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# Expert Explains: Why quick fixes like smog towers, cloud seeding won't save us from air pollution

Quick fixes such as smog towers and cloud seeding do not deliver meaningful results. The fight for clean air is not just a technical challenge; it is a deeply political one. Here's what must be done

Written by Explained Desk

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THE BIG PICTU

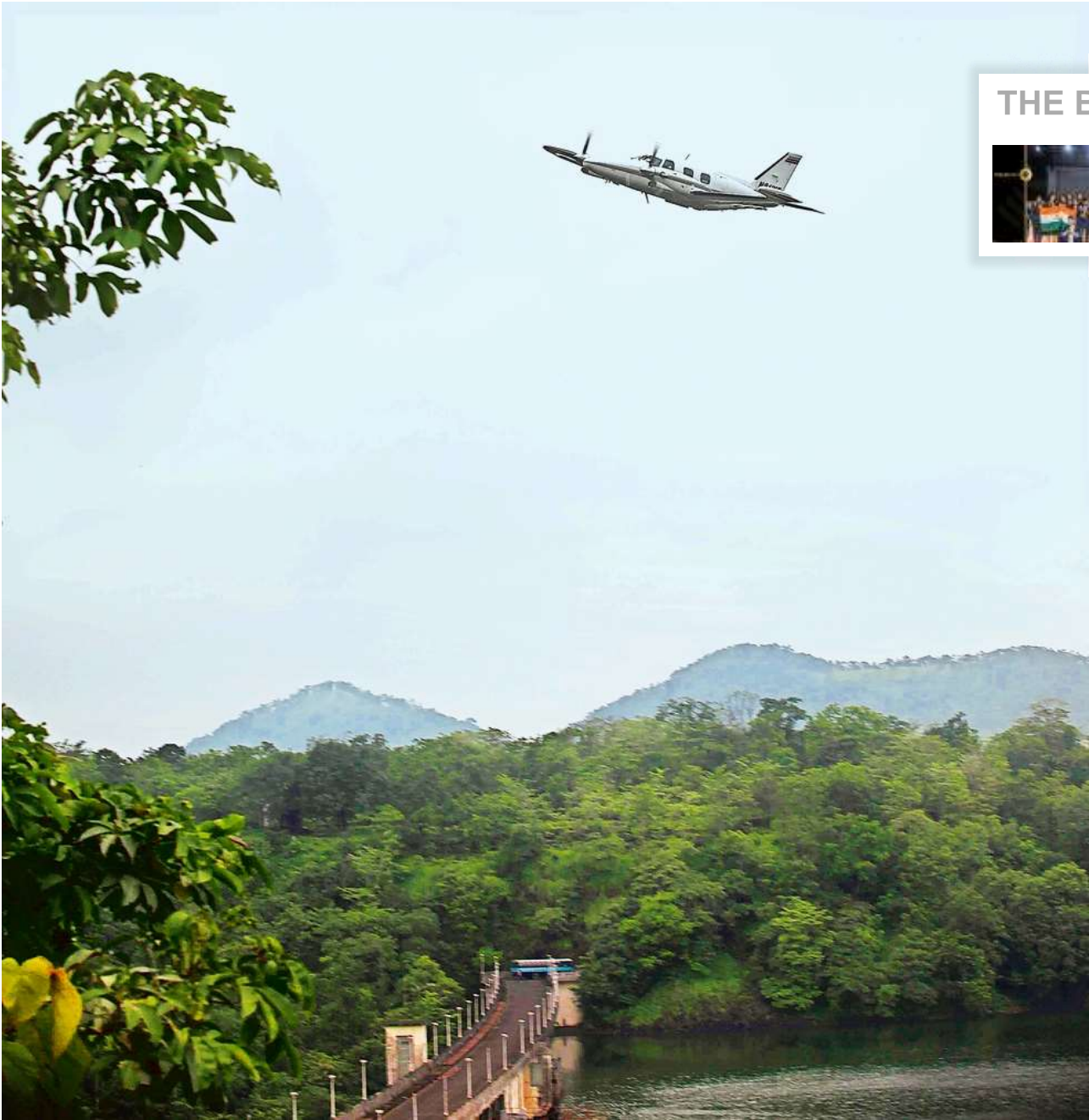
How India ca  
chessboard

Smog tower at Baba Khadak Singh Marg in New Delhi in October 2021. Express Archive

On Wednesday, air quality in Delhi slipped into the 'poor' category (AQI 200-300) for the first time since mid-June, signalling the imminent arrival of North India's bad air season.

The Delhi government announced a 21-point Winter Action Plan, including using drones to monitor pollution hotspots, deploying anti-smog guns, and exploring the possibility of creating artificial rain.

The Commission for Air Quality Management (CAQM), which issues orders to combat air pollution in NCR under the Graded Response Action Plan (GRAP), said it was watching the situation.



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Cloud seeding above Modak Sagar in Maharashtra in September 2009.

**Nature of the problem**

As the southwest monsoon season officially ends this month, India's already dangerous air pollution is set to worsen. The post-monsoon months will bring stagnant air and a weather pattern called temperature inversion — which occurs when a layer of warm air traps cooler air near the ground.

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This prevents pollutants from rising and dispersing, causing levels of fine particulate matter (PM 2.5) and other air pollutants to reach extremely hazardous levels. Although smog becomes more visible and severe in winter, poor air quality is a year-round, nationwide issue that demands sustained and comprehensive action.

A deepening economic inequality worsens this crisis. While wealthier citizens can afford air purifiers and even move to cleaner places (perhaps by the sea), poorer communities remain exposed to the full brunt of toxic air. Indeed, the question of who gets to breathe clean air — and who is left to bear the burden of pollution — is an issue of equity and justice.

India's air pollution crisis stems from multiple, overlapping sources. Year-round contributors such as biomass burning for cooking, trash-burning, vehicular emissions, and industrial activity combine with episodic events such as farm stubble burning and festival firecrackers.

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Meteorological conditions such as temperature inversion and low wind speeds during the post-monsoon and winter months result in pollutants getting trapped close to the surface, exacerbating the problem, particularly in the Indo-Gangetic plain.



The scale of the problem demands long-term solutions, but the response has often been characterised by short-term, optics-driven measures.

### Chasing shadows of ideas

Among the superficial solutions such as smog towers, water guns, and odd-even road sharing, cloud seeding has emerged as the latest “silver bullet”. This technique, which involves dispersing chemicals to induce rainfall, has garnered attention as a way to temporarily clear the air.

## THE BIG PICTURE



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But cloud seeding is more about appearing to do something spectacular than about getting to the root of the problem. It offers a fleeting reprieve at best, while diverting attention from systemic changes that are truly needed.

Besides its limited impact, cloud seeding raises serious environmental and ethical concerns. The water vapour used in the process would have naturally precipitated elsewhere, and it potentially deprives other regions of rainfall. This artificial manipulation of weather patterns could even lead to droughts in areas which would have received this rainfall otherwise.

In a country like India, where water resources are already strained, aggravating regional disparities is a dangerous gamble. Additionally, the chemicals used — such as silver iodide — pose potential long-term risks. While deemed safe in small quantities, their accumulation in soil and water could impact agriculture and ecosystems in ways that are not yet fully understood.

Smog towers, which are supposed to act as giant air purifiers that would clean the surrounding air, is another flawed solution being pursued. While these structures provide a visible symbol of action, their effectiveness is limited to the immediate vicinity, leaving the broader cityscape unaffected. Moreover, the energy required to operate these towers can contribute to emissions, potentially rendering them counterproductive.

### Concrete steps that matter

Both cloud seeding and smog towers distract from the real, science-based solutions that are needed to tackle air pollution at its source. These are some of the things

that we should be doing instead.

Coordination among various agencies: Air pollution is a complex, multi-sector problem that requires coordinated action across government bodies. Effective collaboration between agencies responsible for transport, industry, agriculture, and urban planning is crucial to ensure that policies are aligned, and efforts are not duplicated.

## THE BIG PICTURE



How India can  
address air  
pollution

For instance, addressing crop stubble-burning in rural areas requires cooperation between farmers, agricultural policymakers, and environmental regulators. No single agency or sector can tackle this problem in isolation; a unified, multi-sectoral approach, transcending city and state boundaries, is essential.

Also, recognising that air pollution is not limited to specific seasons or regions, it is imperative that solutions be designed to address this issue year-round and nationwide.

Capacity building and critical thinking: A key requirement is to build capacity and foster critical thinking among all stakeholders. This includes researchers, policymakers, regulators, industry leaders, and diverse citizen groups, who must work together to ensure that decisions are truly in the public interest.

Strengthening institutional frameworks and investing in research are necessary steps toward long-term progress. Solutions must be data-driven, informed by a clear understanding of pollution sources and health impacts, and adaptable to India's diverse regional contexts.

Air quality monitoring plays a vital role in this effort. While big cities like Delhi often receive significant attention, it is crucial to acknowledge that air pollution is a pervasive issue affecting communities across India, encompassing urban, rural, and industrial hubs.

A robust and comprehensive air quality monitoring system, integrating various technologies such as regulatory monitoring stations, advanced instrumentation, satellite-based monitoring, and low-cost sensor networks can help track pollution

trends, providing the data needed for targeted interventions to tackle both local and regional sources.

Beyond techno-centric solutions: While technological approaches may help, are insufficient. There is no silver bullet for air pollution, and many of the s quick fixes — like cloud seeding and smog towers — are designed more to demonstrate action than to deliver meaningful results. These projects often serve vested interests, offering lucrative contracts to private firms while failing to address the root causes of pollution. Wealthier citizens can afford air purifiers, creating a semblance of protection, while poorer communities remain exposed to toxic air.

Ultimately, the fight for clean air is not just a technical challenge; it is a deeply political one. Chasing quick fixes risks perpetuating these inequalities instead of addressing the structural issues at the heart of the crisis.

To confront its air pollution problem, India must move beyond the illusion of short-term solutions. What is needed is a multi-decadal, multi-sectoral effort grounded in scientific thinking and committed to sustained, collaborative action.



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