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# On the National Clean Air Programme | Explained

**Why has the implementation of Clean Air Action Plans been inconsistent? Why are cities not using the allocated funds set aside by the Ministry of Environment, Forest, and Climate Change?**

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ANIRBAN BANERJEE



An anti-smog gun spraying water in New Delhi. | Photo Credit: SUSHIL KUMAR VERMA

**The story so far:** When the Indian government launched the National Clean Air Programme (NCAP) in 2019, it was to cut the concentration of atmospheric Particulate Matter (PM) by 20-30% by 2024, from 2017 levels. This was later revised to 40% by 2026.

## What is the NCAP?

Under NCAP, cities continuously violating annual PM levels in India need to prepare and implement annual Clean Air Action Plans (CAAPs). To facilitate this, the Ministry of Environment, Forest, and Climate Change has allocated ₹10,422.73 crore. Most cities proactively submitted their CAAPs yet their implementation has been inconsistent. On average, only 60% of the allocated funds have been used thus far, according to the Ministry, with 27% of cities spending less than 30% of their designated budgets. Visakhapatnam and Bengaluru have spent 0% and 1% of their NCAP funds, respectively. Implementation delays hinder NCAP's success, particularly delays in approvals from the competent authorities (for example, the technical specification of tendering processes or for procuring products such as mechanical sweepers and electric buses).

There is also a lack of standard operating procedures for the implementation process. Time-consuming tasks required to implement control measures and the absence of well-defined timelines create further delays. Yet other reasons include bureaucratic red-tape and lingering doubts regarding the effectiveness of proposed mitigation measures. After the recent findings over the inefficacy of outdoor smog towers, decision-makers' hesitation is justified. But overcoming this also requires a systemic approach based on Emissions Inventory (EI), Air Quality (AQ) modelling, and Source Apportionment (SA).

## How can scientific tools help?

EI and SA studies are critical to identify and understand the origins of pollution. EIs provide insights into local pollution sources and their contributions, allowing experts to forecast future emissions based on demographic shifts and technological advancements across sectors, among other factors. EIs also help shape targeted pollution control strategies. They have their limitations, too, particularly in assessing the impact of transboundary pollution sources — such as when determining the effect of stubble-burning outside Delhi on the city's air quality.

SA studies offer a detailed analysis of contributions from various pollution sources, including those located afar. However, they aren't suited for predictive analysis and require substantial resources, including specialised personnel and equipment for chemical analysis. SA studies also can't distinguish between the origins of pollution, like, say, emissions from diesel trucks 200 m away and 20 km away, because diesel emissions have similar chemical signatures.

These gaps can be bridged through AQ modelling, which informs our understanding of pollution dispersion, including from distant sources.

## How are these being used?

Ideally, the cities should look into EI and SA data to pinpoint air pollutants and prepare mitigation measures targeting each polluting activity. According to the Portal for Regulation of Air-pollution in Non-Attainment cities, only 37% of cities have completed EI and SA studies, meaning the remaining 63% don't have a clear idea about what is polluting their air. Thus, the effectiveness of CAAPs is questioned if the cities don't know the individual emissions reduction potentials of their proposed mitigation measures. Based on the potential and infrastructure requirements, cities need to set proper yearly targets and fund them.

Moreover, the NCAP's reliance on concentration data — a measure of population exposure to harmful pollution — further complicates the situation. Pollution from high-emitting industries and other sources outside city limits, carried into urban areas by winds complicates urban air-quality management. Many existing control measures focus only on primary PM emissions, neglecting their secondary precursors. A shift towards comprehensive strategies addressing both primary and secondary pollutants is thus important. Further, although one of the NCAP goals is to set up infrastructure to forecast AQ, no city barring Delhi, Pune, Mumbai, and Ahmedabad has a decision-support system.

## What does NCAP need to succeed?

Beyond the need for data and models, swift implementation on the ground is essential. For this, implementation agencies should seek to reduce bureaucratic red tape by utilising shared, standardised technical evaluations. As NCAP funding is linked with the performance of cities (based on the annual average PM concentration reduction), prior budgeting and time management play crucial roles. Technical feasibility, budgeting, and time estimates need to be part of the initial plans.

The journey towards cleaner air in India, as charted by NCAP, will be difficult but is necessary. NCAP's success hinges on a multifaceted approach that combines rigorous scientific studies, strategic funds, and swift and effective implementation of mitigation measures.