Delhi's Pollution Crisis - II

Click here for Part I.

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Why in news?

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The deteriorating air quality and suffocating smog have led to closure of primary schools in Delhi.

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What are the causes?

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- **Smog** - Smog refers to a smoky fog (smoke+fog) and is a kind of air pollution.
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- Fog is a hazy condition which is a result of suspension of water droplets close to the ground.
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- Smog, on the other hand, is a mixture of pollutants in the atmosphere which consists of fine particles and ground level ozone.
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- When pollution is high, nitrogen oxides and dust particles interact with sunlight to form ground-level ozone, leading to hazy smog.
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- This condition is a result of a range of factors including:
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i. geography of the place.
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ii. sunlight
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iii. calmness of winds.
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iv. post-harvest crop burning.
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v. firing of brick kilns.
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vi. dust from construction sites and unpaved roads.
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vii. vehicular pollution.
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viii. domestic and industrial emissions.
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- **Wind** - Smog occurs in a location that is far away from the actual source of pollution after the hazardous pollutants have drifted away in the wind.
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- Delhi experiences two kinds of winds in winter which are:
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i. wind carrying pollutants from stubble burning in Punjab.
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ii. wind bringing in moisture from Uttar Pradesh.
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- These two winds collide in the upper atmosphere above the region.
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- However, Delhi and its neighbouring areas have nearly still wind conditions near the ground, which is due to prevailing anti-cyclone conditions around the region during winter.
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- The two winds, combined with the near still wind conditions, effectively trap the pollutants leading to persistent smog.
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- **Crop burning** - The smog that envelops the region is exacerbated by the burning of biomass in nearby Punjab and Haryana.
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- The post-monsoon burning of rice and wheat residue releases maximum aerosols.
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- And this contributes to the volume of PM2.5 in the air.
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What should be done?

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- The Delhi government has taken various measures in the past including:
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i. the ban on Deepavali crackers.
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ii. shift to compressed natural gas for commercial vehicles.
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iii. restricting car use to odd and even number plates on alternate days.
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- However, air quality index has touched extremely hazardous levels in some parts of Delhi, turning into a public health emergency.
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- The burden of such chronic problems has outweighed the benefits conferred by the above measures.
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- Therefore, besides these minor corrections, the Centre and States must urgently address farm residue burning in north India.
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- A workable solution demands a coordinated effort from the governments of Delhi, Punjab, Haryana and Uttar Pradesh, assisted by the Centre.
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- Delhi’s unique weather conditions require a comprehensive, well informed solution to the pollution crisis.
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Quick Fact

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Particulate matter (PM)

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- PM or particle pollution is a mixture of small particles including black carbon, mineral dust, sulphate, nitrates, ammonia, sodium chloride, and liquid droplets in the air.
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- WHO classifies particulate matter into two broad types - PM10 and PM2.5, indicating the diameter of the particles in microns.
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- Chronic exposure to both PM10 and PM2.5 can lead to cardiovascular and respiratory diseases, as well as lung cancer.
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- PM2.5 can cause skin diseases and reduction in life expectancy. It can cross into the blood, causing damage in many organ systems, .
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- In Delhi, the ground-level ozone and PM 2.5 play a significant role in formation of smog.
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Source: The Hindu, Indian Express

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