



DELHI NCR'S BATTLE AGAINST POLLUTION: A CRISIS IN THE AIR

**-Prof. S K Dhaka,
Professor, Rajdhani College
University of Delhi**

The pollution levels in the Delhi NCR region have become an annual crisis, impacting health, daily life, and the environment on an unprecedented scale. Each year, as winter approaches, Delhi's air quality plunges to hazardous levels, earning the city a notorious reputation as one of the world's most polluted capitals. A combination of factors—ranging from vehicular emissions to agricultural practices—drives this pollution, leaving residents in constant concern over the quality of the air they breathe.

Delhi's air pollution is largely attributed to particulate matter, primarily PM2.5 and PM10, which are microscopic particles that penetrate the lungs and enter the bloodstream. In recent years, these levels have consistently exceeded the safe limits set by the World Health Organization (WHO) and India's Central Pollution Control Board (CPCB). According to data, PM2.5 levels in Delhi often reach 500 micrograms per cubic meter or more during the winter months, far exceeding the WHO guideline of 15 micrograms per cubic meter for an average 24-hour period. The severity of these readings places Delhi's air quality in the

“severe” category, posing serious health risks, particularly to vulnerable populations like children, the elderly, and those with pre-existing respiratory conditions.

One major contributor to Delhi's pollution crisis is vehicular emissions. With a high population density and a significant number of vehicles on the road, transportation emissions account for a substantial portion of the air pollution. According to the System of Air Quality and Weather Forecasting and Research (SAFAR), vehicles are responsible for up to 41% of PM2.5 pollution on an annual basis. Diesel-powered vehicles, in particular, produce high levels of nitrogen oxides (NOx) and particulate matter, adding to the toxic load in the air.

Industrial activities in and around Delhi NCR also play a significant role in deteriorating air quality. The region is home to numerous factories and power plants, many of which are fueled by coal, a major source of sulfur dioxide and particulate emissions. Despite regulations, the enforcement of pollution control measures in these industries remains inconsistent, contributing

to the region's pollution woes. Emissions from these industries mix with pollutants from vehicles and other sources, creating a thick smog that blankets the city.

Another seasonal factor that exacerbates pollution in Delhi is the practice of crop stubble burning in neighboring states like Punjab, Haryana, and Uttar Pradesh. After the harvest season, farmers burn leftover crop residue to clear fields quickly and prepare them for the next sowing season. This practice, while economically convenient, releases large amounts of PM2.5 and PM10 particles, along with carbon monoxide and other harmful gases. Every year, satellite imagery shows plumes of smoke from these states drifting toward Delhi, contributing significantly to the winter smog. Despite government efforts to provide alternatives, such as subsidies for crop residue management machines, the practice continues due to limited awareness and financial incentives for small-scale farmers.

Meteorological conditions during the winter months exacerbate pollution in the Delhi NCR region. With cooler temperatures and weaker winds, pollutants become trapped close to the ground, a phenomenon known as temperature inversion. This layer of stagnant air prevents pollutants from dispersing, allowing them to accumulate and create dense, lingering smog. Consequently, the air quality deteriorates sharply during the winter season, with some days marked as "severe" or even "emergency" levels on the Air Quality Index (AQI).

The health impact of this persistent pollution is alarming. Studies have shown a direct link between poor air quality in Delhi NCR and a rise in respiratory illnesses, cardiovascular diseases, and other health problems. According to a study by the Indian Council of Medical Research (ICMR), long-term exposure to high pollution levels is associated with reduced life expectancy. The Global Burden of Disease study estimated that air pollution contributes to over one million deaths annually in India, with Delhi NCR being a major contributor. Health experts also report a rise in asthma, chronic obstructive pulmonary disease (COPD), and

even mental health issues, as residents deal with prolonged exposure to toxic air.

Efforts to address Delhi's pollution crisis have been extensive, yet the results remain inconsistent. The government has implemented the Graded Response Action Plan (GRAP), which proposes emergency measures like halting construction activities, restricting vehicular movement, and shutting down industries based on pollution levels. During peak pollution days, authorities may also close schools and advise residents to stay indoors. While these measures are necessary, they are largely reactive, focusing on short-term mitigation rather than long-term solutions.

The promotion of electric vehicles (EVs) is a promising step toward reducing vehicular emissions, with Delhi NCR rolling out policies to incentivize EV adoption. The Delhi government has introduced subsidies and set up charging infrastructure across the city to make EVs more accessible to residents. Additionally, efforts are being made to transition public transportation to cleaner fuels like compressed natural gas (CNG) and to increase the green cover within the city through afforestation drives. However, the impact of these measures will take time, given the scale of the problem.

Public awareness and community involvement are crucial in the fight against pollution. Awareness campaigns, especially those that educate people about the health impacts of pollution and the steps they can take to reduce their own footprint, can empower individuals to take action. Simple behavioral changes, such as carpooling, using public transport, and reducing waste, contribute to reducing pollution. Additionally, active citizen engagement can press for stricter enforcement of environmental regulations and encourage more sustainable practices in industries and agriculture.

Addressing Delhi NCR's pollution crisis requires government action, technological innovation, and public participation. This is essential for improving quality of life and setting an example for other cities. With collective efforts, there is hope for a cleaner future in Delhi NCR.