



Clearing the Air: Strengthening the National Clean Air Programme to Reduce India's Disease Burden

Moving from Compliance to Dust-Focused
Airshed-Based Governance Health-Centred,
Air Quality

Health Burden

Air pollution contributes to 1.67 million premature deaths annually in India and is a major risk factor for asthma, COPD, stroke, heart disease, and lung cancer. It imposes a significant burden on public health and economic productivity.

NCAP Progress

The National Clean Air Programme has expanded monitoring and strengthened city-level action. However, uneven implementation, limited source apportionment, and weak inter-sectoral coordination continue to hinder progress toward cleaner air.

Policy Priority

A health-centred, airshed-based approach with stronger monitoring, clean energy, and coordinated governance is essential to reduce pollution and disease burden.

1. Background and context

Air pollution is one of the biggest environmental and health issues in India, as almost the whole population faces the problem of exposure to particulate matter concentrations (PM_{2.5}) that exceed World Health Organization's guideline level and even national standards in many cases. The key sources of pollutants are transport, industry, thermal power stations that use coal, construction work, burning of biomass and crop residues, as well as household solid fuel usage. The fast growth of urbanization, increasing numbers of vehicles, and the usage of fossil energy resources have worsened the situation. Therefore, in 2019, the Ministry of Environment, Forest and Climate Change introduced the National Clean Air Programme. It is time to assess the effectiveness of NCAP's implementation.

2. Objectives of the brief

This policy brief aims to:

- Evaluate the magnitude and geography of the public health challenge caused by air pollution in India.
- Evaluate the implementation of the National Clean Air Programme (NCAP) and its effectiveness thus far.
- Illustrate gaps and challenges in the structure, institution, and financing of NCAP that impede its success.
- Evaluate the degree to which public health concerns have been considered in air pollution policy.
- Provide suggestions for improving NCAP in phases based on evidence.

3. Data Sources and Methodology

This brief draws on:

- WHO reports and air quality guidelines
- Ministry of Environment, Forest and Climate Change (MoEFCC) and Central Pollution Control Board (CPCB) publications
- National Clean Air Programme (NCAP) documents
- Global Burden of Disease (GBD) Study and World Bank reports
- Peer-reviewed studies on air pollution and public health

Approach:

- Secondary literature and policy review
- Review of NCAP implementation and air quality governance
- Comparative analysis of policy gaps and public health impacts

4. Key Findings

4.1 Air pollution remains a leading contributor to India's disease burden

- According to the GBD study in 2019, air pollution was linked to around 1.67 million deaths in India, contributing to nearly 18% of all deaths.
- While ambient and household air pollution have been imposing heavy burdens on health and economy, according to the World Bank, the loss incurred due to air pollution in 2019 amounts to \$36.8 billion (1.36% of GDP).

4.2 Air pollution contributes to respiratory and cardiovascular diseases

- The long-term presence of PM_{2.5} is strongly linked to asthma, chronic obstructive pulmonary disease, stroke, ischaemic heart disease, and lung cancer.
- Latest studies have shown the relationship between air pollution and adverse birth outcomes, but studies on its effects on neurological and metabolic aspects are still ongoing.

4.3 Urban populations experience disproportionately high exposure

- The Indo-Gangetic Plain is home to numerous of the world's most polluted cities due to dense emissions and adverse meteorology.
- The people who suffer the greatest exposure include outdoor workers, children, older persons, and inhabitants of slums.

4.4 NCAP implementation remains uneven across cities

- The National Clean Air Programme (NCAP) has led to the establishment of air quality monitoring and city action plans in 131 non-attainment cities.
- Yet, many cities have strayed from meeting PM₁₀ reduction targets, lacking the necessary monitoring facilities and apportionment studies.

4.5 Weak governance and funding limit programme effectiveness

- The NCAP investments continue to be highly skewed in favor of controlling road dust emissions, and the transport sector, industrial fuel emissions, and domestic fuel emissions are not being given sufficient attention.
- The lack of coordination between different sectors and implementation delays for the standards on emission control have been the major bottlenecks in achieving success.

4.6 Air quality governance lacks a public health focus

- Monitoring air quality and health surveillance occur independently, which hampers evaluation of adverse health impacts of pollution.
- There is lack of public awareness, clinician training, and health-oriented early warning systems in several Indian cities.

5. Policy Gaps

Significant policy, governance, financing, and implementation gaps continue to constrain the effectiveness of India's air quality management efforts under NCAP.

5.1 Uneven Implementation and Monitoring Capacity

Implementation of NCAP remains inconsistent across cities:

- Many non-attainment cities continue to miss PM10 reduction targets.
- Air quality monitoring infrastructure remains inadequate in several urban areas.
- Incomplete source apportionment studies limit evidence-based interventions.

5.2 Limited Integration of Air Quality and Public Health Systems

Air quality management and health surveillance remain poorly integrated:

- Ambient air quality data are rarely linked with health surveillance systems.
- Limited real-time monitoring of pollution-related illnesses delays public health responses.
- Health indicators are largely absent from NCAP monitoring and evaluation.

5.3 Governance and Institutional Coordination Challenges

Air pollution control requires stronger multi-sectoral coordination:

- Coordination across the environment, transport, energy, agriculture, urban development, and health sectors remains weak.
- Urban local bodies face technical and administrative capacity constraints.
- Delays in enforcing emission standards reduce programme effectiveness.

5.4 Financing and Implementation Gaps

Current investments inadequately address major pollution sources:

- Funding remains concentrated on road dust management.
- Underinvestment in high-impact emission reduction measures.
- Slow utilization of NCAP funds.

5.5 Limited Public Engagement and Risk Communication

Community participation in air quality governance remains limited:

- Limited public awareness and community engagement.
- Inadequate early warning and health advisory systems.

6. Policy Recommendations

Strengthening the National Clean Air Programme (NCAP) requires a coordinated, health-centred approach that addresses emission reduction, institutional capacity, inter-sectoral governance, and public participation. The following phased recommendations aim to improve air quality management while reducing the health burden associated with air pollution.

A. Immediate and High-Impact Initial Actions (0-2 Years).

1. Strengthen Air Quality Monitoring and Source Assessment:

- Prioritise PM2.5 and its precursor gases alongside PM10 in NCAP monitoring and complete source apportionment studies across all remaining non-attainment cities.
- **Who:** MoEFCC, CPCB, State Pollution Control Boards (SPCBs), and research institutions.
- **Measure:** Number of cities with PM2.5 targets and completed source apportionment studies.

2. Integrate Air Quality and Public Health Surveillance:

- Establish real-time linkages between air quality monitoring systems and hospital and public health surveillance to support timely health interventions.
- **Who:** MoHFW, MoEFCC, CPCB, National Centre for Disease Control (NCDC).
- **Measure:** Number of cities with integrated air quality-health surveillance dashboards.

3. Strengthen Public Risk Communication:

- Expand air quality early warning systems and strengthen public awareness on pollution risks and preventive measures.
- **Who:** CPCB, MoEFCC, State Health Departments.
- **Measure:** Number of cities with operational air quality alerts and public outreach programmes.

B. Actions Systematically addressing Medium-Term Issues (2 - 5 Years):

1. Reduce Emissions from Major Pollution Sources

- Accelerate clean public transport, electric vehicle adoption, enforcement of industrial and thermal power plant emission standards, and access to clean household energy.
- **Who:** Ministry of Road Transport and Highways, Ministry of Power, Ministry of Petroleum and Natural Gas, MoEFCC, SPCBs, and State Governments.
- **Indicator:** Compliance with emission standards, public transport electrification, and sustained clean fuel adoption.

2. Strengthen Urban Capacity and Financing:

- Build technical and financial capacity of urban local bodies and rebalance NCAP investments towards high-impact emission reduction measures.
- **Who:** MoEFCC, Ministry of Housing and Urban Affairs, Ministry of Finance, State Governments.
- **Indicator:** Fund utilisation rates and implementation of city action plans.

C. Long-Term Structural Strategy (5+ Years)

1. Adopt Airshed-Based and Health-Centred Governance:

- Transition from city-boundary planning to an airshed-based approach and develop an integrated National Clean Air and Public Health Strategy.
- **Who:** MoEFCC, MoHFW, CPCB, NITI Aayog, State Governments.
- **Indicators:** Adoption of regional airshed action plans and a national clean air-health strategy.

2. Institutionalise Sustainable Clean Air Systems

- Establish dedicated financing mechanisms, integrate environmental health surveillance into routine health systems, and promote renewable energy and low-carbon urban development.
- **WHO:** Ministry of Finance, MoHFW, Ministry of Power, Ministry of New and Renewable Energy, MoEFCC.
- **Indicators:** Dedicated clean air financing, routine reporting of pollution-related health indicators,

7. Way Forward and Conclusion

Strengthening air quality management in India requires moving beyond compliance-driven measures towards an integrated, health-centred approach. The following priorities are essential:

- Strengthen integrated environmental and public health governance.
- Transition from city-based planning to an airshed-based management approach.
- Improve enforcement of emission standards across transport, industry, and energy sectors.
- Promote sustainable financing and strengthen institutional capacity for NCAP implementation.
- Expand public awareness, risk communication, and community participation in clean air initiatives.

A sustained, evidence-based, and multi-sectoral approach will be critical to reducing the health burden of air pollution, protecting vulnerable populations, building healthier and more resilient cities, and advancing India's Sustainable Development Goals.

8. References

- *World Health Organization (WHO) Global Air Quality Guidelines and Air Pollution Reports.*
- *Ministry of Environment, Forest and Climate Change (MoEFCC) and National Clean Air Programme (NCAP) documents.*
- *Central Pollution Control Board (CPCB) reports and air quality publications.*
- *Global Burden of Disease (GBD) Study and The Lancet Planetary Health research on air pollution and health.*
- *World Bank reports on the health and economic impacts of air pollution in India.*

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