk-reduction and resilience strategies focus on moderating climate impacts through measures that reduce heat exposure, improve water security, enhance air quality, and reinforce critical infrastructure and municipal services in high-risk areas. Governance and implementation strategies seek to embed climate considerations within existing planning, regulatory, and coordination processes, enabling sectoral actions to be phased, monitored, and scaled in line with Jalgaon's institutional and financial capacities.

Within this framework, sectoral strategies for the six priority areas are articulated as directions for technical, behavioural, and institutional interventions. These strategies translate the analytical findings of the GHG inventory, scenario analysis, and vulnerability assessment into a structured basis for Jalgaon's transition towards a low-carbon and climate-resilient urban future.

Vision for 2070

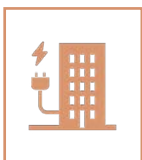
Lead Jalgaon towards a low-carbon future with inclusive growth and resilient development. This will guide Jalgaon's transition to net zero so that the city can meaningfully contribute to India's commitments to fight against climate change.

The Jalgaon Climate Action Plan has been developed as a long-term framework to guide the city's transition towards net zero while strengthening urban services and overall quality of life for residents. It recognises that Jalgaon's climate response must be integrated with its development trajectory and municipal responsibilities, and must reflect the capacities and data realities of a tier-2 city rather than function as a standalone environmental agenda.

This vision provides the overarching direction for sectoral strategies across Jalgaon's priority areas. It is underpinned by three core principles - Low-Carbon Future, Inclusive Growth, and Resilient Development - which shape how actions are identified, prioritised, and phased within the Climate Action Plan.

8.1 Key Urban Sectors for Climate Response

The Jalgaon Climate Action Plan focuses climate action on a set of priority sectors that are closely linked to the city's emissions profile, service systems, and climate risks. These sectors provide the main channels through which Jalgaon can advance its long-term vision of a low-carbon, inclusive, and climate-resilient future. Actions and targets are structured along these priority sector tracks, allowing the authority to plan, phase, and monitor climate measures in an integrated way. The following sections set out the sector-wise strategies and targets that together frame Jalgaon's pathway to net zero and enhanced resilience.



Efficient and Clean Stationary Energy

Improving energy efficiency in buildings and services, expanding renewable and cleaner energy, and reducing emissions from key urban sources.



Low-Emission and Inclusive Mobility:

Strengthening public and shared mobility, supporting cleaner vehicles, and addressing congestion and dust along major routes.



Sustainable Solid Waste Management:

Advancing segregation at source, decentralised and scientific waste processing, and remediation of legacy waste to cut emissions.



Urban Greening & Heat Resilience:

Reducing heat exposure through shading, cool materials, and greening, with special attention to high-risk neighbourhoods and public spaces.



Sustainable Water Systems:

Building sustainable water security through conservation, reliable supply and distribution, and improved wastewater and groundwater management.



Clean Air and Pollution Control:

Lowering particulate and other pollutants through controls on dust, transport and waste burning, supported by better monitoring and action on hotspots.



Efficient and Clean Stationary Energy



Sector Overview:

Stationary energy in Jalgaon covers electricity and fuel use across households, commercial and institutional establishments, and municipal services such as water supply, sewage pumping, and street lighting. Demand is increasing as built-up areas expand, appliance ownership rises, and more residents rely on mechanical cooling and lighting to maintain comfort and productivity.

Most of Jalgaon's electricity is supplied from the state grid, with limited local generation from rooftop solar or other distributed renewable systems. This means that the city's emissions from stationary energy are largely determined by the grid emission factor and by how efficiently energy is used within buildings and public infrastructure. Within the sector, residential and commercial consumers account for a large share of total demand.

The current pattern of energy use reflects constraints of a tier-2 city: many existing buildings were constructed without systematic consideration of energy performance, municipal budgets for retrofits are limited, and households often prioritise upfront purchase cost over life-cycle efficiency. As Jalgaon grows, there is a clear opportunity to steer new development and municipal investments towards more efficient and cleaner options, to reduce long-term operating costs and supporting the city's net-zero pathway.

Ongoing initiatives, policies, and schemes:

National level

- National Solar Mission
- UJALA energy-efficient lighting programme
- BEE star-labelling programme for appliances and equipment
- India Cooling Action Plan
- Mission LiFE (Lifestyle for Environment)
- Nationally Determined Contribution (NDC) targets for non-fossil electricity capacity
- Renewable Purchase Obligation targets for distribution companies
- Energy Conservation Building Code (ECBC and ECBC-R)

State and city level

- Maharashtra Renewable Energy Policy (including solar rooftop promotion)
- Net-metering regulations for rooftop solar PV in Maharashtra
- State programmes for LED street-lighting and public-lighting upgrades

■ Key Gaps & Challenges:

- High dependence on grid electricity with limited local renewable generation capacity.
- Low penetration of rooftop solar on municipal, institutional, and residential buildings despite good solar potential.
- Limited integration and enforcement of building energy-efficiency provisions (such as ECBC) in local development controls
- Significant electricity consumption in water supply, sewage pumping, and public lighting without systematic energy audits and retrofit programmes.
- Continued use of inefficient appliances and cooling devices in households, small enterprises, and public facilities due to cost and awareness barriers.
- Incomplete and fragmented data on building-wise and end-use energy consumption, constraining planning and monitoring of interventions.
- Limited in-house technical and financial capacity within the municipality to design, procure, and manage energy-efficiency and rooftop solar projects.
- Less information on life-cycle cost savings from efficiency measures, leading to preference for lower-cost, higher-consumption technologies.

■ Recommendations:

The recommendations prioritise efficiency improvements in high-consumption municipal services and buildings, gradual integration of energy-efficient design in new development, and scaled deployment of rooftop solar and other distributed renewables. Energy audits and phased retrofits will reduce electricity use in water supply, sewage pumping, public lighting, and key institutional facilities, while updated building controls and guidance will improve performance of new construction. Municipal solarisation and facilitation of private rooftop systems will increase the share of clean electricity, lowering emissions and long-term operating costs. Funding sources for the implementation of these recommendations are as listed below:

Funding Sources:

- Central: PM Surya Ghar Yojana, EESL Building Energy Efficiency Programme / SLNP, BEE MuDSM, BEE ECBC (regulatory), PM Ujjwala Yojana
- State: Maharashtra SMART, MSKVY 2.0
- District: MahaSTRIDE
- Local: RESCO's own investment

Table 7: Recommendations for efficient and clean stationary energy

Obj. Code	Objective	Strag. Code	Strategy
SE1	Transition to Renewable energy in buildings and public infrastructure	SE1.1	Increase the share of renewable power supplied by the electricity network / DISCOM.
		SE1.2	Install rooftop solar systems on municipal buildings, schools, hospitals, and other suitable public buildings.
		SE1.3	Install solar energy systems for eligible municipal infrastructure and shared public services such as streetlights, traffic signals, transit-hub lighting, water systems, and sewage treatment plants, etc.
		SE1.4	Promote rooftop solar adoption in residential, commercial, and industrial buildings.
		SE1.5	Upgrade local distribution infrastructure to support higher renewable energy consumption and distributed generation.
SE2	Promote Energy Efficiency and Retrofit of Existing Buildings	SE2.1	Undertake energy audits of municipal, institutional, and large commercial buildings.
		SE2.2	Replace inefficient lighting, fans, pumps, motors, and cooling systems with efficient alternatives.
		SE2.3	Retrofit public and non-residential buildings with improved building envelope measures, shading, ventilation, and efficient systems.

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Draft and enforce higher Renewable Purchase Obligations (RPO) for the state DISCOM. - Establish Power Purchase Agreements (PPAs) with utility-scale renewable energy developers. - Support DISCOM-led renewable power sourcing through decentralised renewable energy projects, net metering, and open access to RE where possible.	Maharashtra Electricity Regulatory commission (MERC), DISCOM: MSEDCL (Mahavitaran), Electrical engineering department (JCMC)	M	
- Identify and inventory municipal rooftops suitable for solar deployment. - Execute installations through CAPEX or RESCO (Renewable Energy Service Company) models via PPPs.	Public Works Department (JCMC), Town planning department (JCMC), RESCO / ESCO, Electrical engineering department (JCMC)	M	
- Prepare phase-wise solar installation projects for streetlights, signals, transit hubs, water systems, and STPs. - Incorporate mandatory solar power integration clauses into tenders for new municipal infrastructure.	PWD (JCMC), Water Supply Department (JCMC), Street Lighting Department (JCMC), RESCO / ESCO	M	
- Establish single-window clearance portals to expedite net-metering approvals. - Incentivise through municipal property tax rebates for buildings with functional rooftop solar systems.	DISCOM: MSEDCL (Mahavitaran), RESCO / Solar Developers, Town Planning Department (JCMC), Property tax department (JCMC)	M	
Carry out grid modernization projects, including the installation of smart meters and automated substations.	DISCOM: MSEDCL (Mahavitaran), Electrical engineering department (JCMC)	M	
- Establish a mandate requiring periodic energy audits for commercial buildings exceeding a specific built-up area. - Track implementation through a separate energy management cell.	Electrical engineering department (JCMC), ESCO	M	
- Carry out bulk procurement of BEE star-rated appliances through centralized government portals. - Implement energy service company (ESCO) contracts for retrofitting municipal water pumping stations.	Public Works Department (JCMC), Electrical engineering department (JCMC), ESCO	M	
- Identify and inventory public buildings with high energy use intensity for priority retrofitting. - Allocate dedicated public works budgets for facade improvements and HVAC upgrades.	Public Works Department (JCMC), Electrical engineering department (JCMC) ESCO	M	

Obj. Code	Objective	Strag. Code	Strategy
SE2	Promote Energy Efficiency and Retrofit of Existing Buildings	SE2.4	Promote household-level retrofits such as LED lighting, efficient appliances, cool roofs, facade insulation, and passive cooling improvements.
SE3	Encourage Climate-Responsive and Green Building Principles New Buildings	SE3.1	Ensure compliance with ECBC in applicable new buildings.
		SE3.2	Promote adoption and enforcement of Eco Niwas Samhita in new housing developments.
		SE3.3	Integrate passive design measures such as orientation, shading, natural ventilation, daylighting, cool roofs, and efficient building envelopes into new development.
SE4	Clean Thermal Energy Transition	SE4.1	Promote solar water heaters in buildings with high hot-water demand, like hotels, hospitals, hostels, institutional campuses, in new buildings and retrofits.
		SE4.2	Promote efficient electric and heat-pump water-heating systems in new apartments and institutional kitchens.
		SE4.3	Shift household and institutional cooking and heating from wood, coal, and biomass to LPG, PNG, or electricity where feasible.
		SE4.4	Prioritise access to clean cooking and heating options for low-income and vulnerable households.

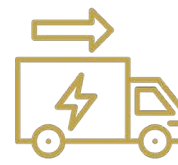
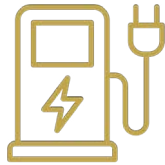
Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Launch public awareness campaigns and subsidy programs for cool roof coatings. - Partner with state energy agencies to distribute subsidized LED bulbs and efficient appliances.	MSEDCL (Mahavitaran), Electrical engineering department (JCMC)	M	
- Ensure compliance of ECBC as per UDCPR in new buildings through compliance checklists, plan approvals and ECBC certificates - Implement a retrofitting enforcement for existing properties at the time of redevelopment.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	M	
- Incorporate Eco Niwas Samhita guidelines into the Unified Development Control and Promotion Regulations (UDCPR). - Capacity building of town planning department on compliance verification during layout sanctions.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	M	
Amend UDCPR to mandate specific passive design features for high-density residential developments.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	M	A
- Amend UDCPR to mandate solar water heating systems in commercial building approvals specifically for buildings with higher builtup than 2000 sq mt, hospitals and hotels. - Enforce compliance through inspections prior to issuing operating licenses for hotels and hospitals.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra Solar water heater suppliers	M	
Amend UDCPR to mandate efficient electric and heat-pump water-heating systems in new apartments and institutional kitchens	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra Solar water heater suppliers	M	
- Expand Piped Natural Gas (PNG) distribution networks through city gas distribution utilities. - Carry out targeted transition programs in institutional kitchens (e.g., schools, prisons) to mandate electric/LPG cooking.	Health Department (JCMC), PWD (JCMC), LPG / PNG / electric service providers	M	
- Identify low-income neighborhoods and coordinate with central schemes (e.g., PMUY) to distribute subsidized LPG connections. - Develop micro-financing models through self-help groups (SHGs) for induction cookstove adoption.	Health Department (JCMC), General Administration Department (JCMC), State welfare agencies	M	

Obj. Code	Objective	Strag. Code	Strategy
SE4	Clean Thermal Energy Transition	SE4.5	Undertake awareness campaigns on the health, economic, and environmental benefits of clean thermal energy use.
		SE4.6	Shift crematorium fuel use from wood and dung cakes to cleaner fuels such as LPG, PNG, or electricity.
SE5	Industrial and Construction Materials Decarbonisation	SE5.1	Conduct energy audits and improve energy efficiency in MSMEs and industrial units.
		SE5.2	Promote renewable energy, electrification, and cleaner production in industrial estates and manufacturing units.
		SE5.3	Encourage cleaner thermal systems and fuel substitution in industrial operations.
		SE5.4	Promote low-carbon and recycled materials in construction
		SE5.5	Connect construction and demolition waste recovery systems with local construction material supply chains and public procurement.
SE5	Governance	SE6.1	Build the capacity of approving authorities, architects, and developers for effective implementation and compliance verification.

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
Run community outreach, demonstration pilots, and IEC campaigns	Health Department (JCMC), General Administration Department (JCMC)	M	
- Carry out capital projects to upgrade existing municipal crematoriums with electric or PNG furnaces. - Write regulations restricting traditional wood pyres in newly developed cremation grounds.	Health Department (JCMC), Public Works Department (JCMC),	M	
Use subsidized audit programs, energy efficiency financing, and technical support through industry associations.	General Administration Department (JCMC), ESCO / Energy audit firms, Industrial units	M	
- Amend industrial zoning regulations to require baseline solar installations on manufacturing sheds. - Develop common renewable energy infrastructure (e.g., solar parks) for industrial estates via SPVs.	General Administration Department (JCMC), MIDC, Maharashtra pollution control board MPCB, RESCO / Developers, Industrial units	M	
- Enforce strict emission standards through the State Pollution Control Board to disincentivize coal/coke usage. - Provide municipal tax incentives for industries upgrading to electric or PNG-based boilers.	MIDC, Industrial units, General Administration Department (JCMC), MIDC, Maharashtra pollution control board MPCB,	M	
Use green procurement specifications, material guidelines, and awareness among contractors and developers for public projects.	Public Works Department (JCMC), Town Planning Department, Builders / Developers	M	
- Develop centralized C&D waste processing plants through public-private partnerships (PPP). - Establish compliance checklists requiring contractors to submit C&D waste management plans for building approvals.	PWD (JCMC), General Administration Department (JCMC), Solid waste management department (JCMC), C&D waste recyclers / material suppliers	M	
Draft comprehensive technical manuals and standard operating procedures (SOPs) for compliance checks.	Town Planning Department (JCMC), PWD (JCMC), General Administration Department (JCMC)	M	



Low-Emission and Inclusive Mobility



Sector Overview:

Transport emissions in Jalgaon arise primarily from road-based passenger and freight movement, with two-wheelers, three-wheelers, and private cars forming a large share of the vehicle fleet, along with city buses, goods vehicles, and intermediate public transport. As the city expands and trip lengths increase, motorised travel demand is expected to grow further, reinforcing the need to strengthen low-emission mobility options.

Public and shared transport services are present but limited in coverage, frequency, and user convenience, leading many residents to rely on personal vehicles, particularly two-wheelers, for everyday trips. Walking and cycling remain important for short trips, especially for low-income households, but are often constrained by discontinuous footpaths, encroachments, and safety concerns on busy corridors.

The current pattern of dispersed development, regional connectivity roads, and mixed traffic conditions leads to congestion, longer travel times, and higher fuel consumption on key routes. At the same time, emerging electric mobility initiatives and opportunities for better public transport integration create scope for a gradual shift towards more efficient, cleaner, and more inclusive transport systems in Jalgaon.

Ongoing initiatives, policies, and schemes:

National level

- National Electric Mobility Mission Plan (NEMMP) and FAME India Scheme
- PM eBus Sewa and related urban bus modernisation schemes
- National Urban Transport Policy (NUTP)
- Dedicated schemes for urban street design and non-motorised transport under MoHUA
- National Clean Air Programme (NCAP) transport measures
- Bharat Stage VI vehicle emission norms and fuel-quality standards

State and city level

- Maharashtra Electric Vehicle Policy
- MSRTC electric bus programme for Jalgaon district (introduction of Shivai/other electric ST buses and charging depots)

- PM eBus Sewa implementation in Jalgaon, including sanction of 50 electric city buses and development of the Mehrun e-bus depot and route network.
- Jalgaon City Municipal Corporation's planned city bus network and route planning under PM eBus Sewa (18+ routes and designated bus stops identified through public feedback)

■ **Key Gaps & Challenges:**

- High share of trips made by private two-wheelers due to limited public and shared transport options.
- Inadequate coverage, reliability, and user comfort in existing city bus and shared-mobility services.
- Discontinuous, encroached, or poorly maintained footpaths and cycling facilities on key corridors.
- Mixed traffic operations leading to congestion, low travel speeds, and higher fuel consumption on major roads.
- Limited charging infrastructure and institutional readiness for scaling up electric mobility.
- Insufficient integration of land-use planning and transport planning, leading to longer trip lengths and car-/two-wheeler-dependent growth.
- Gaps in data on traffic volumes, vehicle composition, and trip patterns for detailed planning and monitoring.

■ **Recommendations:**

The transport strategy seeks to strengthen low-emission and inclusive mobility by improving city bus services, supporting a gradual transition to cleaner and electric vehicles, and enhancing walking and cycling conditions on key corridors. Priority actions include augmenting and rationalising the urban bus network, introducing or scaling up electric buses and supporting charging infrastructure, and implementing complete-street improvements with safe footpaths and crossings. Complementary measures such as better traffic management, parking regulation, and data-led planning will help reduce congestion, fuel use, and transport-related emissions while improving access for all users. Funding sources for these recommendations are as listed below:

Funding Sources:

- Central: PM e-Bus Sewa, AMRUT 2.0, PM E-DRIVE (EV charging open to eligible cities; e-bus component limited to 9 metros above 40 lakh), PM SVANidhi, DAY-NULM
- State: MSRTC, Nagarothan Mahaabhiyan, Maharashtra EV Policy 2021
- Local: PPP / gross-cost contracts, fare & parking revenue, 16th FC untied grants, CSR

Table 8: Recommendations for low-emission and inclusive mobility

Obj. Code	Objective	Strag. Code	Strategy
TR1	Public Transport Improvement and Fleet Electrification	TR1.1	Expand city and inter-city bus services to improve route coverage, service frequency, and reliability.
		TR1.2	Transition the city bus fleet to electric buses
		TR1.3	Develop or upgrade bus depots, charging bays, and other support infrastructure for e-bus operations.
		TR1.4	Strengthen access to major public transport stops through first- and last-mile connections.
		TR1.5	Upgrade bus stops, passenger information, accessibility, and interchange facilities.
TR2	Transition of Private Vehicles and Intermediate Public Transport to EV	TR2.1	Promote electric vehicle adoption among private two-wheelers and four-wheelers.
		TR2.2	Ensure compliance with EV charging provisions in building approvals and development regulations.
		TR2.3	Promote the electrification of auto-rickshaws and other para-transit modes.
		TR2.4	Set up a citywide public EV charging network at parking areas, fuel stations, institutions, and busy corridors.
		TR2.5	Encourage large employers, institutions, and commercial establishments to set fleet electrification targets.

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Conduct comprehensive mobility plan (CMP) to identify unserved corridors and optimize routing. - Procure additional bus fleets and contract private operators	Transport Department / Roads and Traffic Department (JCMC), Maharashtra State Road Transport Corporation (MSRTC), Private bus operators, Town planning department JCMC	M	
Expand the current initiative of adding the electric bus fleet in the city	Transport Department / Roads and Traffic Department (JCMC), PM e-bus / e-bus operator, MSRTC	M	
- Identify and inventory suitable municipal lands for new e-bus depot development. - Upgrade existing depots with high-capacity charging infrastructure.	PWD (JCMC), Transport Department / Roads and Traffic Department (JCMC), PM e-bus / e-bus operator	M	
- Incorporate dedicated intermediate public transport (IPT) stands in transit hub design layouts. - Execute public bicycle sharing (PBS) and e-rickshaw feeder projects at major transit nodes.	Transport Department / Roads and Traffic Department (JCMC), MSRTC, private bus operators	M	
Carry out retrofitting projects to build standardized, universally accessible bus shelters.	Public Works Department (JCMC)	M	
Launch extensive city-wide awareness campaigns promoting EV total cost of ownership (TCO) benefits.	Transport Department / Roads and Traffic Department (JCMC), private EV users, charging operators	M	
- Amend UDCPR to mandate EV charging infrastructure (conduits/capacity) in all new residential and commercial buildings. - Enforce compliance through approvals during layout sanctions.	Town Planning Department, Building Permission / Development Control section (JCMC)	M	
- Formulate scrappage policies linking the surrender of old ICE auto-rickshaws to subsidized e-auto permits. - Partner with local financial institutions to offer low-interest loans for e-rickshaw purchases.	RTO, Transport Department / Roads and Traffic Department (JCMC), auto-rickshaw unions, private operators	M	
- Identify and inventory municipal parking lots and vacant plots for charging station deployment. - Carry out installation and operation of charging networks through revenue-sharing PPP models.	Transport Department / Roads and Traffic Department (JCMC), DISCOM: MSEDCL (Mahavitaran), private charging operators	M	
- Establish voluntary corporate fleet electrification charters managed by the municipal corporation. - Provide recognition and green certifications to commercial entities achieving 100% fleet electrification.	General Administration Department (JCMC), large employers, institutions, commercial establishments	M	

Obj. Code	Objective	Strag. Code	Strategy
TR3	Encourage NMT: especially for shorter trips	TR3.1	Develop complete street corridors with continuous, safe and accessible footpaths; shaded walkways, drainage, signage and space for vending
		TR3.2	Develop cycling and safe walking infrastructure where feasible to improve last-mile access to key destinations.
		TR3.3	Redesign junctions, safe crossings, and other high-footfall areas to improve pedestrian safety.
TR4	Traffic Management and Parking Regulation	TR4.1	Establish an efficient parking management system in the city to manage current and future growth in the city; specifically in high-demand commercial and institutional areas.
		TR4.2	Manage street vending and encroachments to ensure safe pedestrian movement.
		TR4.3	Improve traffic circulation in busy corridors by managing junctions and loading / unloading operations.
TR5	Clean Urban Freight and E-Commerce Delivery Transition	TR5.1	Promote the electrification of urban goods vehicles, delivery fleets, and last-mile logistics vehicles.
		TR5.2	Reduce freight-related congestion in dense areas

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Incorporate standardized complete street design guidelines into the city's Master Plan. - Carry out pilot street redesign projects on major arterial roads through public works.	Town Planning Department (JCMC), Roads and Traffic Department (JCMC), PWD (JCMC)	M	A
- Identify high-potential non-motorized transport (NMT) corridors connecting transit hubs to commercial and educational zones. - Execute the construction of segregated cycle tracks and pedestrian plazas.	Town Planning Department (JCMC), Roads and Traffic Department (JCMC), PWD (JCMC)	M	
- Identify junctions with maximum traffic congestion and higher pedestrian accident rates - Carry out projects for installation of raised crosswalks and pedestrian islands on the identified junctions.	Town Planning Department (JCMC), Roads and Traffic Department (JCMC), Traffic Police, PWD (JCMC)	M	
Draft and implement a comprehensive city parking policy with dynamic pricing models as and where required in the city.	Roads and Traffic Department (JCMC), Traffic Police, Town Planning Department (JCMC)	M	
Identify and designate formal vending zones under the Street Vendors Act.	Town Planning Department (JCMC), Roads and Traffic Department (JCMC), Traffic Police, Town Planning Department (JCMC)	M	
Enforce time-restricted loading and unloading windows for commercial freight vehicles.	Roads and Traffic Department (JCMC), Traffic Police	M	
Carryout projects to incorporate EV charging infrastructure for heavy goods vehicles	Transport Department / Roads and Traffic Department (JCMC), logistics operators, private fleet owners	M	
Implement strict curbside loading zones for commercial frieghts.	Roads and Traffic Department (JCMC), Traffic Police, logistics operators, Town Planning Department (JCMC)	M	



Sustainable Solid Waste Management



■ Sector Overview:

Solid waste in Jalgaon consists mainly of household waste, commercial and institutional waste, and waste from markets and public spaces, with a significant fraction of organic material and a growing share of plastics and packaging. Collection coverage has expanded in recent years through door-to-door services, but segregation at source, dry-waste recovery, and scientific processing are still emerging, and a large share of waste continues to be handled through mixed collection and disposal.

Existing facilities provide partial processing capacity, but gaps in segregation, logistics, and market linkages limit the overall effectiveness of the system. Informal waste pickers and recyclers contribute to recovery of dry waste, yet their work is often insecure and not fully integrated into formal systems. Landfill sites and open dumping areas continue to pose environmental and health risks, including emissions from decomposing waste, leachate, and localised air-quality impacts.

Looking ahead, Jalgaon's solid waste sector faces a dual transition: moving from mixed collection and disposal to a segregation-led, processing-oriented system, and shifting from a linear "collect-solid waste" model to a more circular approach that values materials and energy. This requires coordinated investments in collection, processing infrastructure, regulatory enforcement, and community engagement, so that waste reduction, reuse, recycling, and safe disposal are embedded in everyday municipal practice.

■ Ongoing initiatives, policies, and schemes:

National level

- Solid Waste Management Rules, 2016
- Plastic Waste Management Rules, 2016 (and amendments)
- Swachh Bharat Mission (Urban) - municipal solid waste component
- National Framework for Door-to-Door Collection and Segregation under SBM-U

State and city level

- Maharashtra implementation guidelines for Solid Waste Management Rules and Plastic Waste Management Rules.
- State-supported funding and performance incentives for urban solid-waste management under Swachh Maharashtra / SBM-U.

- Expansion of segregated door-to-door collection and Ghantagadi-based transportation under JCMC sanitation contracts.
- Implementation of JCMC's solid waste management project, including development of transfer centres and a central processing and disposal facility.

■ **Key Gaps & Challenges:**

- Low and inconsistent segregation of waste at source across wards and user categories.
- Continued dependence on community bins and informal dumping points in some areas.
- Limited routing efficiency and monitoring for door-to-door collection and transfer of waste to processing sites.
- Insufficient capacity and utilisation of dry-waste collection centres and material recovery facilities.
- Weak formal integration of informal waste pickers and recyclers into city systems.
- Incomplete implementation of plastic-waste restrictions and promotion of alternatives in markets and institutions.
- Inadequate composting and biomethanation capacity relative to the volume of organic waste generated.
- Reliance on non-engineered or partially engineered disposal sites, with limited leachate, gas, and environmental monitoring systems.

■ **Recommendations:**

The solid waste strategy aims to build a sustainable system centred on segregation, recycling, and scientific processing. Priority actions include strengthening source segregation and door-to-door collection, phasing out community bins, and directing collected waste to decentralised dry- and wet-waste facilities. Dry-waste recovery will be enhanced through material recovery facilities and integration of informal waste pickers, while organic waste will be managed through decentralised composting and biomethanation, including bulk-generator processing. Residual waste will be handled through engineered landfills with environmental safeguards and landfill-gas management to minimise emissions.

Funding Sources:

- Central: SBM-U 2.0, 16th FC tied grants, EPR Funds, DAY-NULM
- State: Maharashtra SWM support, Nagarotthan, MPCB
- Local: SWM user charges, PPP / DBOT contracts, CSR

Table 9: Recommendations for sustainable solid waste management

Obj. Code	Objective	Strag. Code	Strategy
SWM1	Source Segregation and Collection Strengthening	SWM 1.1	Encourage at source segregation of waste.
		SWM 1.2	Strengthen door-to-door waste collection and direct transfer of waste to processing facilities
		SWM 1.3	Remove community waste bins to reduce littering and improve waste management efficiency.
SWM2	Decentralised Dry Waste Recovery and Circular Economy	SWM 2.1	Improve the sorting, collection, and recycling of dry waste, including plastics, recyclables, C&D waste, and e-waste.
		SWM 2.2	Integrate informal waste pickers and recyclers into dry-waste recovery systems.
		SWM 2.3	Strengthen the role of material recovery facilities, recyclers, and alternative-material manufacturers in a citywide circular economy system.
SWM3	Plastic Waste Reduction and Alternatives	SWM 3.1	Ban single-use plastics and promote viable alternatives.
		SWM 3.2	Ensure compliance with plastic reduction measures in markets, institutions, and commercial areas.
SWM4	Organic Waste Processing and Resource Recovery	SWM 4.1	Expand composting capacity through centralised and decentralised facilities.

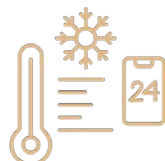
Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
• Amend solid waste bylaws to mandate systemic source segregation and link it to incentives and penalties • Conduct IEC campaigns for more awareness regarding source segregation.	Health Department (JCMC)	M	
• Procure partitioned waste collection vehicles for collecting segregated waste • Build capacity of waste collectors to identify and implement collection of only completely segregated waste. • Include RFID/ GPS tracking system to ensure 100% collection coverage.	Health Department (JCMC), private collection contractors	M	
• Carry out a phased removal of secondary storage bins across all municipal wards to make it a bin-free city.	Health Department (JCMC)	M	
• Use dry-waste collection centres, MRFs, authorised recyclers for special waste streams.	Health Department (JCMC), authorised recyclers, C&D waste recyclers, e-waste recyclers	M	
• Carry out institutionalization programs to provide occupational ID cards and safety gear to informal waste workers. • Partner with self-help groups (SHGs) or NGOs to operate decentralized dry waste sorting centers.	Health Department (JCMC), waste-picker groups / informal recyclers	M	
• Formulate municipal procurement guidelines prioritizing the purchase of recycled products (e.g., paver blocks from C&D waste). • Allocate subsidized municipal land for establishing specialized recycling projects.	Health Department (JCMC), MRF operators, recyclers, alternative-material manufacturers	M	
• Use municipal restrictions, market enforcement and procurement guidelines to implement the ban. • Establish mobile enforcement squads to conduct spot checks and levy penalties.	Health Department (JCMC), plastic alternatives suppliers	M	
• Establish compliance checklists for granting or renewing trade licenses for commercial establishments. • Carry out regular joint inspections with the State Pollution Control Board in major wholesale markets.	Health Department (JCMC), market associations, institutional users	M	
• Identify and inventory municipal parks and open spaces suitable for decentralized aerobic composting pits. • Mandate bulk waste generators (BWGs) to install in-house composting units via municipal bylaws and UDCPR.	Health Department (JCMC), composting operators	M	

Obj. Code	Objective	Strag. Code	Strategy
SWM5	Scientific Disposal of Residual Waste	SWM 5.1	Develop sanitary landfill facilities for the safe disposal of inert waste and rejects from waste processing facilities.
		SWM 5.2	Strengthen environmental management of final disposal sites through proper monitoring and control systems.

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Identify and acquire suitable peri-urban land parcels compliant with CPHEEO guidelines for sanitary landfills. - Carry out site construction, including bottom liners and leachate collection systems,	Health Department (JCMC), landfill operator / contractor	M	
- Establish standard operating procedures (SOPs) for daily soil cover and leachate treatment operations. - Deploy continuous ambient air and groundwater quality monitoring stations at the landfill periphery.	Health Department (JCMC), environmental monitoring agencies / laboratories	M	



Urban Greening & Heat Resilience



Sector Overview:

Jalgaon experiences high summer temperatures and frequent days with maximum temperatures above 40°C, with heat exposure intensified by dense built-up areas, limited shade, and low per-capita green space in many neighbourhoods. Informal settlements, high-density commercial areas, and major traffic corridors often record higher land-surface and ambient temperatures, compounding health risks for outdoor workers, street vendors, and low-income households with limited access to cooling.

Urban greening and public-space design have not kept pace with built-up growth, resulting in discontinuous tree cover along streets, under-developed parks, and few shaded walking environments. At the same time, existing health and disaster-management systems are only partially geared towards systematic heat monitoring, early warning, and targeted support for vulnerable groups. Together, these factors make urban heat a critical cross-cutting issue that links climate resilience, public health, and liveability in Jalgaon.

Looking ahead, managing urban heat in Jalgaon will require coordinated interventions that link land-use planning, street design, building practices, and public-health systems. Measures such as integrated green networks, cool-roof programmes, shaded transit and vending spaces, and better heat-wave preparedness can collectively reduce exposure, improve comfort in public spaces, and protect vulnerable residents during extreme-heat events.

Ongoing initiatives, policies, and schemes:

National level

- National Action Plan on Climate Change – National Mission for Sustainable Habitat (urban resilience and heat-stress elements)
- India Cooling Action Plan (ICAP)
- National Disaster Management Authority guidelines on heat-wave management and Heat Action Plans
- National Mission for Green India (afforestation and urban-greening support relevant to city initiatives)

State and city level

- Maharashtra State Action Plan on Climate Change (heat-stress, urban resilience, and greening focus).
- Maharashtra State Heat Wave / Heat Action Plan led by the State Disaster Management Authority, covering high-risk districts including Jalgaon.
- Tree-plantation and urban-greening drives undertaken by JCMC and partner agencies (parks, roadside plantations, and open-space development).
- Jalgaon Heat Action Plan initiatives led by JCMC and MHT, including cool-roof pilots, ward-level heat-vulnerability mapping.

■ Key Gaps & Challenges:

- High frequency of extreme-heat days with limited shaded and green public spaces, especially in dense and low-income areas.
- Fragmented and insufficient tree cover along streets, institutional campuses, and open spaces.
- Limited local monitoring of urban temperatures and heat indices across different micro-climates in the city.
- Health infrastructure and supplies not fully calibrated for heat-related illnesses, particularly during peak summer periods.
- Few systematically designed “cool spaces” such as shaded bus stops, vending zones, parks, and public plazas.
- Limited adoption of cool roofs, green roofs, and other passive cooling measures in buildings, especially in informal and low-income housing
- Inadequate integration of shading and greening requirements in street-design standards, building regulations, and land-use planning.

■ Recommendations:

The urban greening and heat strategy aims to increase per-capita green space, improve heat monitoring, and protect vulnerable communities through targeted micro-interventions. Key actions include native tree plantation along streets and compounds, development of urban forests and parks, and integration of green roofs and shading elements into building and street-design regulations. The strategy also calls for improved heat monitoring and a formal Heat Action Plan, enhanced health-system preparedness, and community-level measures such as cool roofs, shaded public spaces, cooled bus stops, vending zones, and cooling stations in high-risk areas.

Funding Sources:

- Central: Nagar Van Yojana, CAMPA, AMRUT 2.0, MGNREGA
- State: Social & Urban Forestry Dept, state greening missions
- Local: ULB parks budget, DPC / MLA-MP LAD funds, MHT & CSR

Table 10: Recommendations for urban greening & heat

Obj. Code	Objective	Strag. Code	Strategy
UH1	Increasing the per capita green space in the city	UH1.1	Native tree plantation on existing streets with ROWs $\geq 9\text{m}$.
		UH1.2	Native tree plantation along ground peripheries of compound walls in institutional and public buildings.
		UH1.3	Provisioning of dedicated tree plantation spaces within complete street sections for all new street developments.
		UH1.4	Development of Miyawaki urban forests on designated open plots across the city.
		UH1.5	Identification and development of city-level green spaces, parks, and gardens.
		UH1.6	Installation of green roofs and vertical green walls in all new building constructions.
UH2	Monitoring and maintaining the existing trees in the city	UH2.1	Detailed ward-wise tree cover analysis.
		UH2.2	Train the community women
UH3	Improving heat monitoring and warning system in the city	UH3.1	Air temperature monitoring stations to report urban heat trends.
UH4	Improving healthcare accessibility for Heat related illnesses	UH4.1	Accessibility to Urban Health Centres (UHCs) and Primary Health Centres (PHCs).

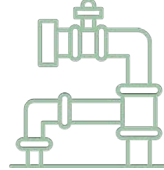
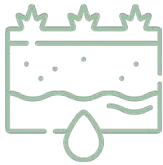
Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Carry out projects to convert existing streets into green streets, to build walkable sidewalks with shady trees. - Write regulations to mandate tree plantation along all streets in private developments.	Town planning department (JCMC), NGOs, Private consultants	M	A
- Amend Unified Development Control and Promotion Regulations (UDCPR) to mandate green compound walls for specific building typologies. - Establish compliance checklists for building plan approvals.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	M	A
- Incorporate standardized complete street design guidelines into the city's Master Plan. - Enforce compliance through approvals during layout sanctions.	Town planning department (JCMC)	M	A
- Identify and inventory suitable vacant government lands, municipal plots, and reservation spaces. - Carry out site-specific preparation and plantation projects through public works or public-private partnerships (PPP)	Town Planning department (JCMC), NGOs	M	A
- Reserve and integrate designated amenity and public utility plots directly into the land-use zoning of the Master Plan. - Formulate a phased project for park infrastructure execution and landscaping.	Town planning department (JCMC)	M	A
- Write and integrate specific green roof/ wall mandates into the UDCPR framework based on building height or plot size thresholds. - Offer regulatory incentives (such as FSI/ FAR concessions) to expedite adoption.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra, PWD (JCMC)	M	A
Conduct tree cover analysis through GIS mapping and satellite imageries	PWD (JCMC)	M	A
Training to be conducted by MHT	MHT, Community		A
- Procure and install localized IoT-enabled weather tracking sensors across strategic urban microclimates. - Build a centralized public data dashboard for real-time reporting and early warning dissemination.	MPCB Maharashtra, IMD, JCMC		A
- Conduct a spatial gap analysis comparing health center locations against severe heat-impact maps. - Set up mobile health clinics in highly vulnerable, unserved areas during peak summer months.	Town planning department (JCMC), Health department (JCMC)		A

Obj. Code	Objective	Strag. Code	Strategy
UH4	Improving healthcare accessibility for Heat related illnesses	UH4.2	Medical supply provisioning and emergency response capacity at Urban Health Centre (UHCs) and Primary Health Centre (PHCs).
UH5	Increasing resilience to urban heat for vulnerable communities through micro interventions	UH5.1	Spatial mapping of vulnerable communities for a Heat Action Plan framework.
		UH5.2	Retrofitting of existing bus stops into cool bus stops.
		UH5.3	Shaded and green public spaces.
		UH5.4	Cool roof implementations on all houses with aluminum roofing.
		UH5.5	Distributed cooling stations with dedicated maternal care spaces for outdoor laborers.
		UH5.6	Shaded vending zones for street vendors.
		UH5.7	Shading devices along sidewalks.
		UH5.8	Green traffic islands at major intersections.
		UH5.9	Water ATMs in high-vulnerability community clusters.

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Draft an institutional SOP for heatstroke emergency management. - Set up a seasonal procurement mechanism for mandatory stockpiling of intravenous fluids, ORS, and cooling packs.	Medical department (JCMC), Consultants, NGOs		A
- Conduct an integrated socio-economic and thermal vulnerability mapping study across all informal settlements. - Formulate and formally pass an urban Heat Action Plan (HAP) through the municipal general board.	Town planning department (JCMC), NGOs		A
- Carry out projects for converting existing bus stops into cool stops - Update public works department design mandates for all future transit shelter contracts.	Public Works department (JCMC), NGOs		A
- Implement an urban forestry program targeting development of public parks, open reserves, and recreational zones. - Develop public-access cool spaces or shaded plazas	Town planning department (JCMC), NGOs, forest department		A
Conduct a subsidised/funded cool-roof coating application program targeted at low-income/informal settlements.	Public Works department (JCMC), NGOs , NULM		A
- Set up cooling stations near major construction sites, industrial zones, and high-density worker hubs. - Partner with local NGOs or construction welfare boards to provide potable water, clean seating, and private breastfeeding zones.	NGOs		A
- Draft and implement a comprehensive Street Vending Policy identifying designated vending zones. - Carry out projects to cover maximum vending zones in shades	Town planning department (JCMC), NGOs, PWD (JCMC)		A
- Carry out a phase-wise project to install physical shades sails or dense canopies starting in high-pedestrian, high-heat corridors. - Incorporate shading guidelines for sidewalks into complete street guidelines	Public Works department (JCMC)		A
Carry out phase-wise projects to create shaded canopies on all major junctions (road intersections)	Public Works department (JCMC)		A
Cross-reference geographic placement of water ATMs with the HAP vulnerability maps to prioritize low-income community clusters.	Water supply Department (JCMC), Public Works department (JCMC) , NGO		A



Sustainable Water Systems



Sector Overview:

Water supply, groundwater, wastewater, and stormwater systems in Jalgaon are increasingly stressed by population growth, changing land use, and climate variability. The city depends primarily on surface-water schemes, supported by groundwater, to serve domestic, commercial, and institutional demand, but continuity, pressure, and coverage vary across wards, especially in newer or peripheral neighbourhoods. Distribution losses, limited metering, and gaps in demand management constrain both water security and the financial sustainability of service provision.

Urbanisation has reduced natural infiltration and altered drainage paths, with paved surfaces, encroachments on drains, and fragmented waterbodies weakening the city's capacity to absorb and convey stormwater. Intense rainfall events increasingly lead to localised flooding and waterlogging in low-lying and rapidly developing areas, affecting transport, damaging property, and heightening contamination risks where wastewater and on-site sanitation are not adequately managed.

In response, recommendations adopt a more integrated blue-green approach that treats lakes, wells, drains, and recharge structures as essential infrastructure. The emerging strategy combines efficiency measures - such as metering, non-revenue water reduction, and reuse - with structural and nature-based interventions including rainwater harvesting, bio-swales, retention ponds, and interlinked waterbodies, to enhance water security and reduce flood risk.

Ongoing initiatives, policies, and schemes:

National level

- Jal Jeevan Mission / AMRUT and AMRUT 2.0 support for urban water-supply augmentation and service-level improvements.
- Swachh Bharat Mission (Urban) components for wastewater and faecal-sludge management.
- National guidelines and schemes on urban flood management and stormwater drainage under MoHUA and allied agencies.

State and city level

- Maharashtra State Water Policy, guiding integrated and efficient use of surface and groundwater resources, including urban areas such as Jalgaon.

- Jalswarajya-II groundwater management and conservation measures implemented in Jalgaon district, including recharge structures and aquifer-based planning in selected watersheds.
- Jalgaon Water Supply Scheme under AMRUT, implemented by Maharashtra Jeevan Pradhikaran and JCMC for system augmentation and service improvement.

■ **Key Gaps & Challenges:**

- Intermittent and spatially uneven water-supply service, with significant non-revenue water and distribution losses.
- Limited implementation of universal metering and systematic demand-management measures.
- Incomplete adoption of rainwater harvesting, greywater reuse, and dual-plumbing provisions in actual building practice.
- Degraded or encroached lakes, open wells, and other surface-water bodies, reducing storage, recharge, and ecological value.
- Inadequate stormwater network coverage and capacity in rapidly urbanising or low-lying areas, leading to recurrent waterlogging and localised flooding.
- High proportions of impervious surfaces and limited deployment of permeable pavements, bio-swales, and retention features.
- Fragmented planning across water supply, wastewater, and stormwater, with limited application of integrated blue-green master planning.

■ **Recommendations:**

The strategy focuses on strengthening aquifer recharge, rejuvenating surface-water bodies, and improving efficiency in urban water use while reducing flood risk. Key measures include mandating rainwater harvesting and pervious-surface ratios through UDCPR, deploying bio-swales and retention ponds in waterlogging hotspots, and interconnecting urban waterbodies via a blue-green master plan. Rejuvenation of wells and lakes, including Mehrun Lake, and expansion of stormwater networks into natural channels will enhance storage and drainage. Complementary actions on metering, NRW reduction, greywater recycling, and dual-plumbing will improve overall water security and climate resilience.

Funding Sources:

- Central: AMRUT 2.0, Jal Jeevan Mission-Urban, NDMF, Atal Bhujal Yojana (rural-focused; urban eligibility unconfirmed)
- State: MJP, Nagarotthan
- Local: Water tariff & metering revenue, 16th FC tied grants, MGNREGA, CSR

Table 11: Recommendations for sustainable water systems

Obj. Code	Objective	Strag. Code	Strategy
W1	Recharge the natural aquifers	W1.1	Rainwater harvesting setups in all new and existing buildings to channel roof runoff into groundwater recharge wells.
		W1.2	Bio-swales and retention ponds in identified urban flooding hotspots.
		W1.3	Increasing permeable/pervious surface area in the city
		W1.4	Rejuvenation of defunct open wells and tube wells across the city.
W2	Rejuvenation of surface water bodies	W2.1	Spatial demarcation and area measurement of all surface water bodies (blue infrastructure) in the land-use plan to prevent encroachment.
		W2.2	Restoration and ecological conservation of Mehrun Lake and its catchment area.
		W2.3	Expansion and redirection of the stormwater drainage network into local lakes and natural channels.
W3	Efficient use of water in all new and existing buildings	W3.1	Water metering systems in all new and existing building typologies.

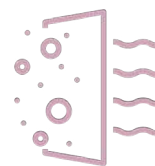
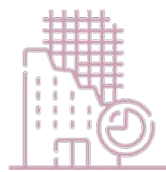
Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Update the UDCPR to mandate harvesting structures for all buildings - Implement a retrofitting enforcement for existing properties at the time of redevelopment.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra, NGO	M	A
- Map chronic waterlogging and flood-prone zones. - Carry out projects to construct swales and retention infrastructure on public streets and open plots.	Town planning department (JCMC), PWD (JCMC)		A
- Write mandatory pervious-to-impervious surface ratios into the UDCPR framework based on plot size categories. - Incorporate compliance verification into the standard municipal building plan approval checklist.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra, PWD		A
- Survey, geo-tag, and assess the structural/ water-quality status of all abandoned wells. - Allocate municipal capital for cleaning, desilting, recharging, and safety-netting selected public wells.	Town planning department (JCMC), PWD (JCMC), Water department		A
- Formally integrate high-resolution, geo-referenced boundaries of lakes and rivers into the city's statutory Proposed Land Use Plan. - Enforce strict buffer zones and non-development regulations around demarcated water bodies.	Town planning department (JCMC)		A
- Execute a comprehensive encroachment clearance drive along the lake's natural drainage inflows and peripheral pathways. - Connect natural and man-made channels to the lake	Town planning department (JCMC), PWD (JCMC)		A
Implement a phase-wise project to increase stormwater network coverage in waterlogging-prone sectors.	Town planning department (JCMC), PWD (JCMC)		A
- Introduce mandatory water meter installation clauses within the UDCPR framework for new connections. - Retrofitting mandate for existing connections, executed through the municipal water supply department.	Water planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	M	

Obj. Code	Objective	Strag. Code	Strategy
W3	Efficient use of water in all new and existing buildings	W3.2	Reduction of Non-Revenue Water (NRW) across targeted municipal sectors.
		W3.3	Decentralized greywater recycling systems in buildings exceeding 5,000 sq ft of built-up area.
		W3.4	Dual piping systems in buildings exceeding 5,000 sq ft of built-up area for secondary water reuse (flushing, landscaping, washing).

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Conduct water audits and leak detection in low-efficiency zones. - Undertake major pipeline replacement projects in high-loss clusters alongside modern pressure-management systems.	PWD (JCMC), Water supply department (JCMC)	M	
- Amend UDCPR to mandate greywater treatment plants for large commercial, residential, industrial, institutional, and public structures. - Establish building occupancy monitoring system for grey water treatment infrastructure.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra, Health Department	M	
- Embed dual-plumbing design mandates into the building code (UDCPR) for large-scale developments. - Formulate technical compliance guidelines defining plumbing layouts for secondary reuse.	Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	M	



Clean Air and Pollution Control



■ Sector Overview:

Air quality in Jalgaon is shaped by a mix of transport, construction, industrial, and area sources, with particulate matter and gaseous pollutants driven by both local emissions and regional background conditions. Road traffic, including a high share of two-wheelers and goods vehicles, contributes significantly to exhaust and non-exhaust emissions, particularly where congestion and idling are frequent along key corridors. Construction activity and material transport add further dust loads in rapidly developing areas, especially where site-management and covering practices are weak.

Industrial and commercial activities within the city and its hinterland use a range of fuels, including some higher-emission fuels, which can affect local air quality when combustion and pollution-control practices are not consistently aligned with cleaner options. Seasonal factors such as high temperatures, low wind speeds, and episodic biomass burning in the wider region can compound these sources, creating periods of elevated exposure for residents, particularly in dense and traffic-dominated neighbourhoods.

Strengthening air-quality management in Jalgaon therefore requires coordinated measures on vehicles, construction, and industry, supported by improved monitoring, enforcement, and integration with land-use and transport planning. The emerging focus is on vehicle scrappage and PUC compliance, clean-construction standards, better regulation of material transport, and a gradual shift towards cleaner fuels and electrification in industrial and commercial uses.

■ Ongoing initiatives, policies, and schemes:

National level

- National Clean Air Programme (NCAP).
- Bharat Stage VI emission and fuel-quality standards for vehicles.
- Central Motor Vehicle Rules provisions on PUC compliance and vehicle-scrappage framework.

State and city level

- Maharashtra's implementation of NCAP and related State Action Plan for Air Pollution (covering urban centres including Jalgaon).

- Maharashtra Pollution Control Board consent-to-operate and emission-control regulations for industrial and commercial establishments.
- State and district-level enforcement campaigns on PUC compliance and dust control for construction and material-transport vehicles, led by RTO, traffic police, and local bodies.

■ **Key Gaps & Challenges:**

- High contribution of road traffic to local emissions, with congestion and idling on key corridors.
- Limited scrappage of end-of-life vehicles and incomplete PUC compliance across vehicle categories.
- Inadequate controls on dust from construction sites and material-transport vehicles, including shielding and covering practices.
- Use of higher-emission fuels in industrial and commercial establishments, with uneven adoption of cleaner alternatives.
- Inadequate coverage and continuity of ambient air-quality monitoring infrastructure within and around Jalgaon, limiting the city's ability to track temporal trends, identify local hotspots.
- Limited integration of air-quality considerations into development control, transport planning, and land-use decisions, leading to continued growth of traffic and construction activity in already polluted corridors.

■ **Recommendations:**

The air-quality strategy prioritises reducing emissions from vehicles, construction, and industrial activities through targeted regulatory and enforcement measures. Key actions include scrapping end-of-life vehicles, strengthening PUC compliance and roadside checks, and adopting a comprehensive traffic-management policy to cut congestion and idling. Clean-construction codes and strict regulation of material-transport vehicles will reduce dust from building activity and haulage corridors. For industry and commerce, a clean-fuel policy and gradual electrification will phase out high-emission fuels, supported by MPCB oversight and city-level coordination to align air-quality goals with broader climate and health objectives.

Funding Sources:

- Central: NCAP
- State: MPCB, RTO
- Local: ULB enforcement & penalties, 16th FC untied grants

Table 12: Recommendations for clean air and pollution control

Obj. Code	Objective	Strag. Code	Strategy
AQ1	Reducing emissions from Vehicles	AQ1.1	Scrapping of end-of-life vehicles older than 15 years.
		AQ1.2	Strict compliance monitoring for Pollution Under Control (PUC) certificates across all vehicular categories.
		AQ1.3	Congestion management to reduce localized traffic bottlenecks and vehicular idling.
AQ2	Reducing Air pollution from Construction activities	AQ2.1	Clean construction practices
		AQ2.2	Regulation of transit vehicles transporting loose construction materials (bricks, sand, aggregate, soil).
AQ3	Reducing air pollution from Industrial activities	AQ3.1	Industrial and commercial fuel transition toward cleaner alternatives or electrification.

Implementation Mechanism / Tools	Concerned Departments / Stakeholders	Mitigation	Adaptation
- Coordinate with the Regional Transport Office (RTO) to enforce deregistration of non-compliant vehicles. - Establish authorized registered Vehicle Scrapping Facilities with structured financial incentives (e.g., tax rebates on new vehicle purchases).	Jalgaon Traffic police, RTO	M	
Conduct physical roadside spot-checks with the help of traffic police	Jalgaon Traffic police, RTO	M	
Formulate and adopt a Comprehensive Traffic Management Policy	Town planning department (JCMC), Jalgaon traffic police	M	
- Formulate and append a mandatory 'Good Practices for Construction' code including mists, sprays and shieling of construction sites into the UDCPR framework. - Link compliance directly to the building plan approval stage. - Conduct surprise site-inspections with the authority to issue stop-work notices for non-compliance.	Town planning department (JCMC)	M	
- Amend bylaws to mandate dust-tight tarpaulin coverings for all material transport vehicles. - Impose heavy financial penalties and vehicle impoundment protocols for open-spillage violations along transit corridors.	JCMC, Jalgaon Traffic police, RTO	M	
Draft and notify a comprehensive Clean Fuel Policy to systematically phase out high-emission fuels.	MPCB (Maharashtra)	M	

Annexure Recommendations for JCMC

Stationary Energy		
#	Strategy	Implementation Mechanism / Tools
1	Install rooftop solar systems on municipal buildings, schools, hospitals, and other suitable public buildings.	- Identify and inventory municipal rooftops suitable for solar deployment. - Execute installations through CAPEX or RESCO (Renewable Energy Service Company) models via PPPs.
2	Install solar energy systems for eligible municipal infrastructure and shared public services such as streetlights, traffic signals, transit-hub lighting, water systems, and sewage treatment plants, etc.	- Prepare phase-wise solar installation projects for streetlights, signals, transit hubs, water systems, and STPs. - Incorporate mandatory solar power integration clauses into tenders for new municipal infrastructure.
3	Upgrade local distribution infrastructure to support higher renewable energy penetration, distributed generation, and bidirectional power flows.	Carry out grid modernization projects, including the installation of smart meters and automated substations
4	Replace inefficient lighting, fans, pumps, motors, and cooling systems with efficient alternatives.	- Carry out bulk procurement of BEE star-rated appliances through centralized government portals. - Implement energy service company (ESCO) contracts for retrofitting municipal water pumping stations.
5	Ensure compliance with ECBC in applicable new buildings.	- Ensure compliance of ECBC as per UDCPR in new buildings through compliance checklists, plan approvals and ECBC certificates - Implement a retrofitting enforcement for existing properties at the time of redevelopment.
6	Shift household and institutional cooking and heating from wood, coal, and biomass to LPG, PNG, (or electricity where feasible).	- Expand Piped Natural Gas (PNG) distribution networks through city gas distribution utilities. - Carry out targeted transition programs in institutional kitchens (e.g., schools, prisons) to mandate electric/LPG cooking.
7	Shift crematorium fuel use from wood and dung cakes to cleaner fuels such as LPG, PNG, or electricity.	- Identify low-income neighborhoods and coordinate with central schemes (e.g., PMUY) to distribute subsidized LPG connections. - Develop micro-financing models through self-help groups (SHGs) for induction cookstove adoption.

Concerned Departments / Stakeholders		Type	Funding sources	Time frame
Public Works Department (JCMC), RESCO / ESCO		Mitigation	Central: PM Surya Ghar Yojana, EESL Building Energy Efficiency Programme / SLNP, BEE MuDSM, BEE ECBC (regulatory), PM Ujjwala Yojana State: Maharashtra SMART, MSKVY 2.0 District: MahaSTRIDE Local: RESCO's own investment	Short-Term
PWD (JCMC), Water Supply Department (JCMC), Street Lighting Department (JCMC), RESCO / ESCO		Mitigation		Short-Term
DISCOM: MSEDCL (Mahavitaran), Public Works Department (JCMC)		Mitigation		Medium-Term
Public Works Department (JCMC), ESCO		Mitigation		Short-Term
Town Planning Department (JCMC), Public Works Department (JCMC)		Mitigation		Medium-Term
Health Department (JCMC), PWD (JCMC), LPG / PNG / electric service providers		Mitigation		Short-Term
Health Department (JCMC), PWD (JCMC), LPG / PNG / electric service providers		Mitigation		Medium-Term

Transportation

#	Strategy	Implementation Mechanism / Tools
1	Expand city and inter-city bus services to improve route coverage, service frequency, and reliability.	- Conduct comprehensive mobility plan (CMP) to identify unserved corridors and optimize routing. - Procure additional bus fleets and contract private operators.
2	Transition the city bus fleet to electric buses.	Expand the current initiative of adding the electric bus fleet in the city
3	Develop or upgrade bus depots, charging bays, and other support infrastructure for e-bus operations.	- Identify and inventory suitable municipal lands for new e-bus depot development. - Upgrade existing depots with high capacity charging infrastructure.
4	Strengthen access to major public transport stops through first- and last-mile connections.	- Incorporate dedicated intermediate public transport (IPT) stands in transit hub design layouts. - Execute public bicycle sharing (PBS) and e-rickshaw feeder projects at major transit nodes.
5	Upgrade bus stops, passenger information, accessibility, and interchange facilities.	Carry out retrofitting projects to build standardized, universally accessible bus shelters.
6	Set up a citywide public EV charging network at parking areas, fuel stations, institutions, and busy corridors.	- Identify and inventory municipal parking lots and vacant plots for charging station deployment. - Carry out installation and operation of charging networks through revenue sharing PPP models.
7	Develop cycling and safe walking infrastructure where feasible to improve last-mile access to key destinations.	- Identify high-potential non-motorized transport (NMT) corridors connecting transit hubs to commercial and educational zones. - Execute the construction of segregated cycle tracks and pedestrian plazas.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Transport Department / Roads and Traffic Department (JCMC), MSRTC, private bus operators	Mitigation	Central: PM e-Bus Sewa, AMRUT 2.0, PM E-DRIVE (EV charging open to eligible cities; e-bus component limited to 9 metros above 40 lakh), PM SVANidhi, DAY-NULM State: MSRTC, Nagarotthan Mahaabhiyan, Maharashtra EV Policy 2021 Local: PPP / gross-cost contracts, fare & parking revenue, 16th FC untied grants, CSR	Short-Term
Transport Department / Roads and Traffic Department (JCMC), PM e-bus / e-bus operator, MSRTC	Mitigation		Short-Term
PWD (JCMC), Transport Department / Roads and Traffic Department (JCMC), PM e-bus / e-bus operator	Mitigation		Medium-Term
Transport Department / Roads and Traffic Department (JCMC), MSRTC, private bus operators	Mitigation		Mid-term
Transport Department / Roads and Traffic Department (JCMC), Public Works Department (JCMC)	Mitigation		Medium-Term
Transport Department / Roads and Traffic Department (JCMC), DISCOM: MSEDCL (Mahavitaran), private charging operators	Mitigation		Medium-Term
Town Planning Department (JCMC), Roads and Traffic Department (JCMC), PWD (JCMC)	Mitigation		Medium-Term

Transportation

#	Strategy	Implementation Mechanism / Tools
8	Redesign junctions, safe crossings, and other high-footfall areas to improve pedestrian safety.	- Identify junctions with maximum traffic congestion and higher pedestrian accident rates - Carry out projects for installation of raised crosswalks and pedestrian islands on the identified junctions.
9	Manage street vending and encroachments to ensure safe pedestrian movement.	Identify and designate formal vending zones under the Street Vendors Act.
10	Reduce freight-related congestion in dense areas through route, timing, and curbside management.	Implement strict curbside loading zones for commercial freights.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Town Planning Department (JCMC), Roads and Traffic Department (JCMC), Traffic Police, PWD (JCMC)	Mitigation		Medium-Term
Roads and Traffic Department (JCMC), Traffic Police, Town Planning Department (JCMC)	Mitigation		Short-Term
Roads and Traffic Department (JCMC), Traffic Police, logistics operators, Town Planning Department (JCMC)	Mitigation		Long-term

Solid waste management

#	Strategy	Implementation Mechanism / Tools
1	Encourage at Mandate source segregation of waste.	- Amend solid waste bylaws to mandate systemic source seggrgation and link it to incentives and penalties - Conduct IEC campaigns for more awareness regarding source segregation.
2	Strengthen door-to-door waste collection and direct transfer of waste to processing facilities.	- Procure partitioned waste collection vehicles for collecting seggragted waste - Build capacity of waste collectors to identify and implement collection of only completely seggragated waste. - Include RFID/ GPS tracking system to ensure 100% collection coverage.
3	Remove community waste bins to reduce littering and improve waste management efficiency.	Carry out a phased removal of secondary storage bins across all municipal wards to make it a bin-free city.
4	Improve the sorting, collection, and recycling of dry waste, including plastics, recyclables, C&D waste, and e-waste.	Use dry-waste collection centres, MRFs, authorised recyclers for special waste streams.
5	Integrate informal waste pickers and recyclers into dry-waste recovery systems.	- Carry out institutionalization programs to provide occupational ID cards and safety gear to informal waste workers. - Partner with self-help groups (SHGs) or NGOs to operate decentralized dry waste sorting centers.
6	Train community to make PP Mats out of recycled plastics	Capacity Build programs, Market linkages etc.
7	Ban single-use plastics and burning of plastic waste.	Use municipal restrictions, market enforcement, procurement guidelines, and awareness on reusable alternatives.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Health Department (JCMC)	Mitigation	Central: SBM-U 2.0, 16th FC tied grants, EPR Funds, DAY-NULM State: Maharashtra SWM support, Nagarotthan, MPCB Local: SWM user charges, PPP / DBOT contracts, CSR	Short-term
Health Department (JCMC), private collection contractors	Mitigation		Short-term
Health Department (JCMC)	Mitigation		Short-term
Health Department (JCMC), authorised recyclers, C&D waste recyclers, e-waste recyclers	Mitigation		Medium-term
Health Department (JCMC), waste-picker groups / informal recyclers	Mitigation		Medium-term
Health Department (JCMC), waste-picker groups / informal recyclers	Mitigation		Medium-Term
Health Department (JCMC), plastic alternatives suppliers	Mitigation		Short-term

Solid waste management

#	Strategy	Implementation Mechanism / Tools
8	Ensure compliance with plastic reduction measures in markets, institutions, and commercial areas.	• Use inspection drives, trade-license conditions, signage requirements, and periodic compliance checks.
9	Expand composting capacity through centralised and decentralised facilities.	• Use ward-level composting units, community composting, decentralised processing, and municipality-supported O&M contracts.
10	Develop sanitary landfill facilities for the safe disposal of inert waste and rejects from waste processing facilities.	• Use engineered landfill development, cell-wise operations, and municipal/regional landfill planning.
11	Strengthen environmental management of final disposal sites landfill through proper monitoring and control systems.	• Use leachate control, groundwater monitoring, site fencing, weighbridges, and regular environmental audits.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Health Department (JCMC), market associations, institutional users	Mitigation		Medium-term
Health Department (JCMC), composting operators	Mitigation	Central: SBM-U 2.0, 16th FC tied grants, EPR Funds, DAY-NULM State: Maharashtra SWM support, Nagarotthan, MPCB Local: SWM user charges, PPP / DBOT contracts, CSR	Medium-term
Health Department (JCMC), landfill operator / contractor	Mitigation		Medium-term
Health Department (JCMC), environmental monitoring agencies / laboratories	Mitigation		Long-term

Urban Greening & Heat Resilience

#	Strategy	Implementation Mechanism / Tools
1	Native tree plantation on existing streets with ROWs 9m.	Carry out projects to convert existing streets into green streets, to build walkable sidewalks with shady trees. Write regulations to mandate tree plantation along all streets in private developments.
2	Native tree plantation along ground peripheries of compound walls in institutional and public buildings.	Amend Unified Development Control and Promotion Regulations (UDCPR) to mandate green compound walls for specific building typologies. Establish compliance checklists for building plan approvals.
3	Development of Miyawaki urban forests on designated open plots across the city.	Identify and inventory suitable vacant government lands, municipal plots, and reservation spaces. Carry out site-specific preparation and plantation projects through public works or public-private partnerships (PPP).
4	Identification and development of city-level green spaces, parks, and gardens.	Reserve and integrate designated amenity and public utility plots directly into the land-use zoning of the Master Plan. Formulate a phased project for park infrastructure execution and landscaping.
5	Detailed ward-wise tree cover analysis.	Conduct tree cover analysis through GIS mapping and satellite imageries.
6	Train the community women to monitor the tree plantation for improving mortality rates.	Training to be conducted by MHT.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Town planning department (JCMC), NGOs, Private consultants	Mitigation & Adaptation	Central: Nagar Van Yojana, CAMPA, AMRUT 2.0, MGNREGA State: Social & Urban Forestry Dept, state greening missions Local: ULB parks budget, DPC / MLA-MP LAD funds, MHT & CSR	Medium-term
Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	Mitigation & Adaptation		Medium-term
Town Planning department (JCMC), NGOs	Mitigation & Adaptation		Medium-term
Town planning department (JCMC)	Mitigation & Adaptation		Short-term
PWD (JCMC)	Mitigation & Adaptation		Short-term
MHT, Community	Adaptation		Medium-term

Urban Greening & Heat Resilience

#	Strategy	Implementation Mechanism / Tools
7	Retrofitting of existing bus stops into cool bus stops.	Carry out projects for converting existing bus stops into cool stops. Update public works department design mandates for all future transit shelter contracts.
8	Shaded and green public spaces.	Implement an urban forestry program targeting development of public parks, open reserves, and recreational zones. Develop public-access cool spaces or shaded plazas.
9	Cool roof implementations on all houses with aluminum/tin/asbestos roofing.	Conduct a subsidised/funded cool-roof coating application program targeted at low-income/informal settlements.
10	Distributed cooling stations with dedicated maternal care spaces for outdoor laborers.	Set up cooling stations near major construction sites, industrial zones, and high-density worker hubs. Partner with local NGOs or construction welfare boards to provide potable water, clean seating, and private breastfeeding zones.
11	Shaded vending zones for street vendors.	Draft and implement a comprehensive Street Vending Policy identifying designated vending zones. Carry out projects to cover maximum vending zones in shades.
12	Shading devices along sidewalks.	Carry out a phase-wise project to install physical shades sails or dense canopies starting in high-pedestrian, high-heat corridors. Incorporate shading guidelines for sidewalks into complete street guidelines.
13	Green traffic islands at major intersections.	Carry out phase-wise projects to create shaded canopies on all major junctions (road intersections).
14	Water ATMs in high-vulnerability community clusters.	Cross-reference geographic placement of water ATMs with the HAP vulnerability maps to prioritize low-income community clusters.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Public Works department (JCMC), NGOs	Adaptation	Central: NDMF, 16th FC Disaster Mgmt grants, PMAY-U, NHM, DAY-NULM State: SDMF, state HAP allocations Implementer: Cool roofs and cool bus stops to be piloted by MHT Local: ULB revenue, 16th FC untied grants, CSR	Medium-term
Town planning department (JCMC), NGOs, forest department	Adaptation		Medium-term
Public Works department (JCMC), NGOs, NULM	Adaptation		Short-term
NGOs	Adaptation		Medium-term
Town planning department (JCMC), NGOs, PWD (JCMC)	Adaptation		Medium-term
Public Works department (JCMC)	Adaptation		Medium-term
Public Works department (JCMC)	Adaptation		Short-term
Water supply Department (JCMC), Public Works department (JCMC), NGO	Adaptation		Medium-term

Sustainable Water Systems

#	Strategy	Implementation Mechanism / Tools
1	Bio-swales and retention ponds in identified urban flooding hotspots.	Map chronic waterlogging and flood-prone zones. Carry out projects to construct swales and retention infrastructure on public streets and open plots.
2	Increasing permeable/pervious surface area in the city.	Write mandatory pervious-to-impervious surface ratios into the UDCPR framework based on plot size categories. Incorporate compliance verification into the standard municipal building plan approval checklist.
3	Rejuvenation of defunct open wells and tube wells across the city.	Survey, geo-tag, and assess the structural/water-quality status of all abandoned wells. Allocate municipal capital for cleaning, desilting, recharging, and safety-netting selected public wells.
4	Expansion and redirection of the stormwater drainage network into local lakes and natural channels.	Implement a phase-wise project to increase stormwater network coverage in waterlogging-prone sectors.
5	Water metering systems in all new and existing building typologies.	Introduce mandatory water meter installation clauses within the UDCPR framework for new connections. Retrofitting mandate for existing connections, executed through the municipal water supply department.
6	Reduction of Non-Revenue Water (NRW) across targeted municipal sectors.	Conduct water audits and leak detection in low-efficiency zones. Undertake major pipeline replacement projects in high-loss clusters alongside modern pressure-management systems.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Town planning department (JCMC), PWD (JCMC)	Adaptation	Central: AMRUT 2.0, Jal Jeevan Mission-Urban, NDMF, Atal Bhujal Yojana (rural-focused; urban eligibility unconfirmed) State: MJP, Nagarotthan Local: Water tariff & metering revenue, 16th FC tied grants, MGNREGA, CSR	Long-term
Town planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra, PWD	Adaptation		Long-term
Town planning department (JCMC), PWD (JCMC), Water department	Adaptation		Medium-term
Town planning department (JCMC), PWD (JCMC)	Adaptation		Long-term
Water planning department (JCMC), Urban development department (State secretariat), Directorate of Town planning and valuation, Maharashtra	Mitigation		Medium-term
PWD (JCMC), Water supply department (JCMC)	Mitigation		Long-term

Clean Air and Pollution Control

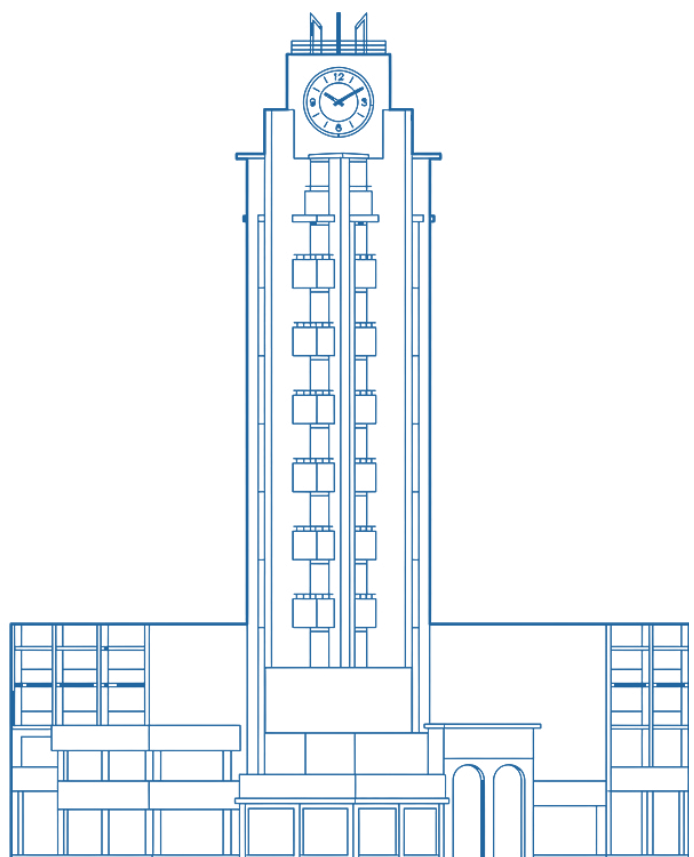
#	Strategy	Implementation Mechanism / Tools
1	Strict compliance monitoring for Pollution Under Control (PUC) certificates across all vehicular categories.	Conduct physical roadside spot-checks with the help of traffic police.
2	Clean construction practices.	Formulate and append a mandatory 'Good Practices for Construction' code including mists, sprays and shielding of construction sites into the UDCPR framework. Link compliance directly to the building plan approval stage. Conduct surprise site-inspections with the authority to issue stop-work notices for non-compliance.
3	Regulation of transit vehicles transporting loose construction materials (bricks, sand, aggregate, soil).	Amend bylaws to mandate dust-tight tarpaulin coverings for all material transport vehicles. Impose heavy financial penalties and vehicle impoundment protocols for open-spillage violations along transit corridors.

Concerned Departments / Stakeholders	Type	Funding sources	Time frame
Jalgaon Traffic police, RTO	Mitigation	Central: NCAP State: MPCB, RTO Local: ULB enforcement & penalties, 16th FC untied grants	Medium-term
Town planning department (JCMC)	Mitigation		Medium-term
JCMC, Jalgaon Traffic police, RTO	Mitigation		Short-term

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MAHILA HOUSING TRUST
Towards Responsible Urban Development

JALGAON

CLIMATE ACTION PLAN



Jalgaon City
Municipal Corporation



MAHILA HOUSING TRUST
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