

PANCHAVATI RURAL DEVELOPMENT SOCIETY

WELCOMES YOU TODAY'S NATIONAL ENVIRONMENT AWARENESS CAMPAIGN ON "CLIMATE CHANGE"

WHAT IS CLIMATE ? WHAT IS THE DIFFERENCE BETWEEN WEATHER AND CLIMATE ?

Climate is What YOU EXPECT : Weather is What YOU GET.

Weather : Weather is an assessment of Temperature, Humidity, Cloud Cover, Pressure, Wind conditions etc.. It describes what is happening outdoors in a GIVEN PLACE AT A GIVEN TIME. The Weather can change a lot within a very short time.

Example : It may rain for 1 Hour and then become Sunny and Clear.

The climate of a place is the "average weather" that it experiences over a period of time. The factors responsible for the change in the climatic conditions are the rainfall, sunshine, wind, humidity and temperature. Any change in the climate takes a long time to settle in.

Changes occurs in the system when any type of imbalance occurs with the controllers of the atmosphere (Green house gases: CO₂ , O₃, water vapors, and Nitrous Oxide). These gases protect us from the harmful violate radiations.

Increase in human activities leads to the changes in the green house emissions, results in ton global warming and ultimately causes the change in the climate.

CAUSES OF THE CLIMATE CHANGE:

The reasons behind the climate change are natural and man made.

NATURAL CAUSES:

There are present various types of the natural factors which are responsible for the climate change.

(a) Continental Drifts:

Continents are drifting apart at the rate of 1 mm every year, which is ultimately causing the changes in the climate system.

(b) Volcanoes:

Eruption of a volcano results in the release of a large amount of sulphur-dioxide, water vapors, dust and ash into the atmosphere. Gases and dust particles block the incoming rays of the sun, leading to the cooling effect. Sulphur-dioxide combines with the water and form the sulphuric acid.

These particles stay in atmosphere for long time, and start behaving like reflectors of the sunlight.

(c) Ocean Currents:

Oceans are the major components of the climate system. They cover around 71% of the Earth. Ocean currents help to move a vast amount of heat across the planet. Winds push horizontally against the sea surface and drive ocean current pattern. The El Nino event in the Pacific Ocean is affecting the climatic conditions all over the world.

El Nino is a shift in ocean temperatures and atmospheric conditions in the tropical Pacific that disturbs the weather around the world.

El Nino means the "the boy" in Spanish. It was named after the Christ child since its effects are first felt around Christmas. It leads to the terrible extremes of weather. The warm phase of the El Nino lasts for 8 – 10 months.

The impacts of the El Nino are:

- The famine in the Indonesia
- Bush fires in Australia during droughts
- Droughts in California.
- Destruction of fishery off the coast of Peru.
- Devastating floods in America.
- Storm hits in China.
- Drought in Austria.
- Forest fires in South-East Asia and Brazil.

La Nina is the reverse of the El Nino event it is the cold event, it is the cooling of water in the Pacific Ocean.

The impacts of the La Nina are :

- Abnormal change in the cooling and heating of the temperature.
- Snow and Rain in west coast.
- Cold weather in Alaska.
- Create increase in the number of hurricanes in the Atlantic.

Man made Causes:

Rapid industrialization lead to the exploitation of the natural resources for the construction, industries, transport and consumption. These activities lead to the exploitation of the forest cover, fossil fuels etc. which ultimately lead to the rise in the level of green house gases in the atmosphere.

(a) Green House Gases:

Carbon dioxide is the most important green house gas in the atmosphere. Changes in land use pattern, deforestation, land cleaning, agriculture and other activities have all led to an increase in the emission of carbon dioxide.

Methane is another important green house gas which comes from the animal dung, released from the rice or paddy fields if they are flooded during the mature periods. It is also emitted from the landfills and other waste dumps, incineration activities, oil drilling, coal mining etc. Nitrous oxide from the fertilizers.

Ozone acts as the green house gas in the atmosphere, which safeguards the planet from the harmful radiation from the sun. Ozone is formed in the troposphere from the reactions of CO, and oxides of N and non-methane hydrocarbons and from chemical feed backs involving methane. Ozone has the dense cover over the equators and decreases over the poles.

Ozone depletion:

It was first observed in the 1970s. The depletion of the ozone layer was clearly seen in the South Pole i.e. Antarctica, where there is a large hole. The depletion of ozone is due to the increasing presence of the CFC's (Chloroform Carbons).

The process of depletion:

- When CFC's and other ODS's (Ozone Depleting Substance) releases in the atmosphere.
- Winds efficiently mix it with the troposphere and evenly distribute the gases, but ODS's do not dissolve into the atmosphere.
- Strong UV radiations break apart the ODS molecules. CFC release the chlorine.
- These free atoms destroy the Ozone molecule one atom of the chlorine can destroy over 100,000 ozone molecules.
- This decrease in the level of the ozone concentration leads to the penetration of more UV radiations, which ultimately causes the ill effects to the human beings.

Depletion in Ozone layer causes the following healthy impacts:

- Skin cancers: non-melanoderma and melanoderma.
- Effects on eyes: cataracts
- Photokeratitis (snow blindness)
- Effect on immune system.
- Effect on respiratory system.
- Effect on food production.

There are few activities, which are responsible for the change in climate:

- Over consumption of the fossil fuels for the electricity generation, extraction of coal and petrol, paper making etc.
- Plastic used in day-to-day life.
- Over population.

Impacts of Climate Change:

(i) Agriculture

- The change in climate will ultimately lead to the alteration in the temperature and rainfall and indirectly through changes in the soil quality, pests and disease.
- The rise in temperature is the favorable condition for the pests to complete their reproductive cycles that will put negative effects over the agricultural activities.
- At higher altitudes the rise in temperature is favorable for the agriculture.
- Extreme weather conditions such as high temperature, heavy rainfall, floods, droughts, etc., will also affect crop production.

(ii) Weather

- The change in the weather changes the rainfall and snowfall activities.
- Increase in the droughts and floods.
- Melting of glaciers and polar ice sheets.
- Results in the accelerated sea-rise level.
- Increase in the level of evaporation of surface water, will increase the moisture holding capacity of the air.
- Increase in the cyclones and hurricanes.

(iii) Sea Level Rise

The heating of the oceans and melting of the glaciers and polar ice sheets results due to the global warming which are increasing the level of sea.

Sea level rise leads to the :

- Loss of land due to inundation and erosion.
- Increase in flooding.
- Salt – water intrusion.
- Adverse effects over the coastal agriculture, tourism, fresh water resources, fisheries and aquaculture, human settlements and health.
- There will be increase in the level of the water due to the melting of the glaciers.

(iv) Forest and Wild Life:

Ecosystems are the storehouse of the species and genetic diversity. Plants and animals are very sensitive to the changes in the climate.

- Climatic change adversely affects the ecosystems at the high latitudes, the tundra forests, polar Regions.
- Animals living in the Alpine region are very much susceptible to the change in climate.
- Migratory birds from the cold regions of the world are affected badly due to changes in the climate, these affect the flight pattern and feeding points during the flight.

(V) Marine Life:

- Changes in the climate lead to the damage to the coral reefs in the Ocean water, changes in the temperature causes the bleaching of the corals.
- Zooplanktons, fishes and sea birds are facing the reduction in number.

(vi) Impacts on Human Beings:

- Extreme weather events cause the respiratory and cardiovascular disorders.
- Ecological imbalance, changes in food production levels, increase in distribution level of malaria and other vector born diseases.
- Changes in climate especially in temperature, humidity and precipitation influences the lives of living organisms and leads to spread of the infectious diseases.

- Rise in water level results into floods which ultimately leads to the deaths.
- Rise I level of photo chemical oxidants.
- Decrease in level of Ozone layer results in to exposure of the UV radiations of sun which leads to the problem of the cancer.

Solutions :

All the countries have to take the preventive steps to stop the changes occurring in the Climatic system. Bring down the activities of deforestation, fossil fuels, cut down the consumerism and use of the more environment – friendly agricultural methods. Cut down the use of the coal and sources of the clear energy. Biotechnology can be used to reduce the water requirements of the crops, increase crop yield, and reduce the use of chemical fertilizers and pesticides.

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