THE TIMES OF INDIA

Biomass burning a major source of pollution in India

Neha.Madaan
@timesgroup.com

Pune: Vehicles, air conditioners and industries may be the usual suspects contributing to the rise in pollution levels across the country, but the practice of biomass burning is an equal threat, if not bigger.

A recent study assessing the effects of biomass burning on pollution in South Asia was conducted by Pune-based Indian Institute of Tropical Meteorology (IITM) and National Centre for Atmospheric Research in the US. The study reveals that burning of agricultural produce leftovers and forests during the major harvesting period (between March and May) contributes up to 60% release of toxic gases such as carbon monoxide and nitrogen dioxide in the eastern region, including Myanmar, 50% in central India, 25% in the Indo-Gangetic region and 40% over the Bay of Bengal.

These gases are a precursor to another harmful gas, ozone (O3), which was found to be adversely affecting the country's crops and contributing to global warming.

Open biomass burning, which refers to burning of forests, savanna/grasslands and crop residue, releases large amounts of trace gases such as nitrogen oxides (NOx), CO, methane (CH4), non-methane hydrocarbon (NMHCs), carbon dioxide (CO2) and particulate matter.

The study, which was recently published in Elsevier, an international journal, provided model-based estimates of springtime biomass burning impact in South Asia. It added that the activity significantly affects the regional ozone distribution by increasing it considerably, particularly in the eastern region, Central India and the Indo-Gangetic belt.

▶Ups ozone levels, P 4

IMPACT ON OZONE

- Fires taking place in the eastern region, including Myanmar, show a stronger impact on the surface O3 followed by the region near the foothills of Himalayas (Indo-Gangetic basin), central India and Western Ghats
- **Mean surface ozone levels during biomass burning season showed significant increase:**
  - **4 to 10 ppb (25-50%)** in the eastern region, including Myanmar (mostly during March and April)
  - **1 to 3 ppb (10 to 25%)** in the central Indian region and southern part of India (mostly during March)

'Biomass burning increases ozone levels'

Neha.Madaan
@timesgroup.com

Pune: Biomass burning is one of the most important causes of air pollution in the country with areas in central, northern and north-eastern India being the worst affected, said Chinmay Jena of the Indian Institute of Tropical Meteorology (IITM), the lead researcher of a recent study conducted to assess the effects of biomass burning on pollution in South Asia.

Jena said that about 138 to 350 teragram (Tg) of biomass (agriculture burning and wildfire) is estimated to burn here annually, which contributes around one-fourth of the total CO and NOx emissions from India.

"Agricultural burning takes place during March, April and May. The high temperature and solar radiation during these months lead to chemical changes, which result in an exceedance of ozone health and vegetation standards. There are hitherto no studies analysing the overall impact of biomass burning emissions on the chemical composition and air quality over the entire South Asian region," said Sachin Ghude, another researcher from IITM, who was part of the study.

File photo

RAGING FIRE

The analysis showed that fire pollution contributed to elevated levels of CO and NO2 across the South Asian region, with a major impact in the entire Eastern region, including Myanmar (35 to 60%), Central India (30 to 50%), Indo-Gangetic (15 to 25%) region and the Bay of Bengal (15 to 40%). The impact of fire emissions on surface CO levels is widespread. But for NO2, the impact is more restricted to the origin of the fires.

The analysis also showed a surface ozone increase because of biomass burning to the tune of 4-10 ppb or parts per billion (25% to 50%) in the eastern region (during March and April), 1-3 ppb or 10% to 25% in central India during March and 1 to 7 ppb (4-10%) in the Indo-Gangetic region. On the other hand, the ozone increase was to the tune of 2-6 ppb or 8-20% in the Bay of Bengal region in March. The highest total ozone production rates were seen over the eastern region, followed by Central India, Indo-Gangetic and the Western Ghat region.

The study revealed an increase in not only surface ozone, but also that in the troposphere. Biomass burning increased ozone up to 2 ppb or 10% in the troposphere. A total of 3.5 Tg ozone was produced due to fire emissions in the spring season from South Asia, the study said.