Air Pollution

Mains Syllabus: GS III – Environmental pollution and degradation.

Why in the news?

In the recently held 2nd WHO conference on Air Pollution and Health, India has committed to reduce the health impacts of air pollution by 2040.

What is the status of air pollution in India?

According to the WHO, Air pollution is the contamination of the indoor or outdoor environment by any chemical, physical, or biological agent that modifies the natural characteristics of the atmosphere.

- **India's pollution** - According to the 2024 World Air Quality Report by IQAir, India ranked as the 5th most polluted country and 6 of the world's ten most polluted cities remain in India.
- According to the report, the country saw a 7 % decline in PM2.5 concentrations in 2024, averaging 50.6 micrograms per cubic metre.
- **Air pollution mortality** – Air pollution is causing 2 Million early deaths every year in India, as per CleanAirFund.
- **Delhi pollution** - For the first time in six years, the city did not witness even one day of 'good' air quality days (AQI lesser than 50) in 2024.

What are the major causes of air pollution in India?

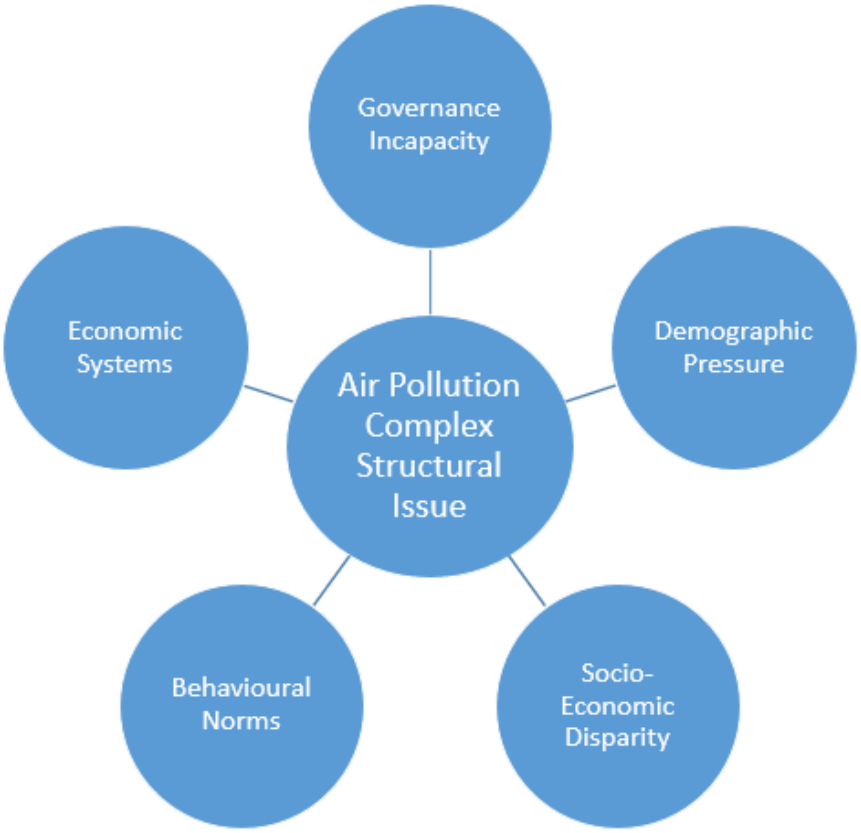
- **Vehicular Emissions** – Rising vehicle numbers increase CO, NOx, PM2.5, and PM10, worsened by old vehicles, poor fuel quality, and traffic congestion.
- **Industrial Pollution** – Factories and power plants release SO_2, NOx, and particulate matter, with coal-based industries being major polluters.
- **Agricultural Activities** – Stubble burning in Punjab & Haryana emits PM2.5 & CO, while excessive fertilizer use adds NOx to the air.
- **Household Biomass Burning** – Use of wood, cow dung, and coal for cooking emits CO, black carbon, and fine particulates, impacting air quality and climate.
- **Construction & Road Dust** – Cement dust, silica, and unpaved roads contribute significantly to urban air pollution.
- **Other reasons** – Waste burning, stubble burning and deforestation.

What are the major Government Initiatives against air pollution?

- **National Clean Air Programme (NCAP)- NCAP** target has been revised to achieve up to a 40% reduction in PM10 levels or to meet national standards (60 µg/m³) by 2025-26.
    - Focuses on monitoring, awareness, and pollution control measures at national, state, and city levels.
- **Bharat VI Emission Standards-** Introduced stricter vehicle emission norms to reduce air pollution from transportation.
- **Pradhan Mantri Ujjwala Yojana (PMUY)-** Provided free LPG connections to poor households, reducing indoor air pollution from biomass burning.
- **Faster Adoption and Manufacturing of Electric Vehicles (FAME II)-** Incentivizes the adoption of electric vehicles to reduce vehicular emissions.
- **Swachh Bharat Mission -** Focuses on waste management and reducing the open burning of solid waste, a key pollution source.
- **Coal Phase-Out in National Capital Region (NCR)-**Targeted measures to shut down coal-burning industries to control pollution in Delhi and surrounding areas.
- **Air Quality Monitoring & Digital Tools –** Investment has been made in AI-driven dashboards, smog towers, and pollution tracking systems for enhanced air quality management.

Judicial Ruling on Air Pollution
• **MC Mehta v. Union of India (1986)** – Introduced the "Polluter Pays" principle and Absolute Liability for industrial pollution. • **Vellore Citizens Welfare Forum v. Union of India (1996)** – Recognized the Precautionary Principle and Sustainable Development as key environmental doctrines. • **National Green Tribunal (2010)** - Enforced compensation for environmental damage, monitored industrial pollution, and penalized illegal waste disposal.

What are the challenges in combating air pollution?



- **Governance Incapacity** – Local governments, both rural and urban are not, adequately equipped with resources and data such as high-resolution, open-source data on emissions-generating activities to handle air pollution.
- Without such data, air pollution remains an abstract issue, disconnected from daily governance
- **Underutilization of funds** - Between 2019 and 2023, only 60% of the funds released were utilised, reflecting not a lack of intent but institutional misalignment.
- **Demographic pressure** – Increasing population of 1.4 billion and rapid urbanization (about 40% by 2030) strains air quality;
- **Socio-Economic Disparity** – Rural and informal sectors lack pollution control, while urban areas get high-tech solutions, deepening inequality.
- **Behavioral Norms** – Biomass burning and waste incineration persist, with wood, coal, and kerosene driving high PM2.5 and PM10 levels.
- **Economic Systems** – More than 50% of India's energy requirements are met through fossil fuels of coal, crude oil.

What lies ahead?

- India needs a phased, data-driven approach.
  - Phase I: Build local emissions profiles to identify the biggest pollution sources;
  - Phase II: Link funding directly to targeted actions based on that data;
  - Phase III: Track reductions in emissions, not just pollution concentrations, to measure real progress.
- Shifting to activity-based metrics — such as the number of stoves replaced or diesel buses retired — would offer a clearer picture of impact and strengthen accountability.

- To turn national goals into real progress, we need to connect them to the everyday activities that actually drive emissions.
- This shift from passive monitoring to proactive management mirrors how meaningful change happens on the ground.
- Separate funding can be created one for research and another for immediate, on-ground interventions.

References

[The Hindu| India needs to clean its air]

