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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