

Montreal Protocol [UPSC Environment & Ecology]

The Montreal Protocol on Substances that Deplete the Ozone Layer is an important multilateral agreement regulating the production, consumption and emissions of ozone-depleting substances (ODSs). This is an important topic in the [UPSC](#) environment and ecology segments.

Montreal Protocol - Background

By the late 1970s, scientists were able to prove that chemical substances that were used in air conditioners, refrigerators and aerosol cans were causing damage to the ozone layer. In 1985, a huge hole was discovered in the ozone layer over Antarctica. This hole allowed hazardous levels of ultraviolet (UV) radiation to reach the earth's surface.

The **Vienna Convention** for the Protection of the Ozone Layer was signed in 1985 under which UN member countries recognized the importance of curbing damage to the ozone layer. As per the Convention's provisions, countries agreed to adopt the Montreal Protocol to further the goals of the Vienna Convention.

What is the Ozone Layer?

- It is a layer in the earth's stratosphere that contains high levels of ozone.
- This layer protects the earth from the Sun's harmful UV radiation. It absorbs 97 - 99% of the UV radiation from the Sun.
- In the absence of the ozone layer, millions of people would be affected by skin diseases including cancer and weakened immune systems.
- UV radiation would also affect the environment adversely leading to decreased productivity.
- Fauna on earth is also adversely affected by the ozone layer depletion.

Ozone Layer Depletion

- This refers to the thinning of the protective ozone layer in the atmosphere.
- This happens when certain chemicals come into contact with ozone and destroy it.
- Chemical compounds that cause ozone layer depletion are called **Ozone Depleting Substances (ODSs)**.
- Examples of ODSs are chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), carbon tetrachloride, methyl chloroform, hydrobromofluorocarbons, halons, etc.
- Chlorofluorocarbons are the most abundant ODSs.
- The indiscriminate use of these chemicals causes ozone layer depletion.
- These ODSs are also powerful greenhouse gases ([GHGs](#)) and have a long life as well.
- There are a few natural causes also which cause ozone depletion such as volcanic eruptions, sunspots and stratospheric winds. However, these do not cause more than 1 - 2% of the ozone depletion.

Montreal Protocol

The Protocol was signed in 1987 and entered into force in January 1989. The protocol gives provisions to reduce the production and consumption of ODSs in order to protect the ozone layer.

- It phases down the use of ODSs in a stepwise, time-bound manner.
- It gives different timetables for developing and developed countries.
- All member parties have specific responsibilities related to the phasing out of various groups of ozone depleting substances, controlling ODS trade, reporting of data annually, controlling export and import of ODS, etc.

- Developing and developed countries have **equal but differentiated responsibilities**.
- However, both groups of nations have time-bound, binding and measurable commitments under the protocol, making it really effective.
- Under the protocol, there is a provision for it to be amended and adjusted according to the new scientific, economic and technological advancements made.
- The Protocol has undergone nine amendments or revisions.
- The governance body for the protocol is the Meeting of the Parties. Technical support is given by the Open-ended Working Group. Both meet once every year.
- The Parties are aided by the Ozone Secretariat, which is based at the headquarters of the UN Environment Programme (UNEP) at Nairobi.
- It has been ratified by 197 Parties (196 member states of the UN plus the EU) making it the first United Nations treaty to be ratified by every country in the world.
- The Montreal Protocol's provisions relate to the following:
 - Article 2: Control measures
 - Article 3: Calculation of control levels
 - Article 4: Control of trade with non-Parties
 - Article 5: Special situation of developing countries
 - Article 7: Reporting of data
 - Article 8: Non-compliance
 - Article 10: Technical assistance
 - And, other topics
- The ODSs regulated by the Protocol are listed in:
 - Annex A: CFCs, halons
 - Annex B: other fully halogenated CFCs, carbon tetrachloride, methyl chloroform
 - Annex C: HCFCs
 - Annex E: Methyl bromide
 - Annex F: HFCs
- **Multilateral Fund:** The Multilateral Fund for the Implementation of the Montreal Protocol was set up in 1991 to help developing countries to comply with the provision of the Protocol. This is under Article 10 mentioned above.
 - It provides financial and technical assistance to developing member countries whose yearly per capita consumption and production of ODSs is less than 0.3 kg.
 - The activities of the Fund are implemented by four bodies:
 - UNEP
 - UN Development Programme (UNDP)
 - UN Industrial Development Organisation (UNIDO)
 - World Bank

Success of the Montreal Protocol

- With universal ratification and a time-bound binding framework, the Montreal Protocol has been largely successful in setting out to achieving its mission of reversing the damage done to the ozone layer.
- It has been considered the most successful international environmental action taken by countries.
- The Protocol has been successful in leveling off or decreasing the atmospheric concentrations of the most important chlorofluorocarbons and related chlorinated hydrocarbons.
- Although halon concentrations have gone up, their rate of increase has come down, and their concentration is expected to decline by 2020.
- The Protocol has successfully sent clear signals to the global market.
- The full implementation of the Montreal Protocol is expected to help in the avoidance of over 280 million skin cancer incidents, almost 1.6 million deaths due to skin cancer, and millions of cases of cataracts.
- With the Protocol, the ozone layer is expected to recover by the year 2050.

- Parties to the Protocol have been able to phase out 98% of ODSs compared to levels in 1990.
- The Protocol is also helping fight climate change because most of the ODSs are also greenhouse gases.
- It is estimated that from 1990 to 2010, the protocol has helped reduce greenhouse gas emissions by the equivalent of 135 gigatons of carbon dioxide, the equivalent of 11 gigatons a year.
- The [Kigali Amendment](#), an amendment to the Protocol, has helped reduce HFC emission and decrease global temperature rise.

World Ozone Day

- September 16th is observed as the World Ozone Day. It is the day that marks the signing of the Montreal Protocol.

India and the Montreal Protocol

India became a signatory to the Montreal Protocol in 1992.

- India is an **Article 5 country** and is entitled to assistance from the Multilateral Fund in its efforts to phase out ODSs and switch over to non-ODS technologies.
- India mainly manufactured and utilised 7 of the 20 substances controlled under the Protocol. These are CFC-11, CFC113, CFC-12, Halon-1301, Halon-1211, Carbon tetrachloride, Methyl Bromide and Methyl Chloroform.
- In India, the implementation of the Montreal Protocol comes within the ambit of the Ministry of Environment, Forests and Climate Change.
- The Ministry has established an Ozone Cell for the purpose of implementing the Protocol.
- As per the National Strategy for ODS Phaseout, the Ministry has notified the Ozone Depleting Substances (Regulation and Control) Rules 2000.
 - The Rules prohibit the use of CFCs in manufacturing various products.
 - They provide for the mandatory registration of ODS producers, sellers, importers and stockists.

UPSC Questions related to Montreal Protocol

What is the Montreal Protocol and why is it important?

The Montreal Protocol is an international environmental agreement that seeks to regulate the production and consumption of ozone depleting substances or ODFs. It is important because the ozone layer needs to be protected in order to prevent the harmful ultraviolet radiation of the Sun from reaching the Earth.

Is the Montreal Protocol working?

The Montreal Protocol is a successful one because it has been able to slow down the damage caused to the ozone layer.

Has India signed Montreal Protocol?

India is a signatory to the Protocol.

