



Data Lab Unboxed is an immersive exhibition, offering hands-on exposure to a range of WRI India open-access data tools.

EXPLORE THE
EXHIBITION PANELS

WRI INDIA
DATA LAB
UNBOXED

9-10 September | India Habitat Centre, New Delhi

The world's biggest development challenges demand better decisions, and better decisions begin with better data.

At WRI India, we turn evidence into impact by equipping decision-makers with powerful data, analytics and digital tools that transform complexity into clarity. We believe success comes from a straightforward process:

Count It.

Measure
What Matters

Our work is guided by timely, independent research, collecting and analysing data to diagnose the problem, assessing potential solutions, and evaluating real-world outcomes.



Change It.

Turn Insights
into Decisions

Our findings inform action on ground. We start locally, through partnerships, to pilot innovative solutions and monitor progress to learn what works and what doesn't.

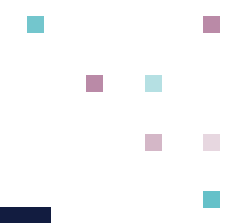


Scale It.

From Action
to Impact

We expand our impact by adapting approaches to specific needs and mobilising the needed resources, even as we ensure our learnings are accessible to all.





Get hands-on exposure to
our open-access data tools

EXPERIENCE WRI INDIA DATA LAB

01

NbS Finlink

Finding the right financial mix for your nature-based solutions (NbS) project

02

Cool Cities Lab

Mapping and analysing urban heat to arrive at appropriate cooling solutions

03

Land Suitability Analysis

Informing planning for sustainable land-use, incorporating competing priorities from development to conservation

04

Geography of Hazards

Understanding where infrastructure, jobs and people are most exposed to overlapping hazards

05

Public Spaces Assessment Framework

Understanding public spaces through the eyes of adolescents

06

Driver Network

Connecting skilling, employment and institutions across the commercial driver ecosystem

07

Transport Analytics Hub

Analysing and visualising urban transport systems to understand how people move through cities

08

E-Bus Planning & Optimisation

Optimising efficiency for e-buses and their charging infrastructure

09

Zero-Emission Bus Business Transition (ZEB-BT) Evaluator

Determining the viability of transitioning to zero-emission buses

10

Bus Scheduling Tool

Planning, scheduling and optimising bus operations for a city

11

Rapid Evaluation of Access, Coverage & Headways (REACH)

Visualising travel time, costs, transfers and accessibility to public transport

12

Transport Emission Calculator Tool (VECTOR)

Estimating air pollution and climate emissions from transport

13

Energy Access Explorer (EAE)

Visualising energy demand and supply for integrated and inclusive energy planning

14

Electrical Load due to EVs And Tariff-based Elasticity (ELEVATE)

Assessing the impact of EV charging on distribution grids for infrastructure planning and management

15

Advanced Scenarios and Carbon Emissions Navigation Tool (ASCENT)

Using local data to evaluate sectoral growth and compare emissions pathways at different scales

16

Green Economy Model for India (GEM-India)

Exploring economic and resource-use implications of India's low-carbon pathways

17

Restoration Opportunities Atlas of India

Identifying restoration opportunities using both ecological and socio-economic criteria

18

Citizen Science Application

Collecting geotagged restoration data to monitor restoration interventions

19

India Food Waste GHG Emission Estimation Tool

Estimating food waste related greenhouse gas (GHG) emissions and linked opportunities for climate action

20

Mumbai Greening Handbook

A visual guide on urban greening at all scales, from balcony gardens to large plots

21

Implementing Blue-Green Infrastructure in Bengaluru

Guidance for cities to implement urban greening and natural water systems solutions

22

Mapathon Guidebook

An online/on-site tool for identifying underutilised urban spaces for greening

23

Climate Hazard and Vulnerability Assessment (CHVA) Framework

Integrating equity into climate action by understanding differential vulnerability to urban climate hazards

Disclaimer: All maps featured in the WRI India Data Lab Unboxed exhibition are for illustrative purposes only and do not imply the expression of any opinion on the part of WRI India, concerning the legal status of any country or territory or concerning the delimitation of frontiers or boundaries. All the statistics/data contained here have been sourced from the latest publicly available datasets and official published reports. All our products carry a Creative Commons Non-Commercial No-Derivatives License (CC BY-NC-ND 4.0).

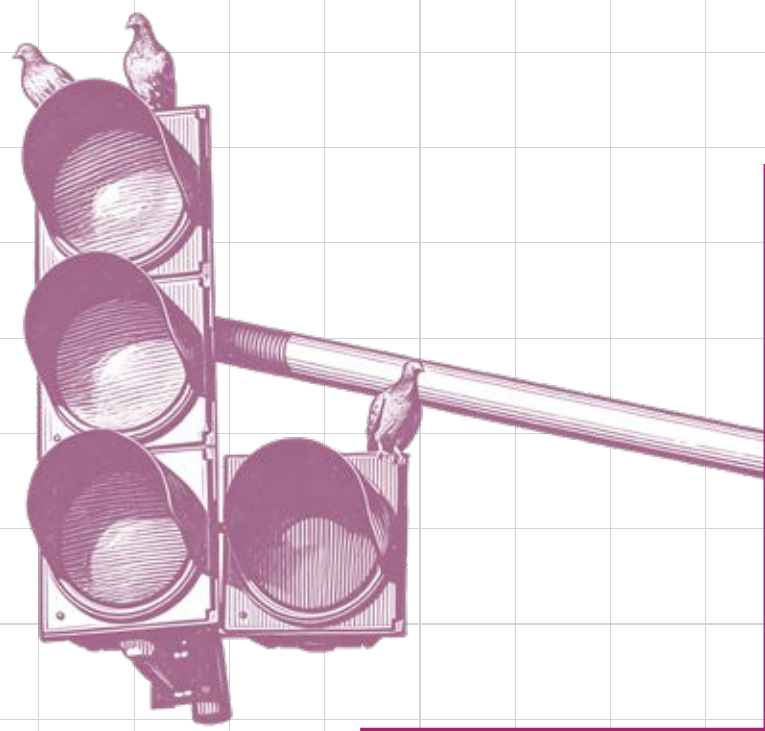


1

Transport

Shaping a future where cities work better for everyone, we collaborate with stakeholders across Indian cities to address pressing urban challenges and build inclusive, low-carbon and resilient communities.





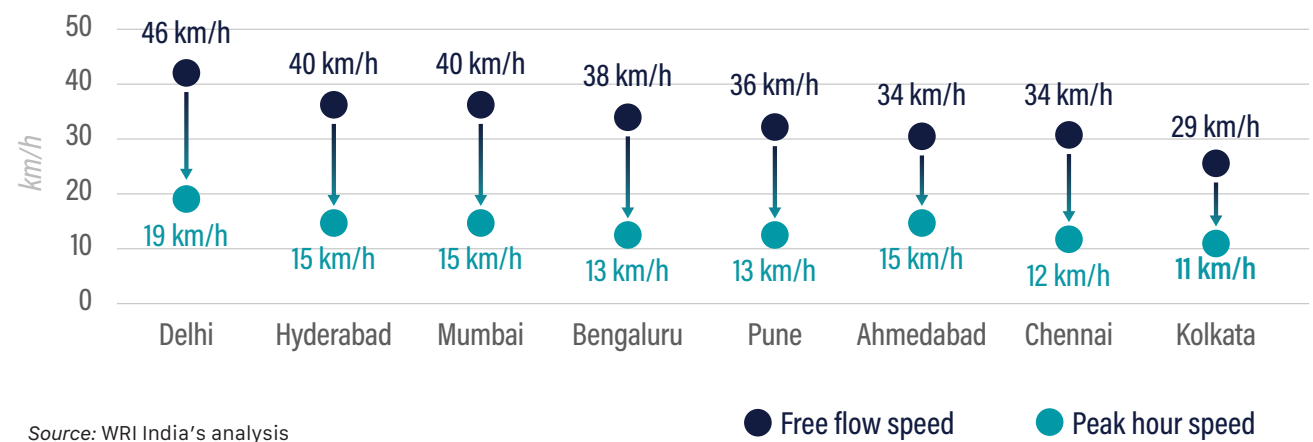
The Missing Middle Layer of Smart Road Networks

A city does not function through a handful of wider roads. It functions through a hierarchy of roads – arterial roads carrying longer-distance traffic, primary and secondary roads distributing this traffic, and local streets providing access to individual properties. Each layer of this hierarchy needs to connect for efficiency and when there are gaps, trips get forced into a few major corridors, adding to existing traffic and increasing the overall pressure on the existing network.

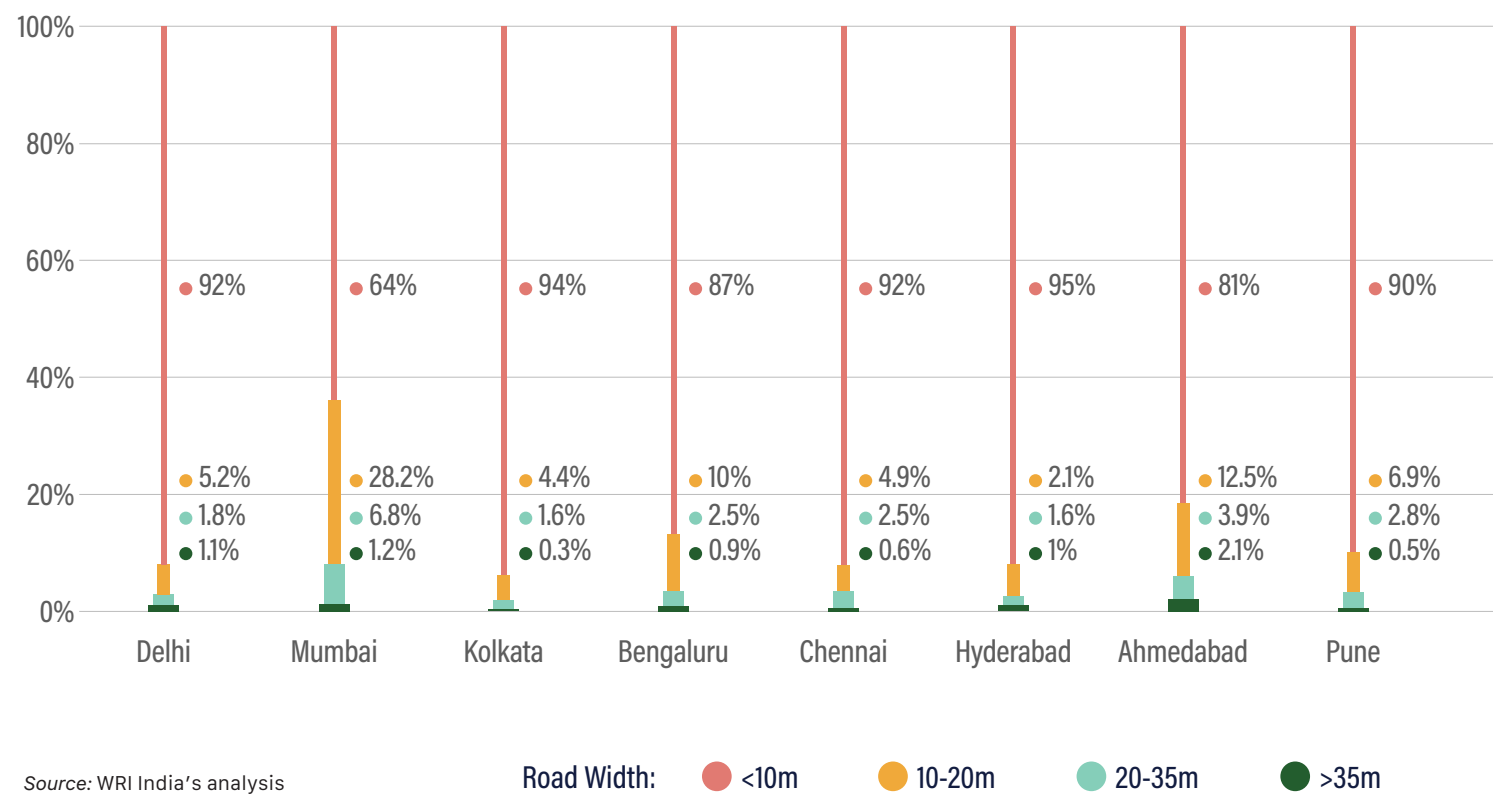


Free-flow vs. Peak-hour Speed: Tier 1 Cities

Hyderabad has a higher free-flow speed (40 km/h) than Ahmedabad (34 km/h), but both drop to 15 km/h during peak hours. The difference is not just about travel demand. Dig deeper with the **Transport Analytics Hub (TAH)** and you will see it is also because of how their road networks are structured.



Complete Street Network Composition of Tier 1 Cities



Comparing Street Networks Across Cities



AHMEDABAD



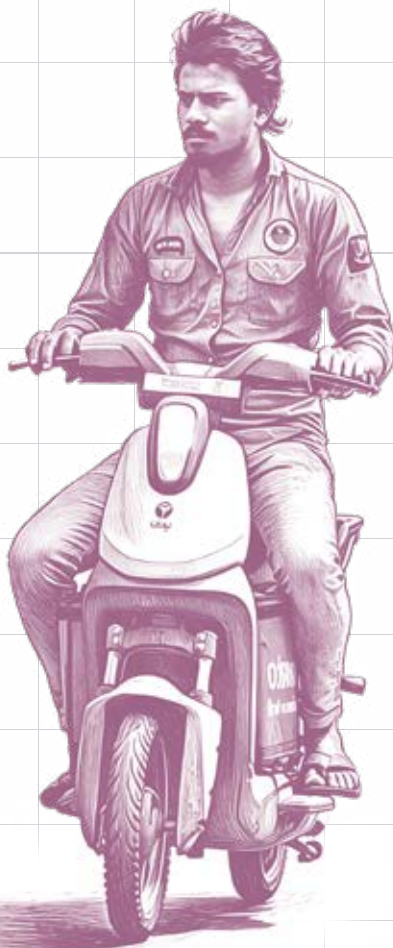
DELHI



HYDERABAD

Source: WRI India's analysis

Road Width: <10m 10-20m 20-35m >35m





Energy Transition

Facilitating India's transition to clean energy by enhancing energy access, promoting energy efficiency, and ensuring reliable energy for health, livelihoods, and education, particularly in rural areas.



From Data to Action: Delivering Energy Where It Matters Most

Reliable, affordable and sustainable energy is an enabler of economic development, disaster resilience, healthcare delivery and livelihood improvement.

Energy planners, development agencies and disaster management authorities, across India, are using the **Energy Access Explorer (EAE)** to map energy demand, solar potential and energy infrastructure. This tool is enabling authorities to direct funds, and efforts, to locations where they matter most.

EAE has helped prioritise the solarisation, of schools, healthcare facilities, streetlights, flood relief shelters and surface water lift irrigation pumps. In Jharkhand, it helped identify priority sites for healthcare solarisation, leading to reliable and affordable electricity for 250 primary healthcare centres serving approximately 9,500 in-patients daily.

In Giridih, Jharkhand, EAE enabled the identification of high-priority sites, leading to the installation of 8,000 solar streetlights. Before this, people relied on ambient light from their homes and personal lamps after sunset.

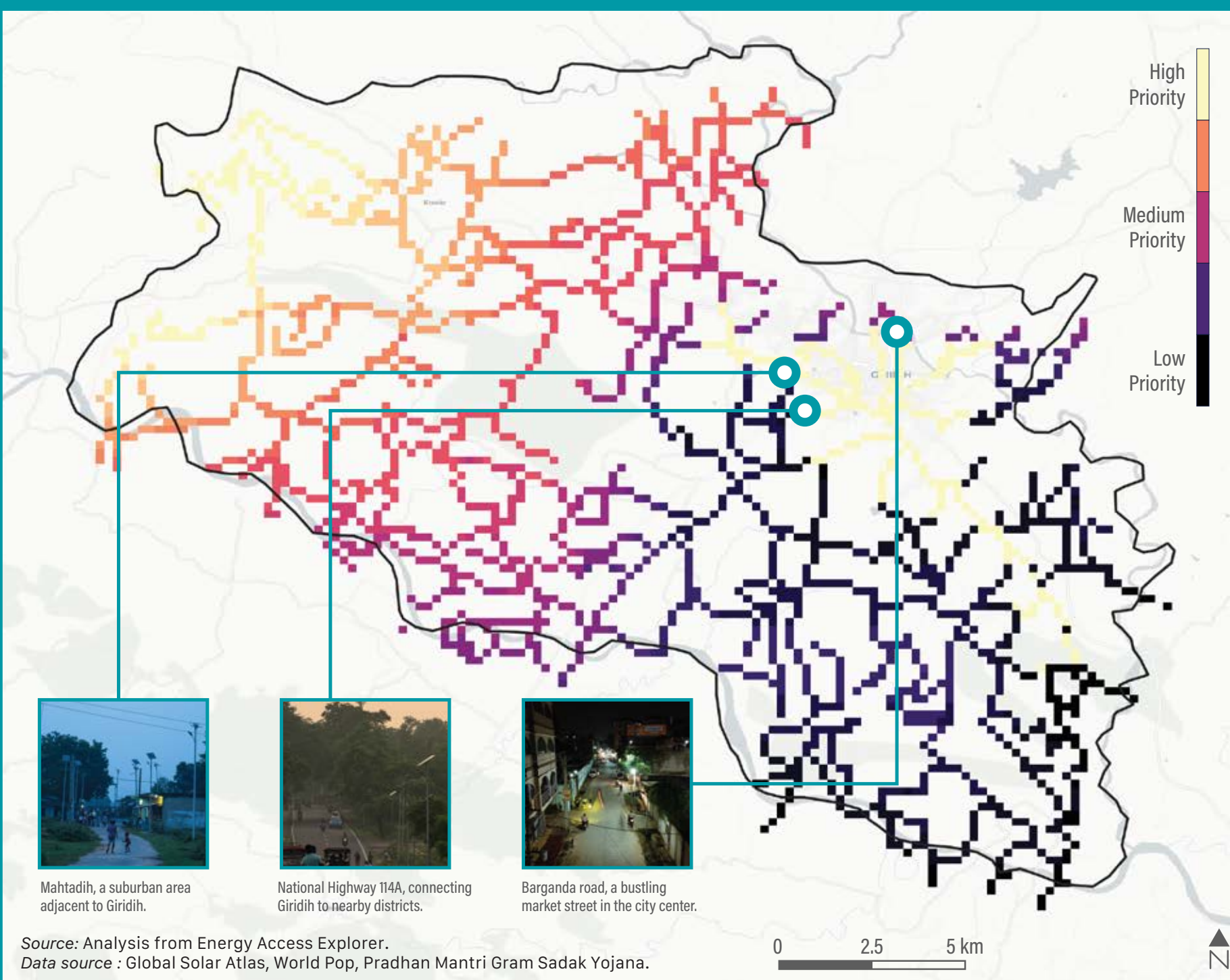


Few of the many awards and recognitions achieved by the team for EAE.

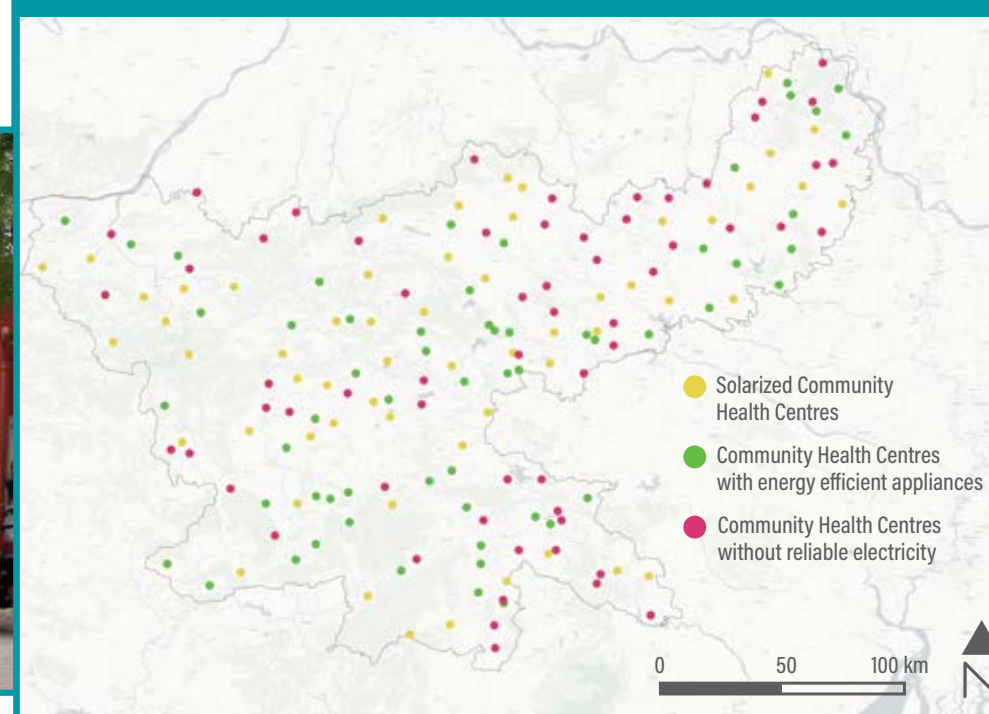


Energy Access Explorer (EAE) helped identify this public healthcare centre in Ranchi as a priority site for solarisation. *Photo credit: Dheeraj Gupta/WRI India.*

Giridih Is the First Region in Jharkhand to Be Solarised Under the Solar City Programme



Community Healthcare Centres in Jharkhand



Data Source : National Health Mission and Jharkhand Renewable Energy Development Agency for the year 2024-25.

"Earlier we had to place light bulbs outside our homes at night, but now we no longer feel the need to do so."

- A local resident of Giridih



In Mahtadih, a suburban area adjacent to Giridih, the change since the new lights went up is subtle but telling. Families and children can now be seen walking around even after night falls. *Photo credit: Akshay Ingle/WRI India.*

From Policy Choices to Better Energy Outcomes

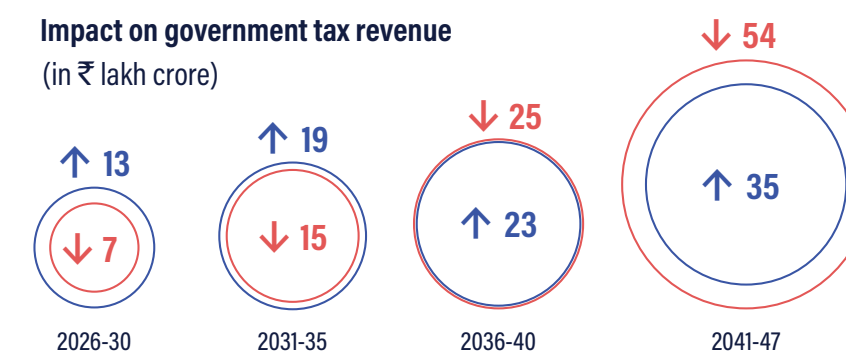
Balancing Decarbonisation With Tax Revenue

As India reduces its use of fossil fuels, it could lose crores in tax revenue

Our **Energy Policy Simulator** shows how a carbon tax could help recover 90 per cent of this revenue lost to India's clean energy transition.



Impact on government tax revenue (in ₹ lakh crore)



Note: Assuming carbon tax in electricity and industrial sectors rises linearly from ₹900 per tonne of CO₂e in 2026 to ₹3,200 per tonne of CO₂e in 2047. The 2041-47 period covers 7 years, while previous periods represent 5-year intervals. Viksit Bharat refers to India's aspiration to transform into a US \$30 trillion economy by 2047. Net Zero 2070 refers to India's climate commitment to reach net-zero emissions by 2070. All monetary values are in constant 2018 prices.

Source: Analysis based on EPS-India tool.

Energy policy decisions affect emissions, energy use, jobs, economic growth and public health, but these impacts are often assessed separately.

The **Energy Policy Simulator (EPS)** provides a way to explore these connections, translating complex policy interactions into an interactive simulation. This open-source computer model allows decision-makers and researchers to select and combine policies across sectors — transport, electricity, buildings, industry, agriculture and land use — to better understand policy trade-offs and identify combinations that deliver better outcomes.

EPS has been used for modelling net-zero pathways and their economic implications for the 'Global Climate Alliance to Accelerate Climate Action' during India's G20 presidency in 2023. More recently, it has been applied towards informing NITI Aayog's work on sectoral net-zero pathways for the power, industry and transport sectors, and various intermodel comparison exercises carried out by the Government of India's apex policy think tank.



EXPLORE MORE INFOGRAPHICS



ACCESS THE ENERGY POLICY SIMULATOR

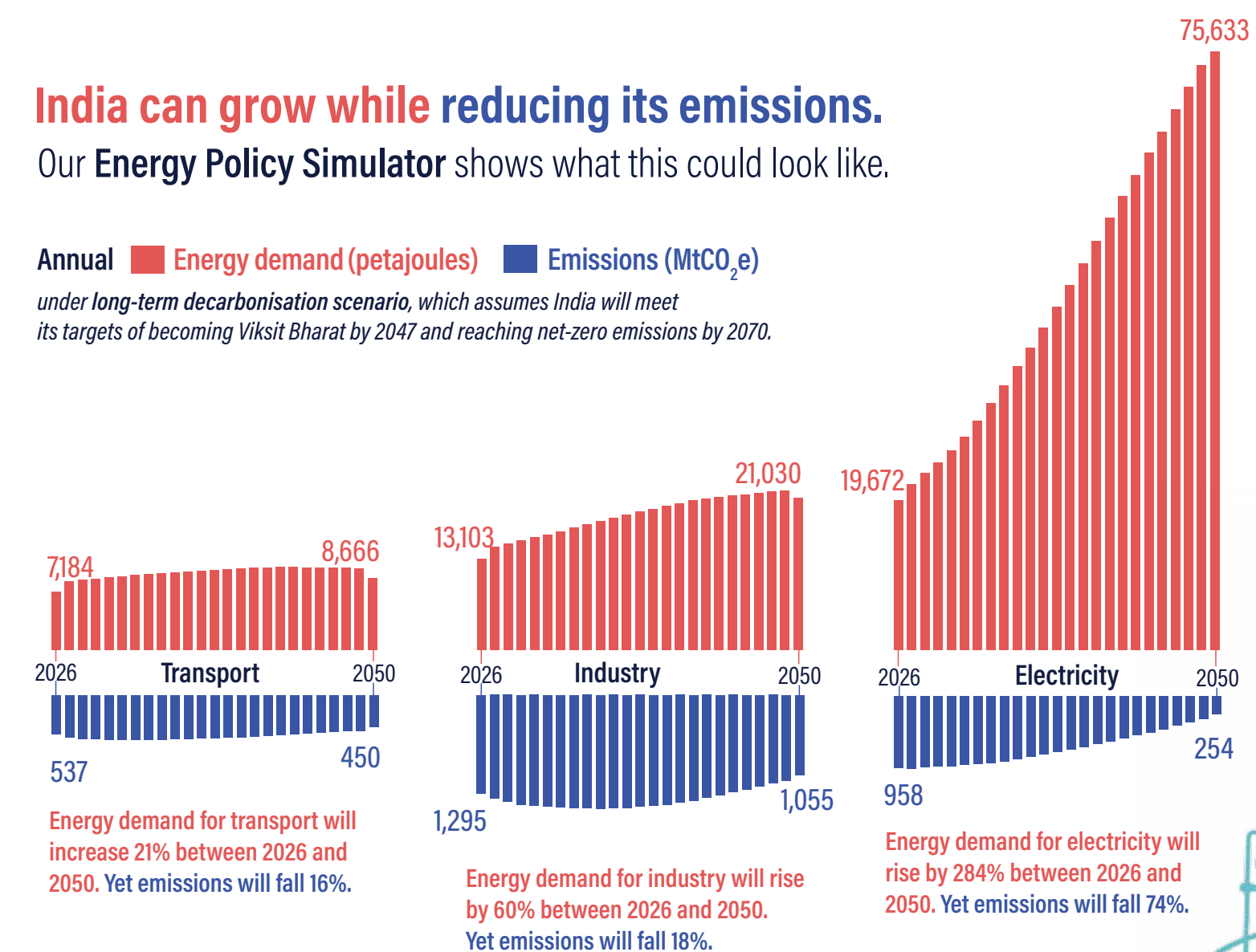
How Can India Balance Decarbonisation and Rising Energy Demand?

India can grow while reducing its emissions.

Our **Energy Policy Simulator** shows what this could look like.

Annual ■ Energy demand (petajoules) ■ Emissions (MtCO₂e)

under long-term decarbonisation scenario, which assumes India will meet its targets of becoming Viksit Bharat by 2047 and reaching net-zero emissions by 2070.



Source: Analysis based on EPS-India tool.

Climate Resilience

Working with communities to strengthen livelihoods, improve climate preparedness, promote sustainable practices, and build locally led solutions for a resilient future.





Co-designing place-based solutions. Photo credit: WRI India.

A Community-Led Blueprint for Climate-Resilient Villages



SCAN TO KNOW MORE

Tamil Nadu's Killai, located near the Pichavaram mangrove forest, is frequently affected by cyclones, leaving residents without electricity for days at a time. These recurring storms also threaten the lives, livelihoods and overall well-being of the community.

Strengthening community climate resilience, however, is not just about building resilient infrastructure – it's also about empowering people, protecting biodiversity and shaping futures that withstand uncertainty.

WRI India supported the implementation of a locally led, place-based adaptation plan for Killai in Cuddalore district under the Tamil Nadu Climate Change Mission's Climate Resilient Villages programme. This included climate vulnerability assessments through GIS mapping and design of interventions for specific locations based on geotagging. Key interventions included community-led mangrove afforestation, solarisation of public buildings, conversion of diesel boats to e-boats, and the rejuvenation of Buckingham Canal.

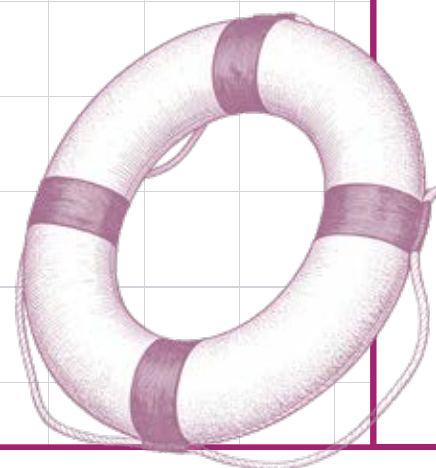
Co-created with the community and other partners, the state's first **"Climate Resilient Village"** today serves as a benchmark for 10 other villages across other climate-vulnerable districts in the state.

Spatial Visualisation of Proposed Interventions for Killai



Woman drying her fish catch in the sun. Photo credit: WRI India.





Mapping India's Multi-hazard Landscape

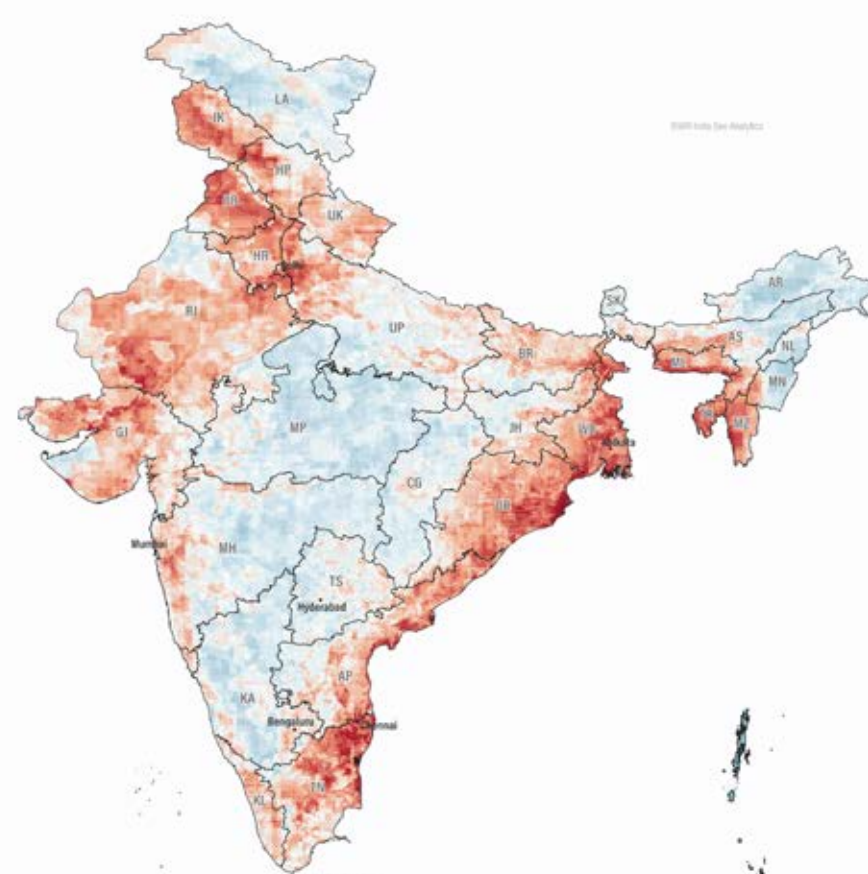
India's hazards rarely occur in isolation. Yet assessments often examine one hazard at a time, across administrative boundaries and fragmented datasets – making it harder to see where hazards overlap and where planning must respond.

The Geography of Hazards (GoH) tool changes that lens. Harmonising 14 indicators across four hazard domains – geophysical, hydrological, meteorological and environmental – using nationally available data sets, it develops a GIS-based spatial framework to identify where hazards occur and overlap, and how population, built-up area and jobs are exposed.

Therefore, it provides a national-level screening baseline of extreme-hazard count and multi-hazard screening score. It can further inform planning and decision-making; and be complemented by locally validated, site-specific evidence.

The national-level analysis indicates multi-hazard occurrence is uneven across India. The picture is striking: most prominent multi-hazard prone regions lie along the Himalayan and sub-Himalayan region, the eastern coast, parts of the northeast, and selected pockets of western and southern Indian coasts.

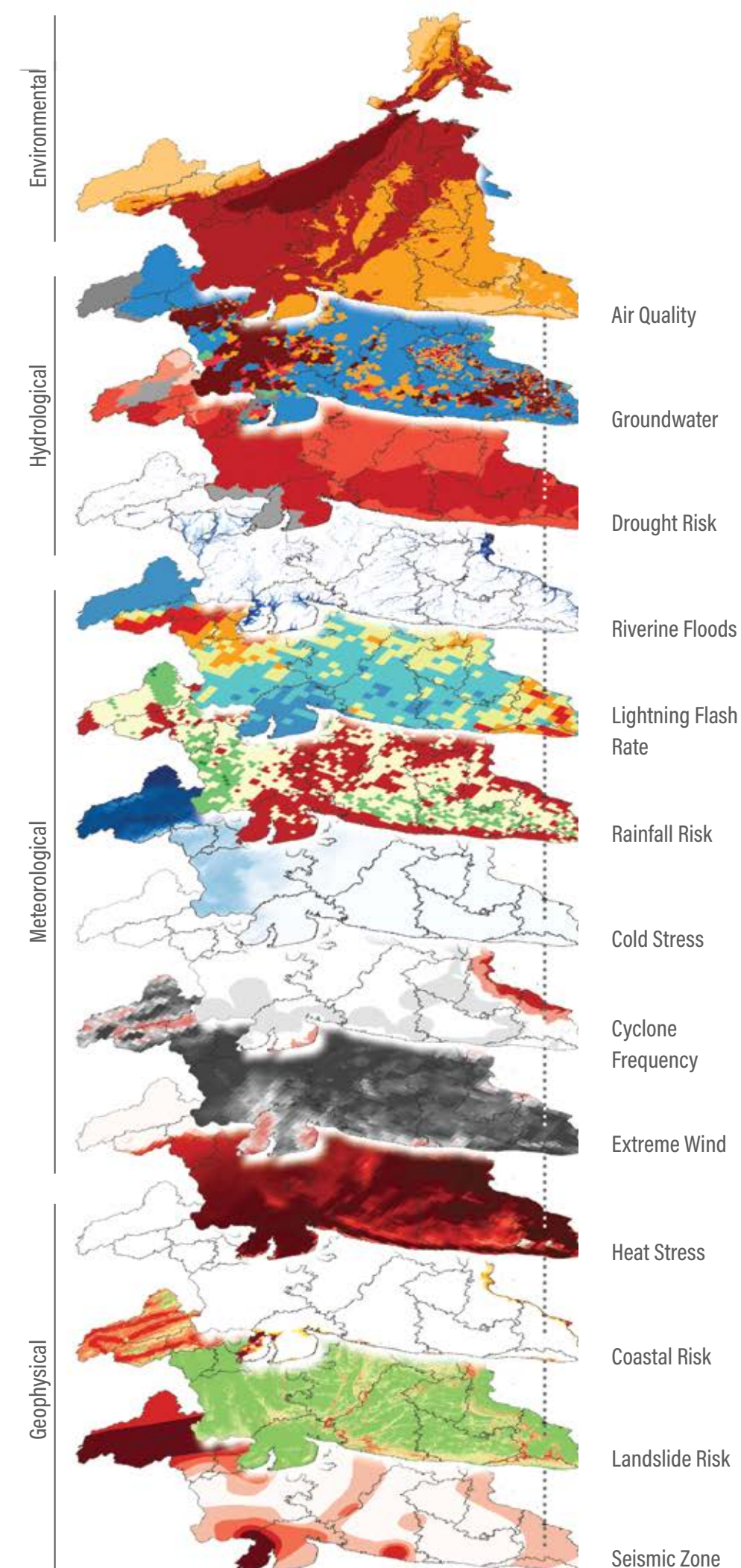
Multi-hazard Screening Score



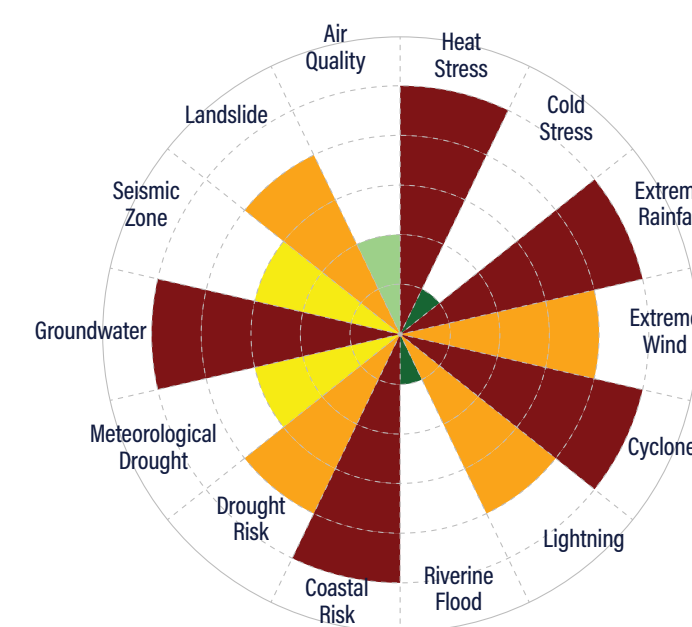
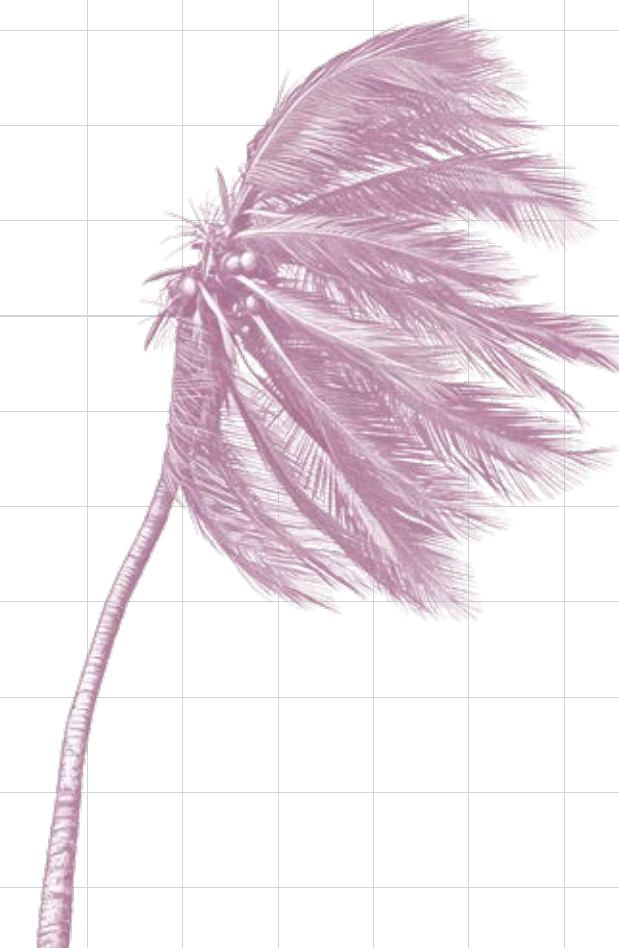
Multi-hazard Screening Score:
High Low

Source: WRI India's analysis.

Hazard Layers



This visualisation has been created using a 3D perspective and the direct use of scales should be done with caution.



The illustrative case of Chennai shows strong overlap of hazard occurrence and exposure.



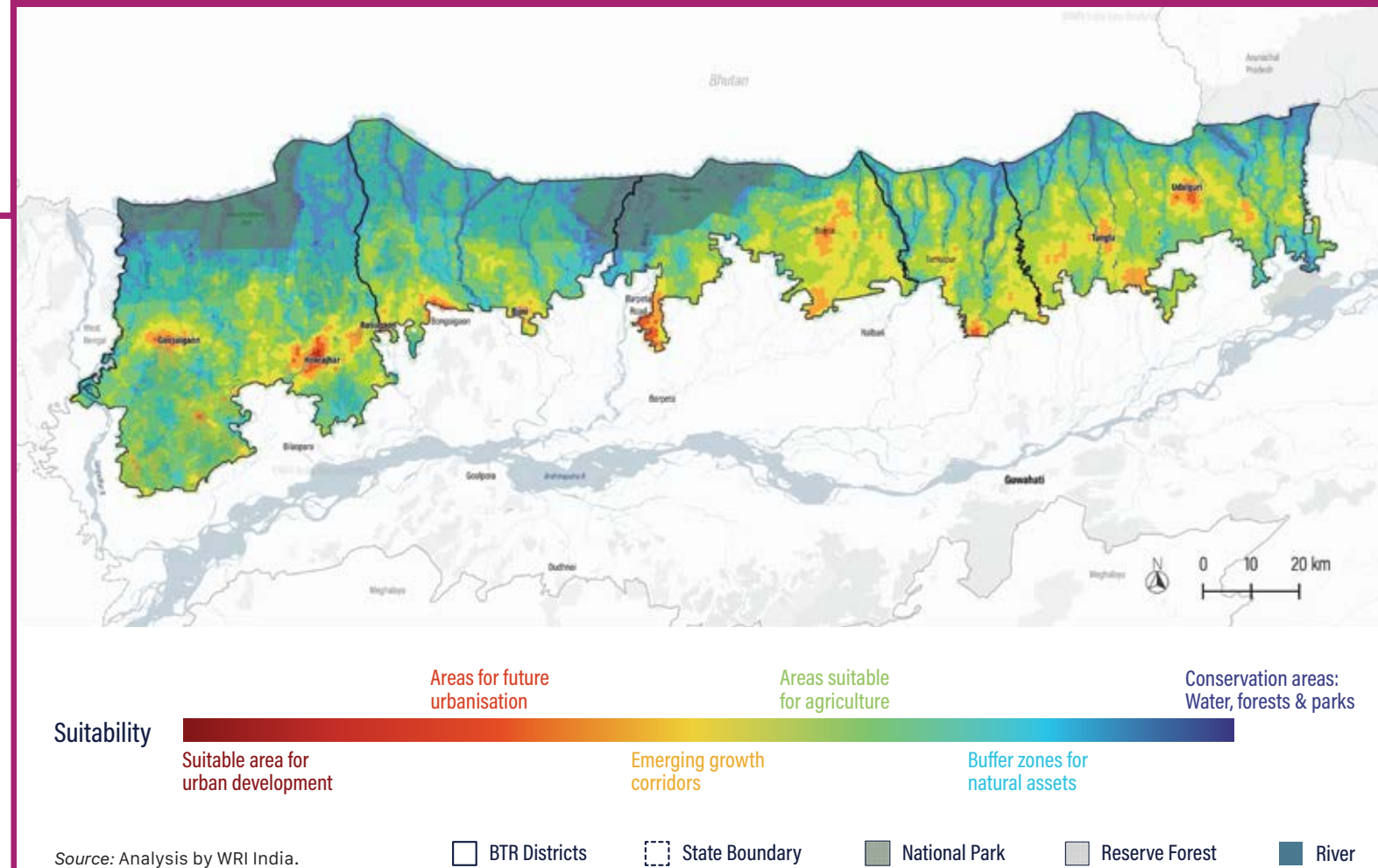
Planning for People, Nature & Climate

Rapid population and economic growth are increasing pressure on limited land resources.

The **Land Suitability Analysis (LSA) Tool** brings competing priorities from development to conservation into one spatial decision-making framework. Using GIS and multi-criteria decision-making, the tool brings together six themes – transport, economy, demography, social infrastructure, environment and climate vulnerability – to identify where different types of activities are most suitable.

The LSA informed the Regional Spatial Strategy for Bodoland (Assam) by mapping flood-prone areas, ecological buffers and wildlife corridors to guide conservation. Co-created with the Bodoland Territorial Council and vetted on ground, it also identified areas with potential for sustainable urban growth, guiding infrastructure investments based on connectivity, job proximity and social infrastructure.

Land Suitability Analysis: Case of Bodoland - Equal Weight Scenario



Saralpara picnic spot on the edges of the Saralbhangha River, which originates in the mountains of Bhutan and flows down into the Kokrajhar district. Photo credit: WRI India.

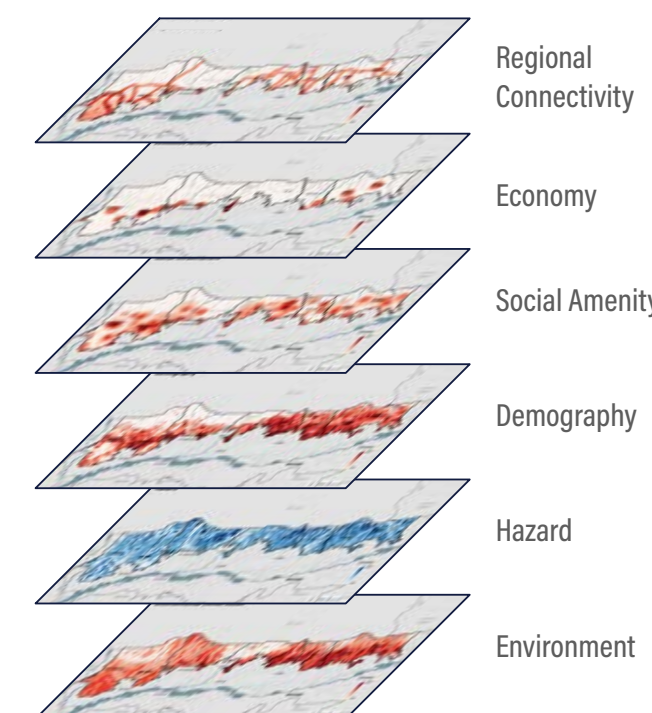


River stream bifurcating into an agricultural canal, locally called a Dong Bandh, next to a farm in Mushalpur. Photo credit: WRI India.



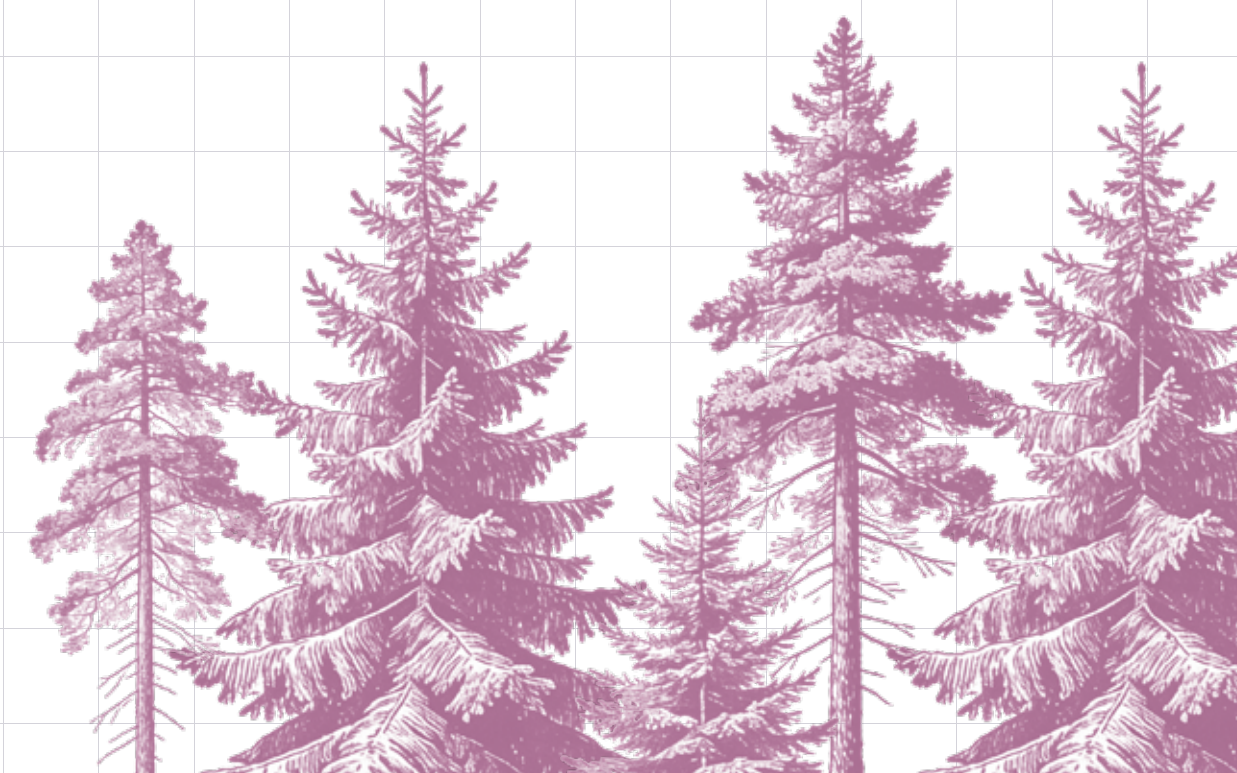
Aerial view of Udalguri town centre. Photo credit: WRI India.

Six Thematic Layers



Source: Analysis by WRI India.

This visualisation has been created using a 3D perspective and the direct use of scales should be done with caution.





From Risk to Resilience: How Geospatial Intelligence Anchored Mumbai's Climate Action Journey

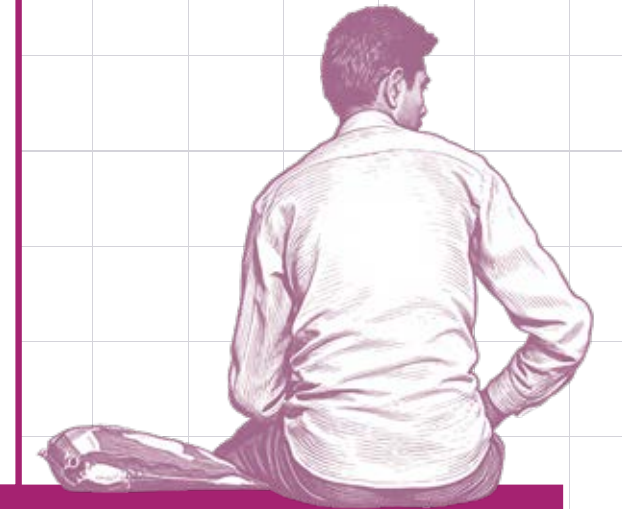
WRI India's **Climate Hazard and Vulnerability Assessment (CHVA)** turns complex climate data into a neighbourhood-level picture of risk—revealing where Mumbai's communities are most vulnerable and providing the evidence base for the Mumbai Climate Action Plan (MCAP).

By bringing different layers of spatial data — heat, flooding and coastal risks, and exposure data on population, jobs and critical infrastructure — and overlaying it with socioeconomic vulnerability — the CHVA helps the city understand not just where climate risks are greatest, but where action is most urgently needed.

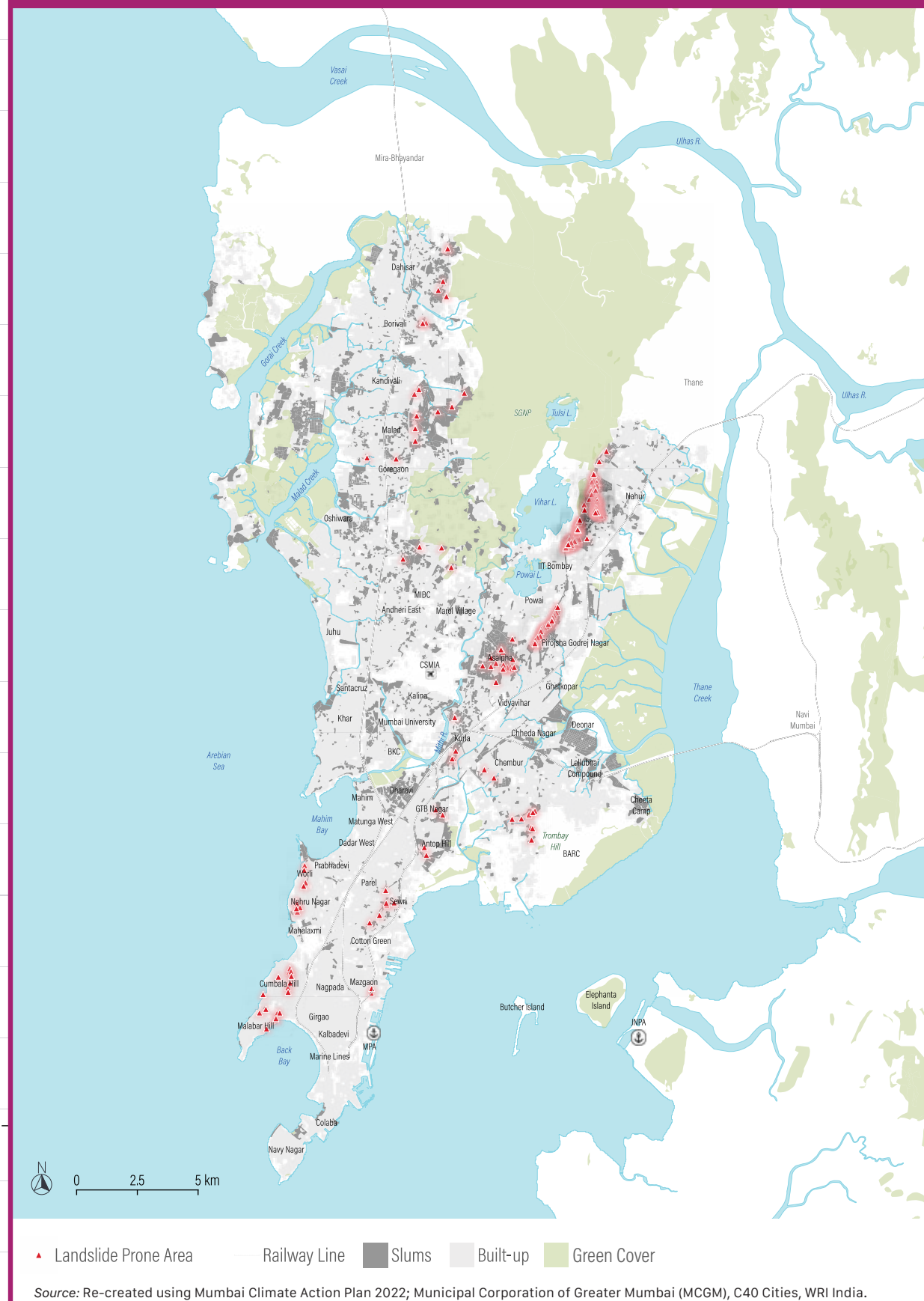
The evidence is now translating into action on the ground. The city published India's first municipal Climate Budget Report and established a dedicated Environment and Climate Change Department within the BMC, turning climate action from a standalone agenda into a core part of urban governance.

In collaboration with the BMC Gardens Department, educational institutions and other partners, a citywide mapathon across six wards identified more than 600 acres of potential land for greening. Ward-level visioning workshops are now taking this ahead, using spatial evidence to shape greening plans tailored to local needs.

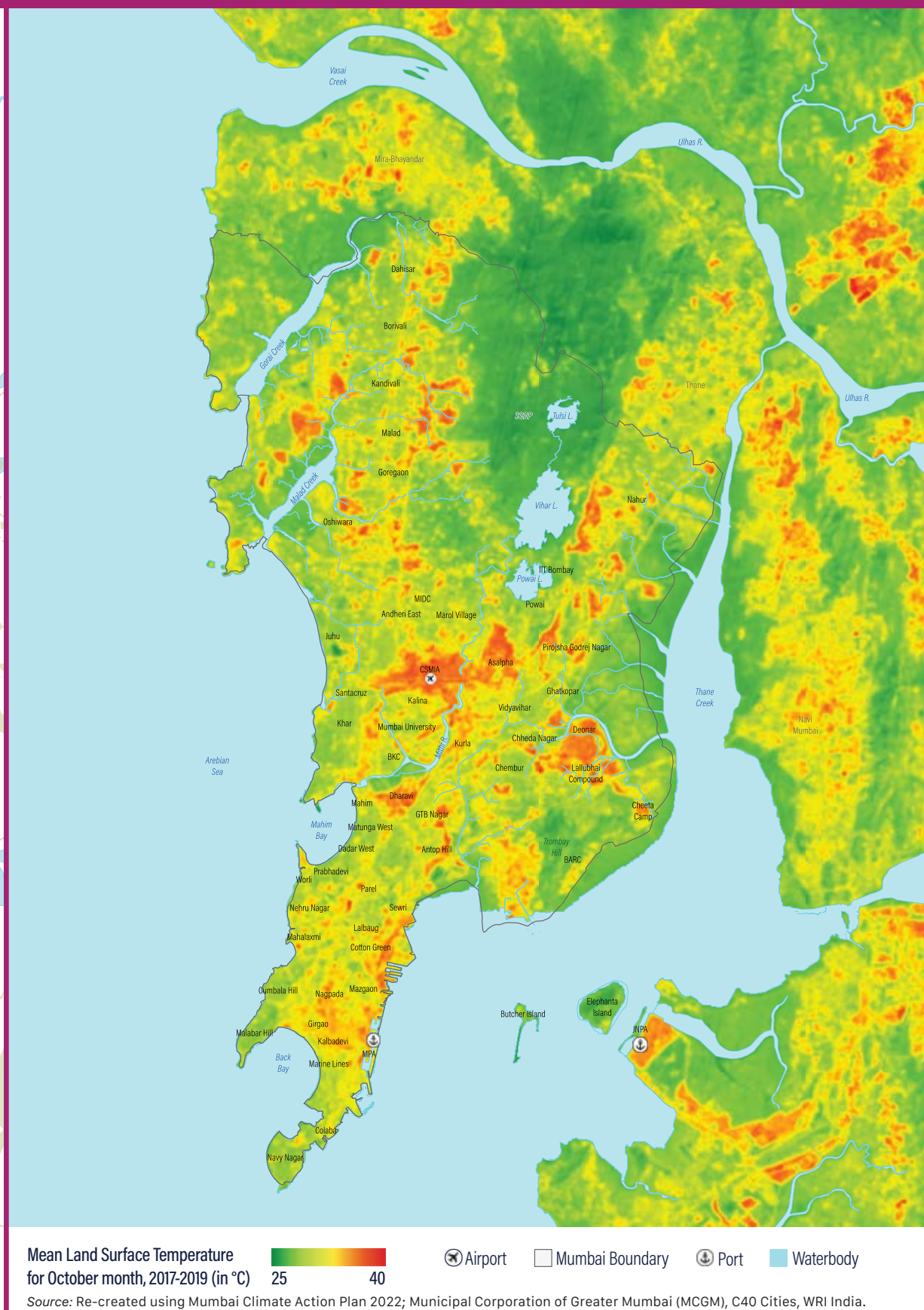
Today, more than 12 pilot projects, including the Marol Urban Forest and the Lallubhai Compound greening initiative, are demonstrating how science-based, community-led solutions can tackle multiple climate challenges at once, from extreme heat and water management to biodiversity and equitable access to green spaces.



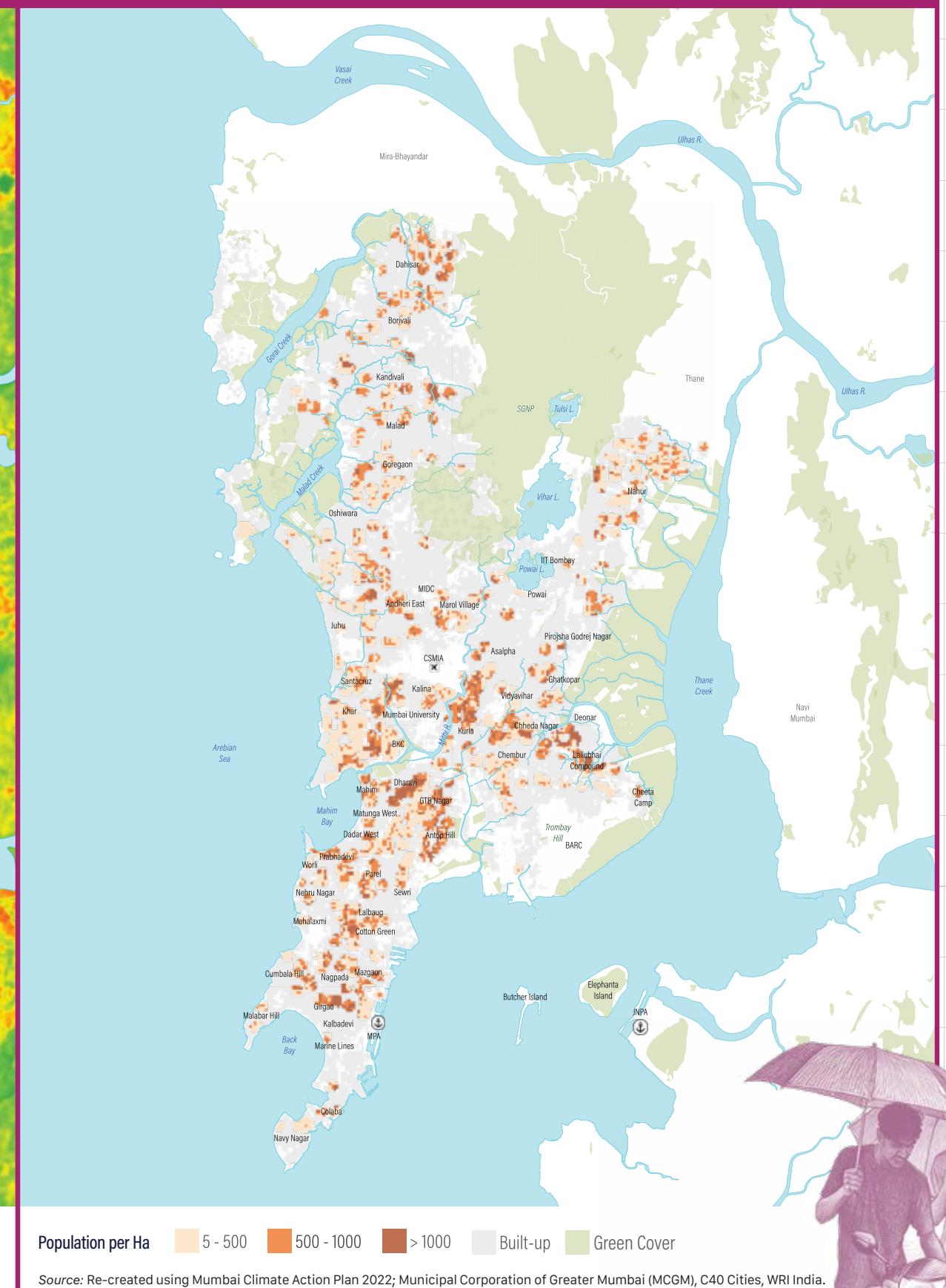
Landslide Prone Locations and Informal Settlements



Land Surface Temperature



Population Residing Within Waterlogging Hotspot Zones



Food & Land Use Systems

Accelerating India's transition towards
a land-based restoration economy for
sustainable and resilient food and
land use systems.

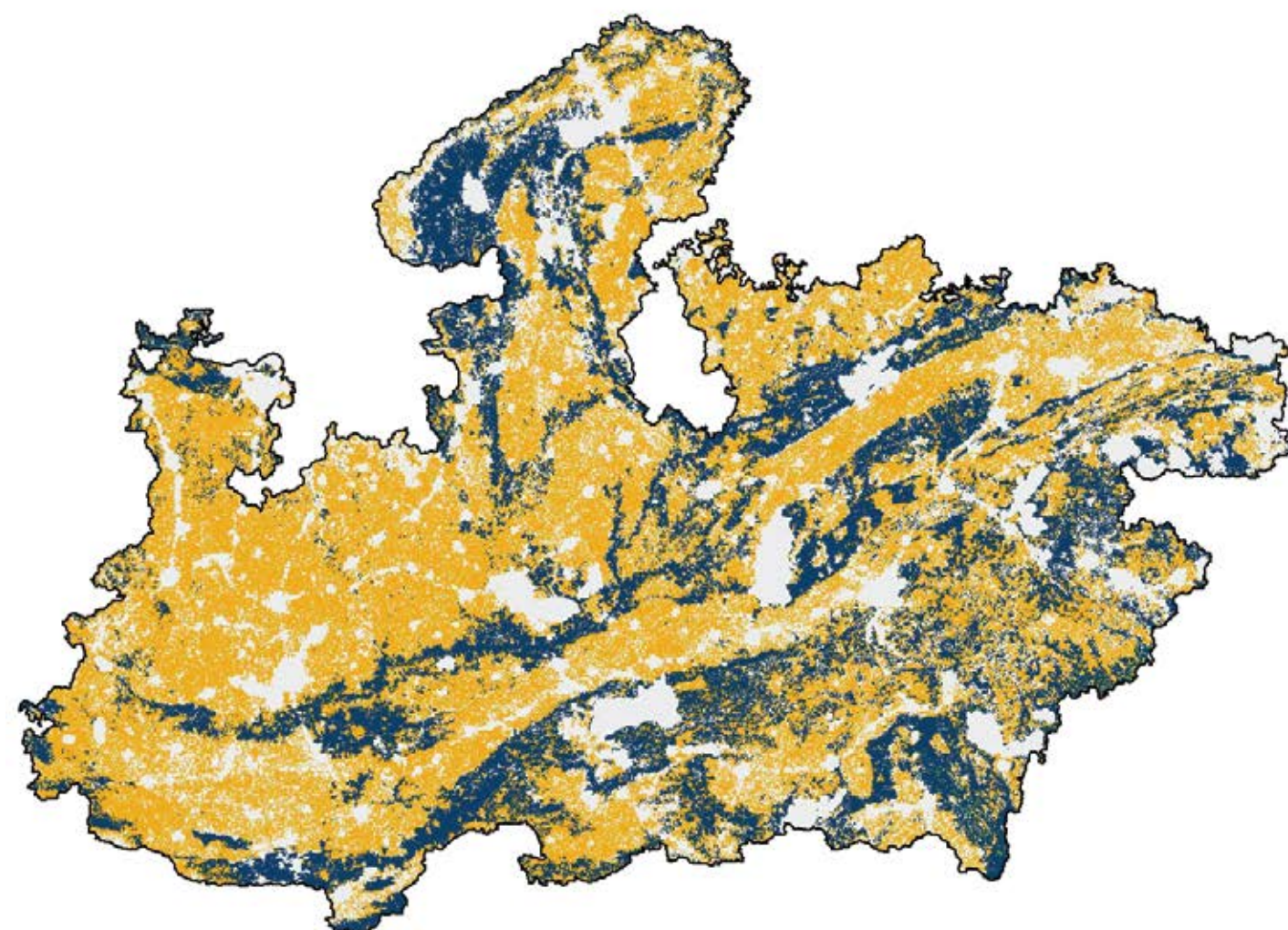




"With healthier land and better yields, we are able to send our children to school"

- **Shakuntala Singh**,
Dandi village in Sidhi District,
Madhya Pradesh

Landscape Restoration Opportunities in Madhya Pradesh



Protection Wide-scale Restoration Mosaic Restoration Excluded Areas

Map not to scale.

Source: Singh et al. (2020)



A top view of the flourishing landscape, with a dug well for irrigation, in Dandi village of Sidhi district. Photo credit: WRI India.

Mapping Restoration, Unlocking Opportunities

Putting data and communities at the heart of landscape restoration.

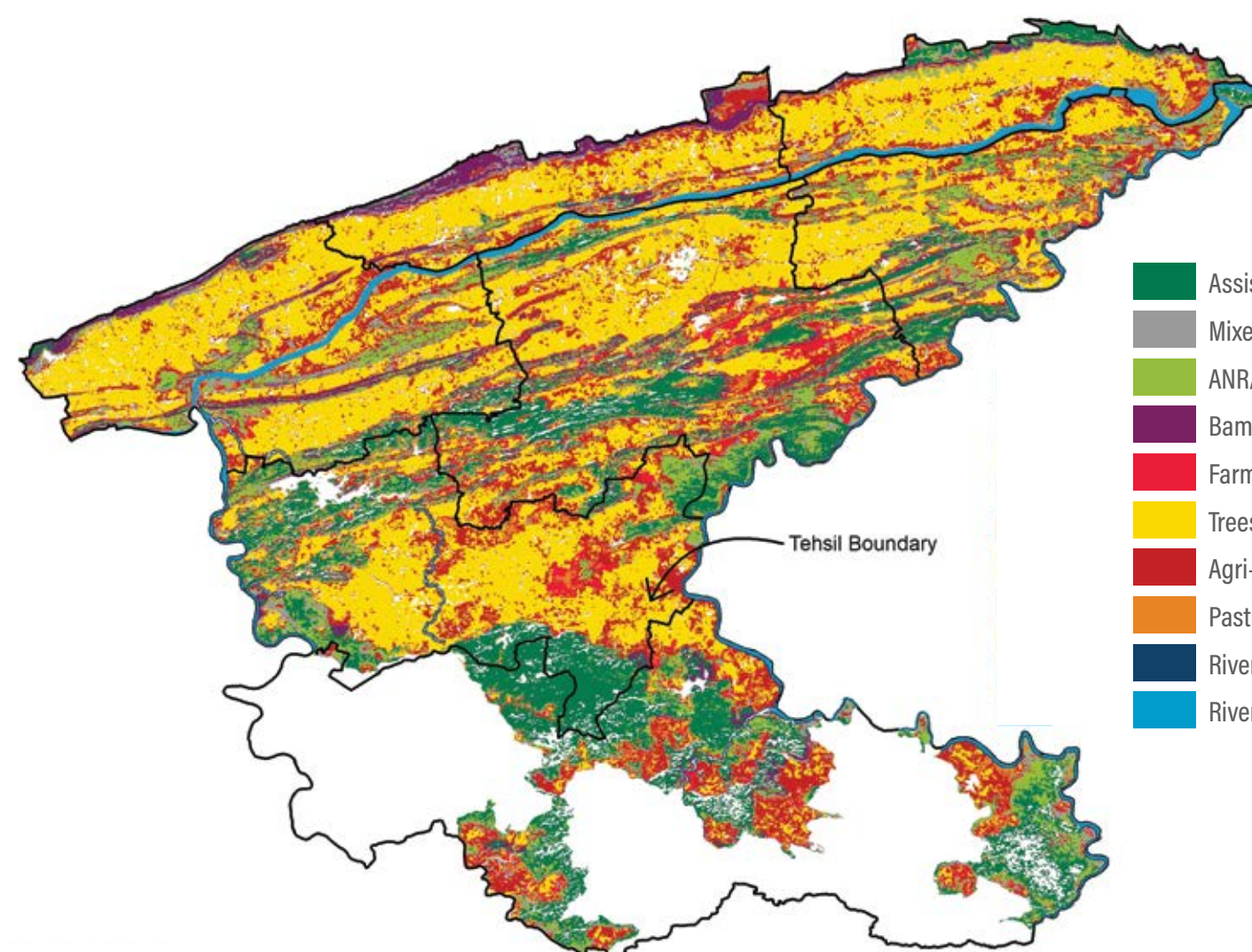


SCAN TO
KNOW MORE

Informed by the **Restoration Opportunities Atlas of India**, the Restoration Opportunities Assessment Methodology (ROAM) guided Sidhi's district-level assessment, identifying over 300,000 hectares with potential for multiple restoration interventions. The Restoration Atlas guided a landscape restoration pilot project, across 13 villages and ~9,000 hectares — integrating water, soil and moisture conservation, tree-based restoration, livelihoods and community capacity building.

This initiative has, to date, provided full-time employment to over 13,000 households, along with mobilising 500+ farmers into a producer organisation with a turnover of over INR 10 lakh.

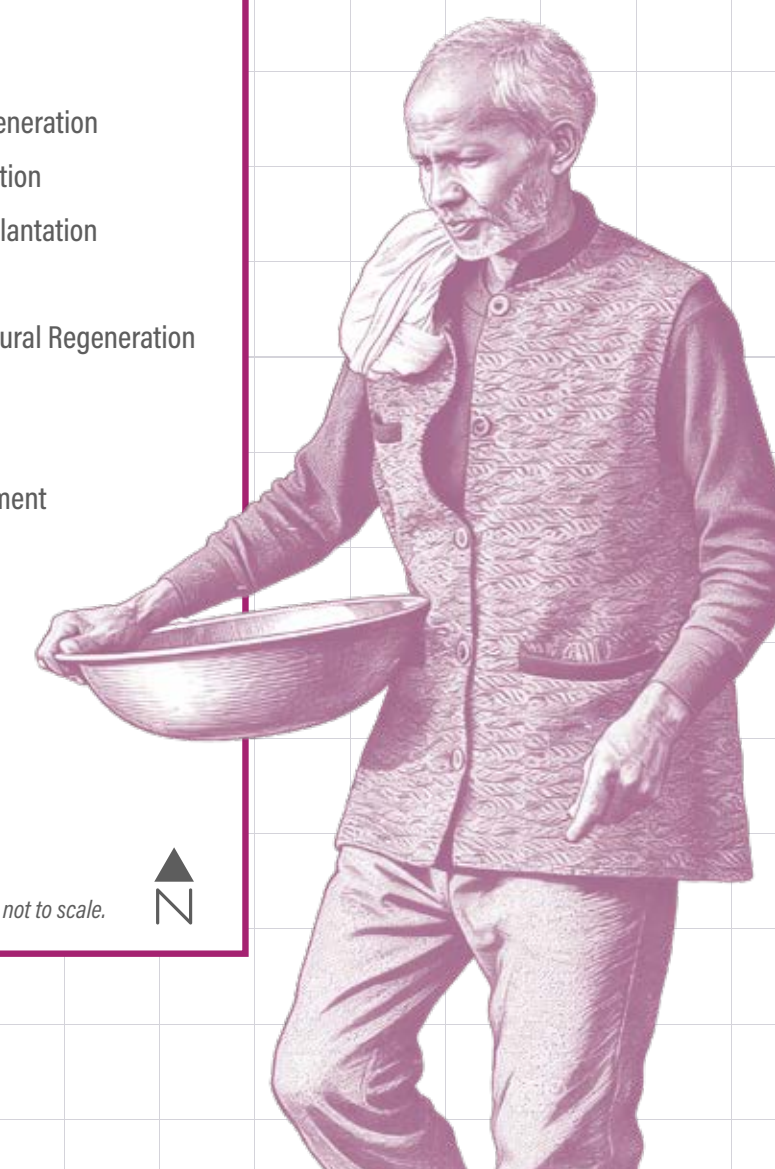
Types of Landscape Restoration Interventions in Sidhi District, Madhya Pradesh



Assisted Natural Regeneration
Mixed-species Plantation
ANR/Mixed-species Plantation
Bamboo Plantation
Farmer-managed Natural Regeneration
Trees on boundaries
Agri+Horti+Forestry
Pastureland development
Riverbank plantation
River

Source: Singh et al. (2020)

Map not to scale.





WRI India, an independent knowledge organisation (registered as the India Resources Trust) provides objective information and practical proposals to foster environmentally sound and socially equitable development.

As India's growth story unfolds amidst intensifying climate risks, the choices we make today will have significant implications for people and the environment.

We believe this inflection point can be turned into a moment of transformation and have defined three goals to anchor our work:

-  Supporting India's clean energy transition
-  Conserving nature and improving India's resilience and adaptive capacity
-  Enabling a green economy and a just transition

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