



Ozone Layer Preservation

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This article is based on **“Is ozone layer depletion a ‘solved problem?’”** which appeared in Down to Earth on 17 September 2019. It talks about the state of the ozone layer recovery.

International Day for the Preservation of the Ozone Layer is celebrated on **September 16** to commemorate the signing of the **Montreal Protocol**, one of the most successful environmental treaties.

The Montreal Protocol has led to **the phase-out of 99% of ozone-depleting** chemicals in refrigerators, air-conditioners and many other products.

However, the ozone hole still occurs every year, like a clockwork, in the Southern Hemisphere spring (August-October).

Reason for Ozone Hole

- Ozone depletion is caused by **human-related emissions of ozone-depleting substances (ODSs)** in the stratosphere.
 - **ODSs include chlorofluorocarbons (CFCs), bromine-containing halons and methyl bromide, HCFCs, carbon tetrachloride (CCl₄), and methyl chloroform.**
- The severe depletion of the **Antarctic** ozone layer known as the **“ozone hole”** occurs because of the special atmospheric and chemical conditions that exist there and nowhere else on the globe.
 - The **very low winter temperatures** in the Antarctic stratosphere leads to the formation of **Polar Stratospheric Clouds (PSCs)**.
 - Special reactions that occur on PSCs, combined with the relative isolation of polar stratospheric air, allow chlorine and bromine reactions to produce the ozone hole in Antarctic springtime.

Global Initiatives to Curb Ozone Depletion

- The **1985 Vienna Convention for the Protection of the Ozone Layer** was an international agreement in which **United Nations** members recognized the fundamental importance of preventing damage to the stratospheric ozone layer.
- 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).
 - The Protocol was signed by 197 parties in 1987 to control the use of ozone-depleting substances, mainly chlorofluorocarbons (CFCs).
 - 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 increase and associated climate change.

Ozone Layer Depletion: A Solved Environmental Problem?

- The extent of the rate of recovery of the ozone layer has almost remained the same. A UN study '**Scientific Assessment of Ozone Depletion: 2018**', has shown that the **ozone layer is recovering only at a rate of 1-3% per decade.**
- Ozone-depleting substances also have long lifetimes that makes them persist in the atmosphere for decades to centuries.
- The skin cancer, cataracts, and other deleterious effects will continue, and the people exposed to ultraviolet radiation a long time back will still suffer the consequences even after the ozone layer is healed to a great extent.
- Though the Montreal Protocol has been had replaced CFCs with HFCs, using HFCs as an alternative will contribute to another problem i.e. global warming.

Way Forward

- The **continued adherence** is key to any environmental action to ensure that the problem doesn't return.

The recent detection of the 'rogue' production of CFC-11, **one of the most powerful ozone-depleting gases**, is a stark reminder of the need for vigilance and continued scientific investigations.
- There must be finance and technology transfer from developed countries to developing countries.
- Research and development in refrigerating technologies should be undertaken to find a replacement i.e. a non-ozone depleting substance having minimal global warming potential.

- It's high time that environmental issues like ozone depletion should **become part of public discourse**, in this light civil society can help raise public awareness.

In pursuance of SDG 13, i.e. to **take urgent action to combat climate change and its impacts**, addressing climate change and global warming needs to be clubbed with safeguarding ozone. Therefore, Ozone day cannot be about Ozone alone anymore.

Drishti Mains Question

The Montreal Protocol has led to the phase-out of 99% of ozone-depleting chemicals in refrigerators, air-conditioners and many other products. However, can it be said Ozone Layer depletion is a solved environmental problem? Discuss.