

Air Quality & Climate Intelligence for Climate-Smart Indian Cities

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Geo Smart India 2025: Planning for Extremes – Climate-Smart Cities & Infrastructure



Air Quality Crisis

You Cannot Solve What You Cannot Measure



Air Quality in Delhi-NCR

Air pollution causes **severe health loss**, reduced productivity, and major economic damage, especially in **Delhi-NCR**.



Air Pollution: A Nationwide crisis

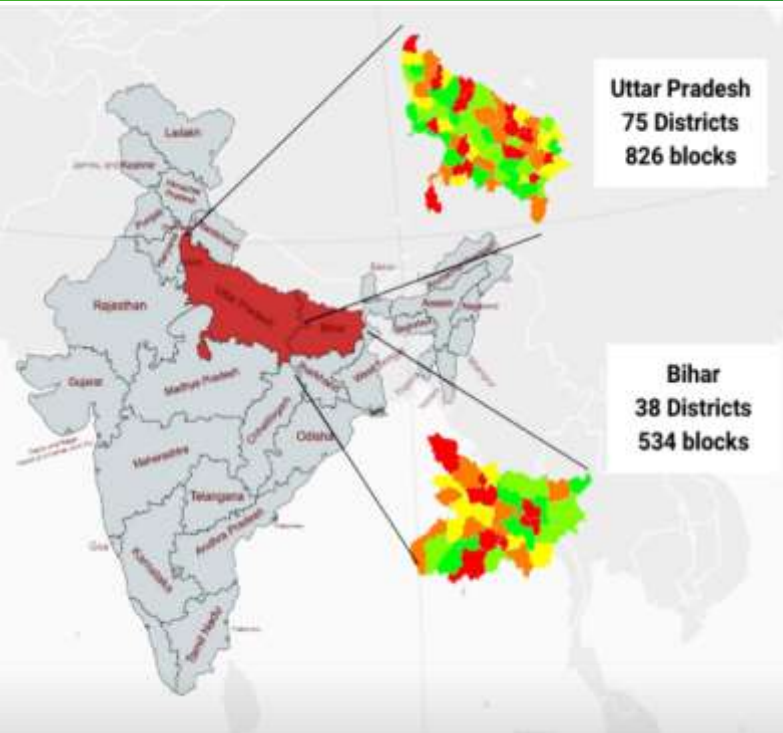
Pollution levels **are rising across the country**, affecting cities and rural areas alike, with major health and economic consequences.



Public Health Emergency

Governments need to respond at a **war footing**, and treat air pollution as a **public health emergency**.

Sources: Clean Air fund, WHO, Brihanmumbai Municipal Corporation (BMC), Delhi Pollution Control Committee (DPCC)



Challenge: Monitoring Gap

Reference-grade monitors are accurate but **sparse**;
500 out of 7000 urban settlements have any kind of govt monitoring.



Solution: LCS Network

Large-scale, indigenous LCS deployments like **Project AMRIT (1400+sensors)** bridge the urban-rural and spatial data gap.



Output: Dynamic Intelligence

Hybrid networks integrates LCS, reference stations, satellite data and AI to deliver high-resolution, calibrated air quality intelligence at 100m2 resolution..



Outcome: Actionable Insights

Supports both regional airshed management and neighborhood-level interventions, guided by dynamic hyper source apportionment and hyperlocal hotspot detection.



DIGITAL TOOLS EMPOWERING COMMUNITIES



Live AQI, Trends,
Alerts

Glance through
widgets

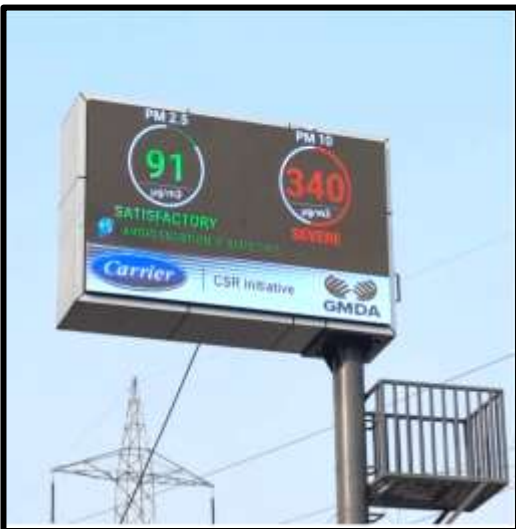


REAL-TIME DATA ACCESS FOR CITIES & CITIZENS

Airveda makes hyperlocal air-quality intelligence instantly accessible across multiple channels

Multi-Platform Data Delivery

- **App & Website:** Live AQI, trends, and forecasts
- **Instant Alerts:** High-pollution notifications & guidance
- **NASA Fire Data:** Real-time fire hotspots & regional impact
- **LED Displays (with GMDA):** Public AQI visibility across the city
- **Blinkit (10-min Delivery):** Instant access to monitors for homes & communities

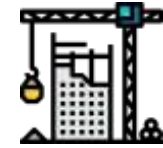




DATA-DRIVEN POLICY ENFORCEMENT

First Frontier : Clean Construction

The **Delhi Pollution Control Committee (DPCC)** and **Brihanmumbai Municipal Corporation (BMC)** have pioneered LCS deployment at construction sites. This approach allows authorities to identify and regulate non-compliant sites whilst permitting responsible construction activities to continue unimpeded.



LCS for Precision Policy Action

Low Cost sensor (LCS) enable regulators to make **evidence-based enforcement decisions** rather than implementing blanket bans that disrupt economic activity unnecessarily.





EMERGING OPPORTUNITIES FOR IMPACT

Leveraging Hyperlocal Data for Better-Governed Cities



Hyperlocal Monitoring & Emission Intelligence

- 100m-scale air quality mapping via hybrid networks (LCS, Satellite, AI)
- AI-powered real-time source apportionment updates updates inventories instantly.



Data-Driven Action & Governance

- Identify hotspots for biomass burning, construction & industrial controls.
- Performance dashboards & leaderboards for districts
- Evidence-based mitigation policy scaling & Automated GRAP based on forecasts.



Airshed & Cross-Boundary Management

- Maps pollutant flows across airsheds for coordinated regional interventions.
- Enables cities/states to tackle shared pollution sources.



Health & Exposure Insights

- Personal exposure studies (AIIMS, ICMR, etc.) Links daily air quality to health outcomes for vulnerable groups.
- Reveals district-level risks for targeted action.

AIR POLLUTION & CLIMATE CHANGE: SHARED CRISIS



SAME SECTORS DRIVING CRISIS

Transport, fossil-fuel power, industry, construction dust, biomass burning, and waste burning emit: Greenhouse gases (CO₂, methane) and Air pollutants (PM_{2.5}, NO_x, SO₂, black carbon, ozone precursors)



CLIMATE AMPLIFIED POLLUTION

Heatwaves, floods, dust storms, and forest fires now directly shape toxic episodes, from crop-fire smoke transport to dust intrusion into Indo-Gangetic Plain.



STAGNANT AIR EFFECT

Climate-driven heatwaves and weak wind circulation are trapping PM_{2.5} in the lower atmosphere, worsening exposure in Indian cities



AIR POLLUTION - FIRST FRONTIER

Significant awareness now due to the health crisis - an opportunity to accelerate Climate action on the heels of air pollution action..

NATIONAL BLUEPRINT FOR CLIMATE-SMART AIR QUALITY

ACTIONS ITEMS

- 1 Dense hybrid monitoring networks for air quality & weather:** integrate regulatory, LCS, satellite, and weather sensors across major airsheds.
- 2 City/State-level decision platforms:** provide district dashboards, alerts, forecasting, and source insights for better preparedness & faster response.
- 3 Standardised QA/QC:** national calibration farms, co-location norms, and regular performance audits to ensure data trust.
- 4 Planning integration:** embed AQ and climate intelligence into master plans, mobility plans, drainage upgrades, policy enforcements and building codes.

FUTURE-READY BUILDINGS: HEALTHY, COMFORTABLE, ENERGY-EFFICIENT



A major pollution source: Buildings drive a large share of emissions, 37–39% globally and ~25% in India through HVAC loads, diesel gensets and inefficient energy use.



High Air pollution drives demand for Indoor air quality mgmt: High air pollution has driven demand for IOT based IAQ sensors & purification to help maintain healthy environments indoors.



Green building certifications: Rising demand for healthier indoor environments is accelerating adoption of green building certifications – which in turn are driving energy-efficient buildings.



Smart buildings are micro climate-resilient units: Integrating IAQ and energy sensors turns buildings into healthier, efficient, low-carbon spaces that support broader city-level goals.



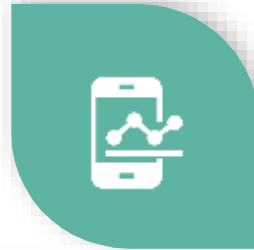
FROM AIR QUALITY INTELLIGENCE TO CLIMATE RESILIENCE

OPPORTUNITY TO BUILD UNIFIED CLEAN AIR-CLIMATE PLAYBOOK

Scaling air-quality solutions & extending them to weather nationwide can create a practical, measurable, people-first blueprint for climate action.

LEARNINGS FROM AIR POLLUTION CAN FORM THE BASIS FOR CLIMATE ACTION

Hyperlocal monitoring, hybrid networks, real-time intelligence, and targeted city action have proven effective at scale.



AIRSHED THINKING IS CLIMATE THINKING

Need to think about climate and emission sources as air sheds rather than city/state boundaries.

AIR & CLIMATE SHARE THE SAME SOURCES

The sectors driving India's pollution crisis are the same ones driving warming solutions naturally converge.



KEY SECTORS AS CLIMATE LEVERS

Targeted actions in buildings, transport, and industry cut pollution now and drive long-term climate gains.



AIRVEDA

Breath Well, Live Well

THANK YOU



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