



Role of Dust Suppressants in Mitigating Air Pollution

[Source: IE](#)

Why in News?

Recently, **Dust suppressants** have gained significant attention as a potential solution to reduce **dust-related pollution** especially in cities like **Delhi** where [air pollution](#) remains a critical concern.

What are Dust Suppressants?

▪ About:

- Dust suppressants are typically composed of calcium or magnesium salts, which are mixed with water and then sprayed on roads.
- This mixture effectively suppresses dust, providing longer-lasting relief from particulate matter in the air.

▪ Efficacy:

- The [Central Pollution Control Board \(CPCB\)](#) study indicated that the application of dust suppressants, when mixed with water, is more effective at controlling pollution than traditional methods, such as water spraying.
 - The study observed up to a 30% reduction in dust concentration (including [PM10](#), [PM2.5](#), and [PM1](#)) for construction sites and roads following the use of dust suppressants.
- In 2019, the CPCB recommended the use of dust suppressants on excavated earth surfaces, construction and demolition waste piles, and access roads in construction areas.

Note: Air pollution is the presence of harmful substances in the Earth's atmosphere, originating from natural and human-made sources, which adversely affect **air quality, human health, and the overall environment.**

Air Pollutants

Sulphur Dioxide (SO₂)



It comes from the consumption of fossil fuels (oil, coal and natural gas). Reacts with water to form acid rain.

Impact: Causes respiratory problems.

Ozone (O₃)



Secondary pollutant formed from other pollutants (NO_x and VOC) under the action of the sun.

Impact: Irritation of the eye and respiratory mucous membranes, asthma attacks.

Nitrogen Dioxide (NO₂)



Emissions from road transport, industry and energy production sectors. Contributes to Ozone and PM formation.

Impact: Chronic lung disease.

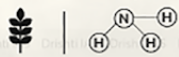
Carbon Monoxide (CO)



It is a product of the incomplete combustion of carbon-containing compounds.

Impact: Fatigue, confusion, and dizziness due to inadequate oxygen delivery to the brain.

Ammonia (NH₃)



Produced by the metabolism of amino acids and other compounds which contain nitrogen.

Impact: Immediate burning of the eyes, nose, throat and respiratory tract and can result in blindness, lung damage.

Lead (Pb)



Released as a waste product from extraction of metals such as silver, platinum, and iron from their respective ores.

Impact: Anemia, weakness, and kidney and brain damage.

Particulate Matter (PM)



PM10: Inhalable particles, with diameters that are generally 10 micrometers and smaller.

PM2.5: Fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller.

Source: Emitted from construction sites, unpaved roads, fields, fires.

Impact: Irregular heartbeat, aggravated asthma, decreased lung function.

Note: These major air pollutants are included in the Air quality index for which short-term National Ambient Air Quality Standards are prescribed.



What are the Other Recent Technological Interventions to Curb Air Pollution?

- **Ionisation Technology for Pollution Reduction:** This technology aims to **neutralize pollutants through ionization processes**, enhancing air quality in specific areas.
- **Wind Augmentation and Air Purifying Unit (WAYU):** It can be positioned in an **industrial complex, residential complexes, and schools** in the vicinity of traffic road intersection/divider to tackle air pollution.

- This device works on two principles i.e. Wind generation for dilution of air pollutants and active pollutants removal.
- **Medium/Large-Scale Smog Towers:** These towers are **substantial air purifiers** targeting the reduction of particulate matter and pollutants on a larger scale.
- **Indigenous Photonic System for Air Quality Monitoring:** The **Department of Science and Technology (DST)** is developing an indigenous photonic system for **real-time remote air quality monitoring**, improving data accuracy for informed pollution management.

What are the Government Initiatives to Combat Air Pollution?

- [National Clean Air Programme \(NCAP\)](#)
- [BS-VI vehicles](#)
- [Turbo Happy Seeder \(THS\)](#)
- [Air Quality and Weather Forecasting and Research \(SAFAR\)](#)
- [Dashboard for Monitoring Air Quality](#)
- [National Air Quality Index \(AQI\)](#)
- [Graded Response Action Plan \(Delhi\)](#)

UPSC Civil Services Examination Previous Year Question (PYQ)

Prelims

Q. In the cities of our country, which among the following atmospheric gases are normally considered in calculating the value of the Air Quality Index? (2016)

1. Carbon dioxide
2. Carbon monoxide
3. Nitrogen dioxide
4. Sulfur dioxide
5. Methane

Select the correct answer using the code given below:

- (a) 1, 2 and 3 only
(b) 2, 3 and 4 only
(c) 1, 4 and 5 only
(d) 1, 2, 3, 4 and 5

Ans: (b)

Mains

Q. Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve revised standards? **(2021)**

