Ozone Layer is Recovering

A UN study '**Scientific Assessment of Ozone Depletion: 2018**', has shown that the **ozone layer is recovering at a rate of 1-3% per decade**.

- The **stratospheric ozone layer protects life on earth** from harmful UV radiation.
- It prevents damage to the earth's ecosystems and provides protection against **skin cancer**.
- The study shows that years of dangerous depletion caused by the release of harmful chemicals is being reversed.

World Ozone Day

- The theme for **World Ozone Day (16 September)** 2018: '**Keep Cool and Carry on: Montreal Protocol**', is a motivational rallying call urging all of us to carry on with the exemplary work of protecting the ozone layer and the climate under the Montreal Protocol.
- The theme has two connotations – that our work of protecting the ozone layer also protects climate and that the Montreal Protocol is a "cool" treaty, as exemplified by its outstanding success.

Background

- 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 **ozone-depleting substances (ODSs)** and some hydrofluorocarbons (HFCs).
- Ozone depletion is caused by **human-related emissions of ODSs** and the subsequent release of reactive halogen gases, especially chlorine and bromine, in the stratosphere.

- The Montreal Protocol's control of ODSs stimulated the development of replacement 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).
- **ODSs include chlorofluorocarbons** (CFCs), bromine containing **halons and methyl bromide**, **HCFCs**, **carbon tetrachloride (CCl_4)**, and **methyl chloroform**.
- These ODSs are long-lived (e.g., CFC-12 has a lifetime greater than 100 years) and are also powerful 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.

Findings of the Study

- It found long-term decreases in the atmospheric abundance of controlled ozone-depleting substances and the ongoing recovery of stratospheric ozone.
- It shows that the **Antarctic ozone hole is recovering** while continuing to occur every year.
- As a result of the Montreal Protocol much more severe ozone depletion in the polar regions has been avoided.
- The **Kigali Amendment** is projected to **reduce future global average warming in 2100** due to hydrofluorocarbons (HFCs) from a **baseline of 0.3–0.5°C to less than 0.1°C**.
- There has been an unexpected **increase in global total emissions of CFC-11**.
- The Antarctic ozone hole is expected to gradually close, returning to 1980 levels in the 2060s.
- At projected rates, **Northern Hemisphere** and mid-latitude ozone are scheduled **to heal completely by the 2030s** followed by the **Southern Hemisphere in the 2050s** and **polar regions by 2060**.
- The UN had already hailed the success of the Protocol which banned or phased out ozone depleting chemicals, including CFCs once used in refrigerators and spray cans, but the report said it was the first time that there were emerging indications that the Antarctic ozone hole had diminished in size and depth since 2000.

Conclusion

- For over three decades, the Montreal Protocol has done much more than shrink the ozone hole; it has shown how **environmental governance** can respond to science, and how countries can come together to address a shared vulnerability.
- The same spirit of common cause and greater leadership to implement the Paris Agreement on climate change is the need of the hour.

Kigali Amendment to Montreal Protocol

- On October 15, 2016, with the United States' leadership, 197 countries adopted an amendment to phase down HFCs under the Montreal Protocol in Kigali, Rwanda.
- The Kigali Amendment aims for the **phase-down of hydrofluorocarbons (HFCs)** by cutting their production and consumption.
- The goal is to achieve over 80% reduction in HFC consumption by 2047.
- Given their **zero impact on the depletion of the ozone layer**, **HFCs are currently used as replacements of hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs)** in air conditioning, refrigeration and foam insulation, however they are powerful greenhouse gases.
- The **Kigali Amendment** to the Montreal Protocol is **legally binding** and will come into force from January 1, 2019.
- Under the amendment :
    - developed countries will reduce HFC consumption beginning in 2019.
    - most developing countries will freeze consumption in 2024,
    - some developing countries including **India** with unique circumstances will freeze consumption in 2028.
- The plan also provides financing to certain countries, to help them transition to climate-friendly alternatives.
- With the Kigali Amendment, the Montreal Protocol has become an even more powerful instrument against global warming.