Ground Level Ozone Pollution in Delhi: CSE

For Prelims: CSE, CPCB, Ozone Pollution, AQI, **NCAP.**

For Mains: Ground Level Ozone Pollution in Delhi.

Why in News?

According to a new analysis by the **Centre for Science and Environment (CSE)**, parts of the Delhi-NCR region witnessed ground-level ozone exceeding the national standards on **87 out of 92 days** between March and May in 2023.

- The analysis, based on **data from the** Central Pollution Control Board (CPCB), highlights the duration and geographical spread of **Ozone Pollution**, its impact during different seasons, and the underlying causes.

Note: CSE is a **public interest research and advocacy organisation** based in New Delhi.

It researches into, lobbies for and communicates the urgency of development that is both sustainable and equitable.

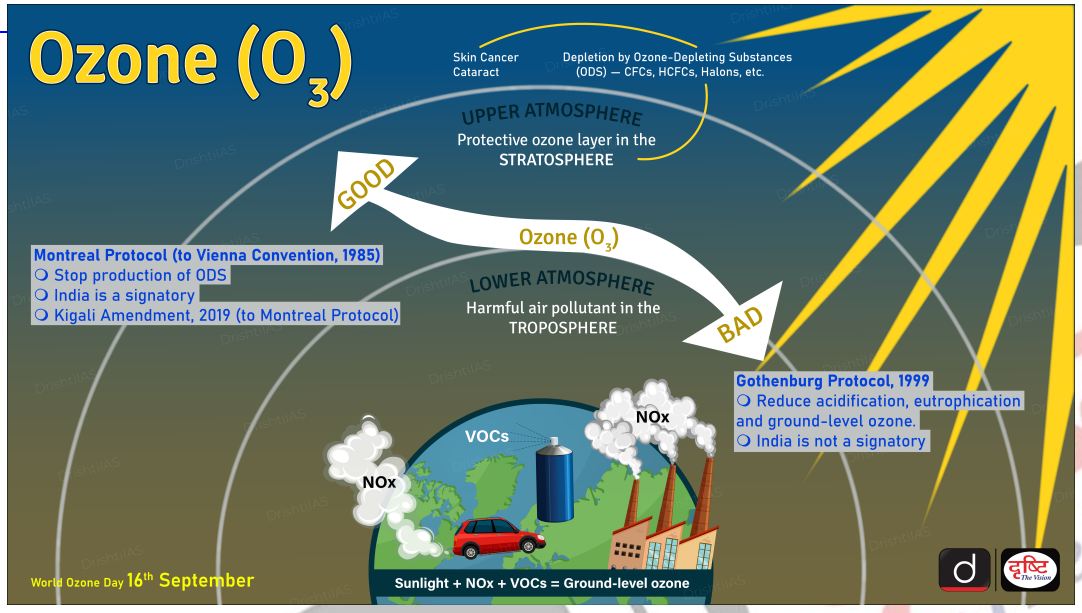
What are the Findings?

- **Duration of Exceedance:**
  - While ground-level ozone pollution in Delhi-NCR was **lower in 2023 compared to the past five years**, the duration of its **exceedance has increased.**
  - This phenomenon is of concern as **elevated ozone levels persist even hours after sunset**, contrary to expectations.
  - This summer, at the stations which reported exceedance the rolling 8-hr average stayed above standard for 4.9 hours on average, which is up from 4.6 hours observed last summer.
    - The WHO Air Quality Guidelines for ambient (outdoor) ozone **is 100 µg/m^3 (~50 ppb) measured as 8-hr maximum** moving average within a day.
- **Not Specific to Seasons:**
  - Ozone pollution is not limited to specific seasons. Even during **winter months**, **when cold and foggy conditions inhibit** ground level ozone formation, Delhi-NCR experienced **excess ozone levels** on multiple days in January 2023.
    - Ozone levels exceeded the standard **at multiple stations on 26 days** in January 2023.
- **Impact on Specific Areas:**
  - New Delhi and South Delhi areas were the **most affected by ground-level ozone pollution.**

What is Ground-Level Ozone?

- **About:**
  - Ground-level ozone, also known as Tropospheric ozone, is a **colorless and highly irritating gas** that forms near the Earth's surface, typically within two miles above the ground.
  - Ground-level ozone is not directly emitted from any specific source. It is formed through complex interactions between **Nitrogen Oxides (NOx), Volatile Organic Compounds (VOCs),** and carbon monoxide emitted from vehicles, power plants, factories, and other combustion sources. These compounds undergo cyclic reactions in the presence of sunlight to generate ground-level ozone.

//



- **Impact:**
  - When NOx and VOCs interact in the presence of sunlight, they undergo complex chemical reactions that lead to the **formation of ground-level ozone**. Ground-level ozone is a significant air pollutant and can have harmful effects on human health, vegetation, and ecosystems.
- **Initiatives:**
  - **The Commission for Air Quality Management in National Capital Region (NCR) and Adjoining Areas.**
  - **Bharat Stage (BS) VI norms.**
  - **Dashboard for Monitoring Air Quality.**
  - **National Clean Air Programme.**
  - National Air Quality Index (AQI).
  - **Air (Prevention and Control of Pollution) Act, 1981.**

UPSC Civil Services Examination Previous Year Question (PYQ)

Q. Consider the following: (2019)

1. Carbon monoxide
2. Methane
3. Ozone
4. Sulphur dioxide

Which of the above are released into atmosphere due to the burning of crop/biomass residue?

(a) 1 and 2 only
(b) 2, 3 and 4 only

(c) 1 and 4 only
(d) 1, 2, 3 and 4

Ans: (d)

Source: DTE