

# Climate Change: Introduction, Causes, Effects & Efforts

## Introduction

- As per United Nations Framework Convention on Climate Change (UNFCCC), climate change means a change in the climate of the earth that is attributed directly or indirectly to human activity which alters the composition of our atmosphere.
- The variation and periodical shifts in weather conditions over space and time, resulting in the change in climate may also be defined as Climate Change. Ex – Change of climate from warm and moist to warm and dry.
- It is a change in the local, regional, or global environment caused due to rise in the global temperature and human activities.
- The rate of climate change relies on the pace of the causal factor.
- Climate may change gradually or rapidly, partly or drastically, short term or long term, over a Local, regional, or global scale, depending on the pace of causal factors.
- The disastrous effect of climate change may be understood by the fact that during the Jurassic Period, climate change leads to the mass extinction of Dinosaurs due to the rapid onset of the Cold Climate.

## Areas of concern

- According to a research study by the Intergovernmental Panel on Climate Change (IPCC), human activities have led to an increase in global temperature of about  $1^{\circ}\text{C}$  ( $0.8^{\circ}\text{C}$  to  $1.2^{\circ}\text{C}$ ) above pre-industrial levels.
- The global temperature may rise by  $1.5^{\circ}\text{C}$  between 2030 and 2052 if it continues to rise at the present rate.
- The atmospheric concentrations of the primary greenhouse gas ( $\text{CO}_2$ ) have increased to 410 parts per million (ppm) from about 280 ppm from pre-industrial times.
- As per an estimate of WHO, climate change may be the prime reason for the death of around 250,000 people every year due to increasing pollution-related problems.
- The poorest people will be the most affected section from climate change.

## Evidence of Climate Change

Following are the evidence that proves that climate change is a reality and needs to be taken into account for future policies and action:-

- A rise in the Global Temperature
- A decrease in the snow cover on Glaciers
- A reduction in Arctic Sea Ice Cover
- Warming of Ocean Waters
- The rising sea level of Ocean
- Increase in the event of forest fires around the world
- Ocean acidification resulting in the death of marine plants and animals
- Extreme weather events at regular intervals. Like – excessive precipitation, floods, earthquakes, tsunamis, high winds, hail, thunderstorms, downbursts, tornadoes, waterspouts, tropical cyclones etc.

### **Causes of climate change**

There are many reasons for climate change.

They can be divided into natural causes and anthropogenic causes:-

#### **Natural causes of climate change**

The important natural factors causing climate change are appended below-

- **Continental Drift** - It changes the physical features of the water bodies and landmass, which further alters the flow of ocean currents and winds.
- **Change in the variation of Earth's Orbit** - It produces 'Milankovitch cycles' which have an enormous impact on climate and have a notable correlation to glacial and interglacial periods.
- **Pollution due to Volcanic Activities** - During Volcano eruption, the outburst of gases and dust particles abrupt the incoming rays of the Sun. Also, Sulphur dioxide produced from volcanoes combines with the water to form tiny droplets of Sulphuric acid, which can stay in the environment for several years.
- **Plate Tectonics** - The shifting of the continents also affects patterns of ocean currents as it changes the geometry of the oceans.
- **Change in the pattern of Ocean Currents** – Horizontal winds result in the displacement of the water against the sea surface. If it changes, it may change the climatic condition.

#### **Anthropogenic causes of climate change**

The various manmade factors affecting climate change are appended below-

- **Excessive emission of Greenhouse Gases** – It causes pollution in the atmosphere which results in changes in the patterns of climate.



- **Change in the composition of Atmospheric Aerosols** - Aerosols cause scattering and absorbing of the solar and infrared radiation. Also, they can change the microphysical and chemical properties of clouds.
- **Deforestation** – Due to the Cutting down of trees and forests, the amount of sunlight reflected from the ground back into space is changing, which is changing the climate pattern. Also, forest acts as a carbon sink, if it decreases due to deforestation, it will disturb the balance in the atmospheric composition.
- **Excessive exploitation of natural resources** – Nature has a tremendous load on its natural resources due to growth in population and an increase in demand.
- **Policy Priority to industrialization than the environment** – In a race for industrialization, Governments around the world are formulating policies with a tilt towards more industrialization. Environmental impacts are being ignored.
- **Excessive emission of CO<sub>2</sub>** – Industrialization & increasing in use of the vehicle is increasing the emission of CO<sub>2</sub>.

### Impacts of climate change

Our planet earth is experiencing some significant changes due to variations in climatic conditions. Some significant impacts of climate change are appended below:-

- Increased risk of extreme weather events
- Increased risk of forest fires
- Increased risk of floods
- Increased risk of Droughts
- Increased risk of Diseases and illness
- Increased economic losses caused due to extreme weather events
- A rise in the sea levels
- The surge in Global Temperature
- A threat to the ecosystem and wetlands

### India's effort to counter climate change

#### National action plan on climate change (NAPCC)

Govt has launched the following programs to address climate change under NAPCC:-

- The National Solar Mission has been launched for promoting the use of solar energy for power generation
- The Government of India has initiated the **National Enhanced Energy Efficiency Mission** for Energy Conservation in Industries.



- The government of India has initiated the **National Sustainable Habitat Mission** to promote energy efficiency technology in urban planning.
- For the conservation of water through pricing and other measures, the **National Water Mission** has been launched.
- To conserve biodiversity, forest cover, and other ecological values in the Himalayan region **National Mission for Sustaining the Himalayan Ecosystem** has been launched.
- The Government of India has initiated a "**Green India Mission**" for afforestation of more than **6 mn hectares of degraded forest land** and to increase forest cover from **23% to 33%**.
- To support climate-resilient agriculture National Mission for Sustainable Agriculture has been launched.
- Through the UN Convention to Combat Desertification (UNCCD), India has prepared a 20-year national action plan for combating desertification.
- For measuring the impact of industries on the environment, the Environment Impact Assessment Program has been launched by the Government of India.
- Eco-Sensitive Zone has been notified for better protection of Wildlife sanctuaries and National Parks.
- India is promoting the use of renewable energy sources.
- India is making various policies for the conservation of the environment like - Environment (Protection) Act, 1986, Forest (Conservation) Act, 1980, Wildlife Protection Act, 1972 etc.

