

## The much-neglected pollutant

Ozone is a difficult pollutant to control because its creation in the atmosphere is complex. Photo: AFP

As a blanket of pollutants descends on large parts of north India, it is important to remember that killer pollutants go beyond particulate matter. A much-neglected pollutant in discussions about pollution is surface ozone (O<sub>3</sub>). A recent study shows that O<sub>3</sub> levels will continue to rise drastically, particularly in north India.

Matthieu Pommier from the Norwegian Meteorological Institute, Oslo, along with a team of researchers from the Chalmers University of Technology (Sweden), the Energy and Resources Institute (New Delhi), and the Indian Institute of Tropical Meteorology (Pune), analysed the prevalence of O<sub>3</sub> in the subcontinent. Their paper, "Impact of regional climate change and future emission scenarios on surface O<sub>3</sub> and PM<sub>2.5</sub> over India", was published in the journal *Atmospheric Chemistry and Physics* on January 4.

The researchers examined the rise of pollutants due to a) anthropogenic pressures and inorganic aerosols (where sulphate, nitrate and ammonium are the dominant species); and b) climate change which affects atmospheric conditions which have diluted or dispersed the pollutants.

Using statistical models relying on physical and chemical processes that either generate the pollutants or "sink" them (such as rain for PM<sub>2.5</sub> or uptake by vegetation in the case of ozone), the researchers conducted 10-year simulations for 2026-2035, 2045-2055, and used 2006-2015 as the reference.

In terms of climate change-driven variations, by the 2050s, ozone levels will increase by up to 4.4% (or by 2 parts per billion) in large swathes of north India, particularly Uttar Pradesh, while there will be a decrease over forest patches of the Western Ghats in the south of 3.4% (1.4 parts per billion). Climate change will adversely impact soil moisture, rains, or vegetation density, which will further impact the absorption of ozone.

The scenario is scarier when tabulating man-made sources such as vehicles, power plants, or any machinery that uses fossil fuels, where the O<sub>3</sub> component will increase by up to 45% in parts of north India "in the absence of a policy effort" to curb the pollutant. The increase, albeit in varying degrees, will be seen in much of the subcontinent save for a few spots close to the Western Ghats — perhaps a lesson on how to contain pollutants — where O<sub>3</sub> will actually decrease by 4%.

Surface ozone not only damages health but also destroys crops, as a previous study in 2017 by Shyam Lal from the Physical Research Laboratory in Ahmedabad, and others, showed. In a country where food insecurity is high, this should be reason enough to act.

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