POLLUTION : ENVIRONMENT

NEWS : Here's why PM 2.5 pollution dipped in 2022 in India

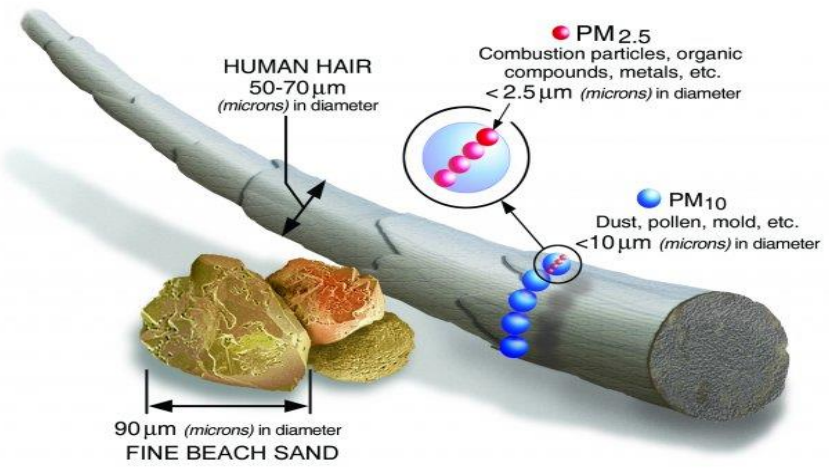
WHAT'S IN THE NEWS ?

The report by the Energy Policy Institute at the University of Chicago said meeting the World Health Organization (WHO)'s pollution guidelines would increase Delhi residents' life expectancy by 7.8 years.

Particulate Matter (PM):

PM10 vs. PM2.5:

- **PM10:** These are inhalable particles with diameters that are generally 10 micrometers and smaller. PM10 includes dust from construction sites, landfills, and agricultural



activities.
- **PM2.5:** These are finer particles with diameters 2.5 micrometers and smaller. They primarily result from the combustion of gasoline, diesel fuel, and wood, as well as industrial processes.

- **Sources of PM:** PM can be emitted directly from sources (primary particles) or formed in the atmosphere through chemical reactions of gases (secondary particles) like sulfur dioxide (SO2) and nitrogen oxides (NOx).

Impact of Meteorological Conditions on Life Expectancy:

- **Favourable Meteorological Conditions:** Between 2021 and 2022, India experienced above-normal rainfall and other favorable meteorological conditions. These conditions led to a dip in particulate matter (PM2.5) levels, which in turn contributed to an increase in the average life expectancy of Indians by one year.
- **Life Expectancy Gain:** Despite this improvement, particulate pollution still takes six years off the life expectancy of the average Indian resident.

WHO Guidelines and Life Expectancy:

- **WHO's Air Quality Guidelines:** According to the World Health Organization (WHO), if Delhi were to meet its recommended air quality guidelines, residents could see an increase in life expectancy by up to 7.8 years.

Population Exposure to Air Pollution:

- **Exceeding National Standards:** In 2022, 42.6% of India's population lived in areas where the air quality exceeded the national ambient air quality standard of 40 micrograms per cubic meter (µg/m³) for PM2.5. This indicates that nearly half of the population is exposed to harmful levels of air pollution.

Regions with Highest Pollution Decline:

- **Significant Reduction in PM2.5:** The districts of Purulia and Bankura in West Bengal, and Dhanbad in Jharkhand, saw the highest reductions in PM2.5 levels in 2022, with a decline of more than 20 µg/m³. This suggests localized improvements in air quality in these regions.

Harmful Effects of Particulate Matter:

- **Health Impacts:**
    - **Respiratory Issues:** Fine particles like PM2.5 can penetrate deep into the lungs, causing respiratory problems such as aggravated asthma, bronchitis, and reduced lung function.
    - **Cardiovascular Effects:** Exposure to PM has been linked to heart attacks, irregular heartbeats, and increased blood pressure.
    - **Lung Cancer and Reduced Life Expectancy:** Long-term exposure to PM2.5 is associated with an increased risk of lung cancer and a reduction in life expectancy due to cardiovascular and respiratory diseases.
    - **Vulnerable Groups:** Children, the elderly, and individuals with pre-existing respiratory or cardiovascular conditions are at higher risk from the effects of PM.
- **Environmental Impacts:**
    - **Visibility and Climate Change:** PM, particularly PM2.5, reduces visibility by scattering and absorbing light in the atmosphere. While some constituents of PM like black carbon contribute to climate warming, others like nitrate and sulfate have cooling effects.

Government Initiatives for Air Quality Improvement:

- **National Clean Air Programme (NCAP):** Launched to achieve a reduction in PM10 levels by up to 40% or to meet national standards (60 µg/m³) by 2025-26, based on the baseline of 2017.

- **City Action Plans (CAPs):** Implemented by 131 cities, these plans are mobilized through various Central Government schemes like the Swachh Bharat Mission (Urban), AMRUT, Smart City Mission, and the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME-II).
- **Control of Vehicular Emissions:** Introduction of BS VI compliant vehicles across the country since April 2020, along with the promotion of electric vehicles.
- **Control of Industrial Emissions:** Ban on the use of pet coke and furnace oil as fuel in NCR States since 2017, and the nationwide ban on imported pet coke since 2018.
- **Measures to Reduce Stubble Burning:** Subsidies for crop residue management machinery, establishment of custom hiring centers, and development of paddy straw-based pelletization and torrefaction plants.
- **Air Quality Monitoring:** The National Air Quality Index (AQI) was launched in 2015, with a network of 1,447 ambient air quality monitoring stations covering 516 cities across India.

Source : https://indianexpress.com/article/india/weather-contributed-marginal-dip-pm2-5-pollution-2022-9537365/
Source : https://www.indiatoday.in/health/story/air-pollution-how-bad-is-particulate-matter-for-your-health-2453501-2023-10-25