



CLIMATE CHANGE

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- Weather reflects short term conditions of the atmosphere, it can change from minute-to-minute, hour-to-hour, day-to-day and season-to-season. Climate is the average of weather over time and space.
- Unlike “weather,” which means temperature, rainfall, humidity of a particular time at a local area, “climate” has spatial and temporal components.
- It consists of many kinds of weather events, their periodicities, intensities, and nature of dynamism.
- When we talk about climate change, we actually understand more than the literal changes of weather events over the time and space of that climate.



- changes in ocean current, melting of ice, and loss of biodiversity are included in climate change; they are not discussed as conventional events of weather.
- By climate change, we understand detrimental effects in environment – emission of pollutants, temperature rise, precipitation change, sea level rise, flooding, intensified cyclones, abrupt frequency of events, ozone layer depletion, biodiversity loss, vegetation change, and drought – almost all negative impacts.
- Climate change is a term that refers to major changes in temperature, rainfall, snow, or wind patterns lasting for decades or longer.



- According to Working Group II of the Intergovernmental Panel on Climate Change (IPCC); Climate change refers to any change in the climate over time, whether due to natural variability or as a result of human activity.



IMPORTANT GREENHOUSE GASES:

Major gases-

- Carbon dioxide
- Nitrous oxide
- Chlorofluorocarbons
- Water vapour

Other gases-

- Carbon monoxide
- Carbon tetrachloride
- Hydrochlorofluorocarbons
- hydrofluorocarbons
- Perfluorocarbons, etc.



Causes of climate change

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graph TD; A[Causes of climate change] --> B[Short-term climate change]; A --> C[Long-term climate change]; B --> B1[1. Variation in solar irradiation]; B --> B2[2. Variation in atmospheric dust]; B --> B3[3. Human Induced changes in earth's surface]; C --> C1[1. Sun-Earth relations (Milankovitch Theory)]; C --> C2[2. Variation in oceans.]; C --> C3[3. Extraterrestrial impacts causing climate change. eg- reduction in O2, addition of CO2.];
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Short-term climate change

1. Variation in solar irradiation
2. Variation in atmospheric dust
3. Human Induced changes in earth's surface

Long-term climate change

1. Sun-Earth relations (Milankovitch Theory)- earth-sun relations keeps changing not constant rather periodically. Eg. Orbit changes into more elliptical every 100,000 years.
2. Variation in oceans.
3. Extraterrestrial impacts causing climate change. eg- reduction in O₂ addition of CO₂.

EFFECTS OF CLIMATE CHANGE:


- **Rise in average temperature of the globe-** the average rise in temperature of earth was about 1°C in past 200 years. In pre-industrialization phase average temperature of earth was 13.96°C . In 1992 it was 14.96°C and if this rate continues then till 2050 rise in average temperature of earth would be from 1.5°C to 5.5°C .
- **The earth's rising temperatures are fueling extreme weather** such as longer and hotter heat waves, more frequent droughts, heavier rainfall, and more powerful hurricanes.



.....EFFECTS OF CLIMATE CHANGE:

- Melting of ice
- Sea-level change
- Frequent and stronger storms
- Ocean acidification
- Damage to marine ecosystem-
 - Damage to coral reefs
 - Loss of planktons



- **Effects on human health-** malaria, respiratory diseases, air borne diseases, diarrhoea, skin cancer, lung diseases, etc.
 - According to IPCC, global warming has serious economic consequences too.
 - Disturbed hydrological cycle
 - **Effect on Plants and Animals-** ecological imbalance, movement towards colder regions, change in feeding and nesting patterns of animals, change in budding and flowering season of plants ,etc.
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EVIDENCES OF CLIMATE CHANGE

- Rising temperature of the globe- ten hottest year ever recorded all took place since 1998, with every passing year a rise in global temperature is evident.
- Rapid melting of glaciers- in Himalayan region, Africa, Alps, Andes, Alaska, Andes and Rockies.
- Polar ice caps are melting- According to recent studies Arctic will become snowless by 2022.
- Breaking of Antarctic ice-sheets –rapid breakage or collapse of large ice-sheets of Antarctica is an evidence that climate is changing .
- Rising sea-levels –last decade saw increase in sea level by 7-8 inches and it is continued till today.



.....EVIDENCES OF CLIMATE CHANGE

- Temperature of ocean water is rising- due to more CO_2 , ocean is absorbing more sun's heat leading to rise in temperature. This also causes ocean acidification.
- Thawing of permafrost in Northern Hemisphere is great evidence of climate change.
- Appearance of grasses in Antarctica.
- There is evident shifting in weather phenomenon.
- There is change in precipitation pattern all around the globe.



WAYS TO PREVENT GLOBAL WARMING AND CLIMATE CHANGE:

- Use 4R's-

Refuse, Reduce, Reuse & Recycle

- Use of public transport
- Replacing regular bulbs with eco-friendly bulbs like Compact fluorescent bulbs (CFL bulbs).
- Less use of AC, Refrigerator, Gysers, and other electric appliances.
- Spreading awareness about global warming causes and its consequences to people.



- National action plan on climate change (NAPCC)
Estd _30 June 2008
8 Mission under NAPCC
- 1. National Solar mission
2.national mission on enhanced energy efficiency
3.National mission on sustainable habitants
4.National water mission
5.National mission for sustaining the Himalayas ecosystem
6. National mission for a green India
- 7.National mission for sustainable agriculture
8.National mission on strategic knowledge for climate change .

