

CSB IAS ACADEMY

TOPIC OF THE DAY (DATE: 16.09.2023)

WORLD OZONE DAY- 16th SEPTEMBER

WHY IN NEWS?

16th September is celebrated as World Ozone Day, also known as the International Day for the Preservation of the Ozone Layer.

About World Ozone Day

- World Ozone Day is celebrated on 16th September each year to commemorate the signing of the **Montreal Protocol that came into force on 16 September, 1987.**
- In **1994**, the *United Nations General Assembly proclaimed 16 September the International Day for the Preservation of the Ozone Layer*, commemorating the date of the signing, in 1987, of the Montreal Protocol on Substances that Deplete the Ozone Layer
- The theme for World Ozone Day 2023 is “Montreal Protocol: **Fixing the Ozone Layer and Reducing Climate Change.**” This theme emphasizes the pivotal role of the Montreal Protocol in not only protecting the ozone layer but also mitigating climate change.

What is Ozone?

- It is a special form of oxygen with the chemical formula O₃. The oxygen we breathe and that is so vital to life on earth is O₂.
- Most ozone resides high up in the atmosphere, **between 10 and 40km above Earth's surface. This region is called the stratosphere** and it contains about 90% of all the ozone in the atmosphere.

Classification:

Good Ozone:

- Ozone occurs naturally in the Earth's upper atmosphere (Stratosphere) where it forms a **protective layer that shields us from the sun's harmful ultraviolet rays.**
- This “**good**” ozone is gradually being destroyed by man-made chemicals referred to as Ozone-Depleting Substances (ODS), including chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, methyl bromide, carbon tetrachloride, and methyl chloroform.

Bad Ozone:

- In the Earth's lower atmosphere (troposphere) near ground level, ozone is formed when pollutants emitted by cars, power plants, industrial boilers, refineries, chemical plants, and other sources react chemically in the presence of sunlight. Surface level ozone is a harmful air pollutant.

When was the depletion of the ozone layer discovered?

- In 1974, chemists **Mario Molina and Frank Sherwood Rowland** discovered a link between CFCs and the breakdown of ozone in the stratosphere. In 1985, geophysicist Joe Farman, along with meteorologists Brian G Gardiner and Jon Shanklin published findings of abnormally low ozone concentrations above the Antarctic, which galvanized world-wide action.



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What is Ozone Layer Depletion?

- Ozone layer depletion is the **thinning of the ozone layer present in the upper atmosphere**. This happens when the chlorine and bromine atoms in the atmosphere come in contact with ozone and destroy the ozone molecules. **One chlorine can destroy 100,000 molecules of ozone. It is destroyed more quickly than it is created.**
- Some compounds release chlorine and bromine on exposure to high ultraviolet light, which then contributes to ozone layer depletion. Such compounds are known as **Ozone Depleting Substances**.

Ozone Depleting Substances (ODS)

Ozone-depleting substances are the substances such as chlorofluorocarbons, halons, carbon tetrachloride, hydrofluorocarbons, etc. that are responsible for the depletion of the ozone layer.

Global Initiatives for Ozone Protection

MONTREAL PROTOCOL

- Over 180 countries recognized the threats posed by ozone depletion and in 1987 adopted a treaty called the Montreal Protocol to phase out the production and use of ozone-depleting substances.
- The **1987 Montreal Protocol on Substances that deplete the Ozone Layer and its succeeding amendments were subsequently negotiated to control the consumption and production of anthropogenic (ODSs) and some hydrofluorocarbons (HFCs)**.
- Montreal Protocol deals with the development of replacement of substances, firstly hydrochlorofluorocarbons (HCFCs) and then HFCs, in a number of industrial sectors.
- While HFCs have only a minor effect on stratospheric ozone, some HFCs are powerful greenhouse gases (GHGs).
- The **adoption of the 2016 Kigali Amendment to the Montreal Protocol will phase down the production and consumption of some HFCs and avoid much of the projected global warming increase and associated climate change**.
- **India, a signatory to the Protocol since 1992**, has been proactive in compliance and played a key role in achieving the historic Kigali Amendment last year for phasing down Hydrofluorocarbons (HFCs), powerful greenhouse gases contributing to global climate change.
- **Vienna Convention was ratified in 1985**, and it went into effect in 1988. It provides the framework for **international efforts to protect the ozone layer**, but it lacks legally binding, CFC use Reduction Targets.

Initiatives in India for Ozone Protection

In India, surface ozone levels are above the recommended threshold of 8 hour average of 100 µg/m³ for air quality monitoring at various stations. Exposure to high levels of surface ozone causes a number of health problems. Steps have been taken by the government to reduce ozone pollution are:

- Shifting to BS-VI compliant vehicles from BS-IV.
- Banning of garbage burning.
- Graded Response Action Plan (GRAP).
- Launch of the National Clean Air Programme (NCAP).
- Setting up of a monitoring network for assessment of the ambient air quality at 779 locations, covering 339 cities in 29 states and six Union territories.