Artificial Intelligence-based Pollution Sensors

Why in the news?

AI-powered air sensors offer a cost-effective, real-time, and practical way to monitor air pollution and protect public health.

Global Status of Air pollution
• Globally, air pollution causes *7 million deaths per year.* • Air pollution is the ***2nd leading global risk*** factor for death, contributing to 8.1 million deaths annually. • *Every day, 100 children* under five die in East Asia and the Pacific due to air pollution. • 99% of the population breathing air exceeds World Health Organization (WHO) guideline limits, leading to - 8.1 million premature deaths annually, and shortening average *life expectancy by 2.2 years.* • Fine particulate matter (PM2.5) and nitrogen dioxide (NO2) are key pollutants of concern. • Children are highly vulnerable due to their developing *lungs, weak immune systems, and faster breathing rates.* • The *burning of fossil fuels* is the biggest cause of air pollution and also contributes to climate change.

New AI-Driven Roaming Sensors

- Compact air sensors are *the size of a thick mobile phone* and cost a few thousand pounds.
- These sensors can be *attached to vehicles* like buses, vans, and garbage trucks to collect real-time data.
- They measure **pollutants** such as:
  - Particulate matter (soot)
  - Carbon monoxide
  - Ozone
  - Nitrogen dioxide
  - Sulphur dioxide
- These sensors ***send data every minute*** to a central system.
- **Advantages -** *Affordable and practical* alternative to expensive monitoring stations.
- Provides *real-time air quality maps* in local areas.
- Helps identify *pollution sources* and plan emergency measures.
- Can guide individuals to *safer areas* (e.g., joggers choosing cleaner routes, parents finding safer playgrounds).
- Ensures *better air quality awareness and health protection* for the public.

Right to breathe clean air is a fundamental right under Article 21.

Reference

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