

# Global Warming

[UPSC Notes]

## What is Global Warming?

Global Warming is an unwanted phenomenon in which the temperature of the earth is rising owing to many factors. Melting of glaciers, increase in diseases like skin cancers, etc. are some of the consequences of Global Warming. This phenomenon has the potential to put an end to the human race. Thus, it becomes very important for everyone to learn about how we can contribute towards reducing it.

## Greenhouse Effect and Global Warming

Whenever we talk about Global Warming, discussing the greenhouse effect becomes primal. Without the greenhouse effect, living on this planet would not be possible for us.

- The greenhouse effect is a phenomenon that occurs naturally on earth and is responsible for the heating of the atmosphere and the Earth's surface.
- Before understanding the greenhouse effect, let us first understand what a greenhouse is.
- A greenhouse is a small house made up of glass that is used to grow plants during winter.
- In a greenhouse, the glass panels are set, which helps the light in but does not allow heat to escape. This creates a favorable environment for the plants to grow and flourish.
- Clouds and gases present in the atmosphere reflect about one-fourth of the sun's radiations while absorbing a very small part of it.
- More than fifty percent of the sun's radiation falls on the surface of the Earth. The surface of the Earth re-emits the sun's heat, but part of this sun's heat is not able to escape the temperature due to the greenhouse gases such as carbon dioxide, methane, sulfur dioxide, and so on.
- The molecules of these elements radiate heat, and a major portion of this heat reaches the earth's temperature again.
- This cycle keeps on repeating and thus causes the temperature of the earth to increase. In the past century, Earth's temperature has increased by around 0.6°C.

## Causes of Global Warming

There are many causes of Global Warming. Mainly, the causes of Global Warming can be categorized into two parts, namely, natural causes and man-made causes.

Some natural causes of Global Warming are explained below:

- **Volcanoes:** The emission of smoke and ash during volcanic eruptions spreads out in the atmosphere and adversely affects the climate. It is a well-known natural contributor which causes Global Warming.
- **Water Vapour:** This is a type of greenhouse gas. The rise in earth's temperature causes evaporation of water from the different water bodies and gets accumulated in the atmosphere, causing fatal effects on the environment.
- **Melting Permafrost:** The term permafrost can be defined as frozen soil that contains trapped environmental gases from many different years. It is situated below the earth's surface. The permafrost is present in glaciers. When the permafrost melts, it releases gases into the atmosphere leading to the increased earth's temperature.
- **Forest Fire:** The forest blaze or forest fire causes the emission of large amounts of smoke containing carbon components. The atmosphere receives these gases, which result in increased earth's temperature.

Some man-made causes of Global Warming are described below:

- **Chlorofluorocarbon:** The large-scale use of refrigerators and air conditioners release large amounts of CFCs into the environment, which damages the atmospheric ozone layer. The function of the ozone layer is to block the harmful ultraviolet rays entering the earth's surface. The CFCs lead to depletion of the ozone layer and thus increase the temperature of the earth.
- **Deforestation:** Trees and plants are the best sources of oxygen. They take in carbon dioxide and release oxygen which helps to maintain balance in the environment. Due to commercial and domestic reasons, forests are depleted excessively, thus, resulting in environmental imbalances and Global Warming.
- **Excessive Use of Motor Vehicles:** The gaseous emissions from different vehicles harm the atmosphere as these vehicles run with the help of fossil fuels which emits carbon dioxide and other toxins into the environment. This causes a rise in the earth's temperature.
- **Agriculture:** There are many agricultural activities that release gases like methane and carbon dioxide. The greenhouse gases released into the environment cause an increase in the temperature of the earth.
- **Industrial Development:** With the establishment of industries, the environment is affected to a large extent. The smoke and emission of harmful gases rising from the factories contribute to increasing the temperature of the earth.

## Global Warming Projects

**Extreme Heat Resilience Alliance:** Heat waves are known to be the major threat to Global Warming. There are 30 members in this alliance, including engineering giants Bechtel and Chennai.

This alliance was formed by Adrienne Arsht-Rockefeller Foundation Resilience Centre in 2020 with the objective of spreading awareness among policymakers and decision-makers about the effects of extreme heat on the earth's surface. It also named and ranked various heat waves.

Fit for 55: The main aim of this project is to eliminate the sources of emissions by at least 55-60 percent by 2030. This mega project was established in July by the European Commission.

Greenhouse Gas Removal Demonstrator: The excessive amount of carbon dioxide is harmful to the atmosphere. The University of Oxford also coordinated the Greenhouse Gas Removal Demonstrator project. Basically, this project will study the costs, effectiveness, and viability of trees, rock chips, charcoal, and bioenergy crops present in the country.

## Global Warming and Its Effects

The Coral reef is greatly affected by Global Warming, which further causes the loss of animal and plant lives. The rise in the temperature of the earth has pushed the fragility of coral reefs.

- Global Warming caused certain climatic changes. Various climatic imbalances, like some areas, face floods while others suffer from droughts, are the immediate result of Global Warming.
- The patterns of heat and humidity also experience fluctuations due to Global Warming. Such fluctuations cause the movement of mosquitoes with the spread of diseases. Global Warming causes a high mortality rate due to an increased number of natural calamities like earthquakes, floods, and tsunamis.
- Global Warming is hampering the lives of people in some way or the other. In such conditions as the increase in the earth's temperature, the animals migrate from their natural habitat to other places for their survival. During this process, many animals become extinct.
- The issue of Global Warming has been discussed several times by many international organizations, but only a few organizations manage to bring positive change into action.
- This is because the issue of Global Warming concerns only a small educated section of people who are aware of the effects it has on the environment. However, by spreading awareness among the people and launching small campaigns, we can make a mark towards preventing Global Warming.