

Mains 100



Most Important 100 Topics

UPSC 2022

Lecture 01

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What is Climate Change?

GREENHOUSE EFFECT

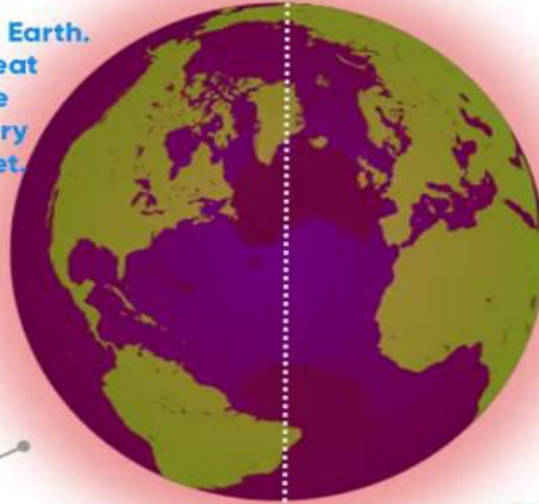
It is the natural warming process of the Earth. Greenhouse gases (GHGs) retain the heat of the Sun presented in the atmosphere and maintain the temperature necessary for the development of life on the planet.

1

The solar energy passes through the atmosphere. Some of it is absorbed by the surface of the planet and another is reflected.

2

A part of the reflected radiation is retained by the GHGs. The rest go back into space.



GLOBAL WARMING

Caused by human activities. It's the long-term increase in the temperature average of the planet due to the emission to the atmosphere of GHGs to a large extent.

1

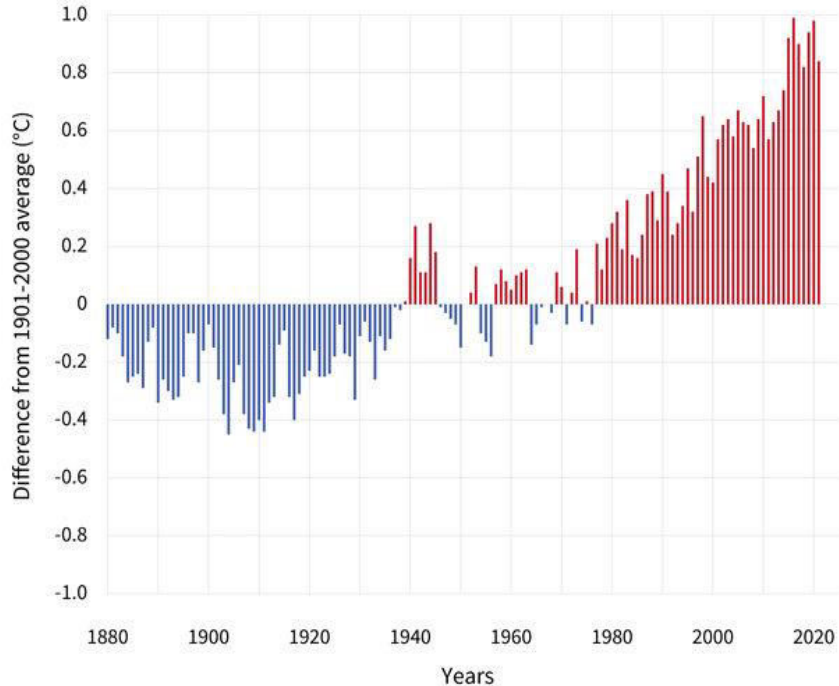
The burning of fossil fuels, deforestation, intensive agriculture and livestock farming ...are the cause of the increase of greenhouse gases in the atmosphere.

2

With a high level of GHGs in the atmosphere, it retains more heat. This damages the natural balance and increases average temperature of the Earth.

What is Climate Change?

GLOBAL AVERAGE SURFACE TEMPERATURE



Global Warming vs. Climate Change

The **gradual** increase of Earth's surface temperature.

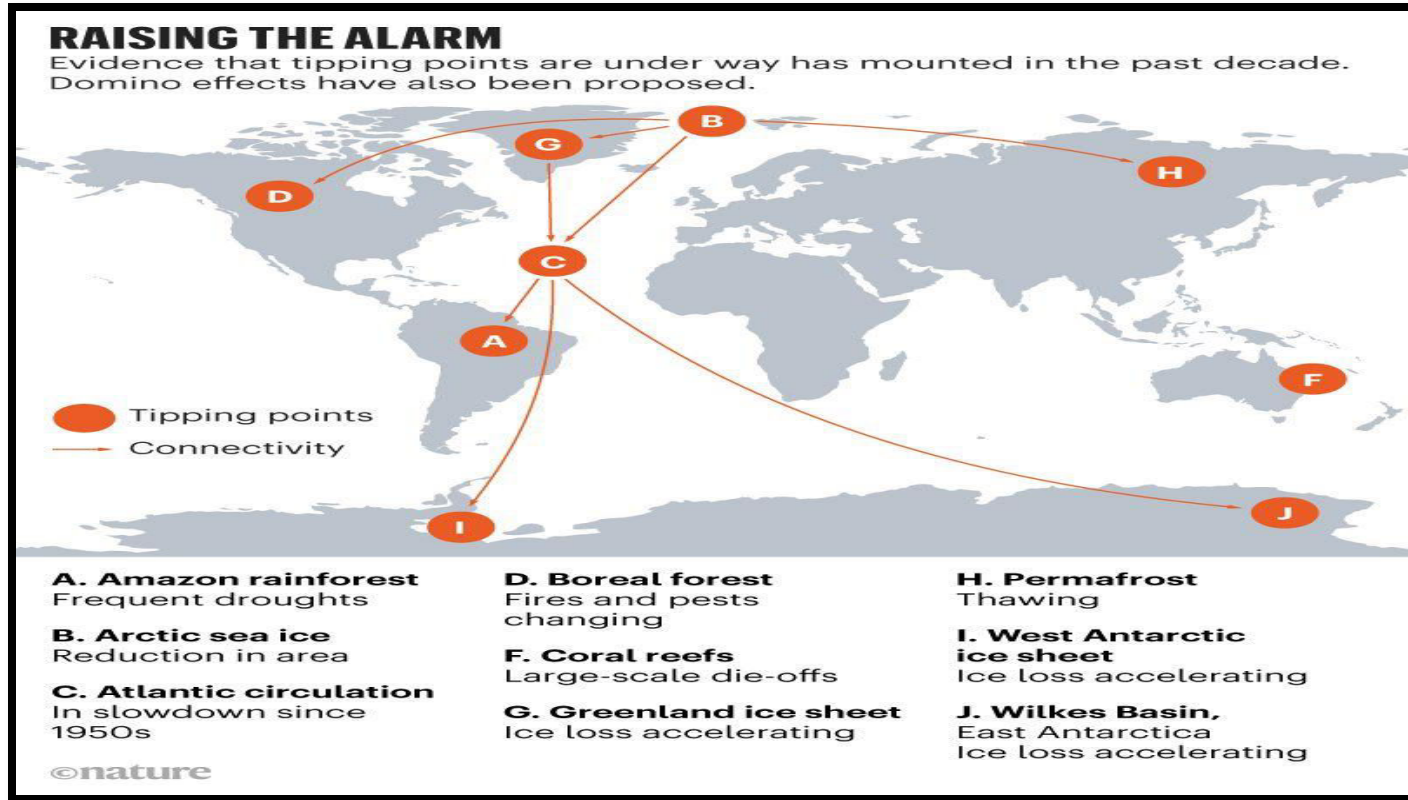
The **long-term** change in global weather patterns.



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Climate Change - Tipping Points



Climate Change

- Impact on Oceans

- Oceanic **Heatwaves** causing sea surface temperature to rise - Loss of marine biodiversity
- Ocean **level rising** due to glacier melting
- Changes in chemistry of ocean water
 - Ocean **acidification**
- Coastal flooding changing due to sea level rise

Climate Change

- Impact on Cryosphere
 - Ice mass loss from mountain glaciers
 - Ice mass loss from Arctic, Greenland & Antarctic
 - Loss of Permafrost creating vicious CC cycle
 - New land and accelerating methane emissions
 - New pathogens released
 - Coastal Fishing impacted adversely

Climate Change

- Impact on Forests

- More Frequency and intensity of forest disturbances
 - Wildfires
 - Storms & Disasters
 - Insect outbreaks
 - Invasive alien species
- Loss of forests leading to vicious CC cycle



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Climate Change

- Impact on Coastal Regions
 - Sinking coastal regions
 - Salination of fresh water sources
 - Frequent & intense cyclones
 - Heavy population & high vulnerability
 - Climate migration
 - Loss of livelihood (Mainly Fishermen)
 - Coastal environmental degradation

Climate Change

- Impact on Biodiversity

- Changes in distribution - Poleward Movement of species
- Increased extinction rates
- Changes in reproduction timings
- Changes in length of growing seasons for plants

Climate Change

- Impact on Agriculture

- Increased exposure to **heat stress**
 - **More Floods/More Droughts**
- Changes in **rainfall patterns**
- **Greater leaching** of **nutrients** from the soil during intense rains
- **Greater erosion** due to stronger winds
- More **wildfires** in drier regions

Climate Change

- **Impact on Humans**

- Health
- Food Security
- Water Security
- Economic Impact
- Displacement/Migration
- Conflict/Race for resources

Climate Change

- Impact on Vulnerable Sections

Women

- Climate change **deepens existing inequalities**
- Higher **workloads** for women
- **Occupational hazards** indoors and outdoors
- **Psychological** and **emotional stress**
- Higher **mortality** compared to men
- **Displacement/Migration**
 - UN estimates that 80% of people who are **displaced** due to CC are women.
 - Increased **violence** due to displacement & CC migration
 - Threat of **human trafficking**

Climate Change

- Impact on Vulnerable Sections

Children

- Global warming leads to more **diseases** to which children are most susceptible
- CC based food insecurity & lack of **nutrition**
- CC based migration affects child **education**
- CC based disasters lead to large **children deaths**
- **Physiological** & **emotional stress** due to CC based migration
- Threat of **human trafficking**

Status of Fight against CC

- **UNFCCC**

- **IPCC**

- **Kyoto Protocol**

- **Paris agreement**

- **INDCs** - Intended Nationally determined Contributions
- Are **INDCs** enough?
- Are **INDCs** being implemented properly?
- Is **CBDR** principle being followed?
- **GHG & Urbanisation** problem?

- **SDG 13**

- Take urgent action to combat climate change and its impacts

- CC Mitigation
- CC Adaptation

- Reducing Emissions from Deforestation and Forest Degradation (**REDD & REDD+**)

India & Climate Change

- **NAPCC**

1. National Solar Mission
2. National Mission for Enhanced Energy Efficiency
3. National Mission on Sustainable Habitat
4. National Water Mission
5. National Mission for Sustaining the Himalayan Eco-system
6. National Mission for a Green India
7. National Mission for Sustainable Agriculture
8. National Mission on Strategic Knowledge for Climate Change

- **Other Steps**

- National Clean Energy Fund
- Bharat Stage (BS) Emission Norms
- International **Solar Alliance**
- Coalition for **Disaster Resilient Infrastructure**
- Paris Agreement - INDC
- **India would achieve net-zero emissions by 2070**

New Indian INDCs

Cabinet approves new climate policy

India is now committed to achieve new targets to ease burden on climate by the year 2030

INDIA'S UPDATED NATIONALLY DETERMINED CONTRIBUTION

India now stands committed to reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level

To promote sustainable lifestyle, 'LIFE'— 'Lifestyle for Environment' as a key to combating climate change" has been added to NDC

Achieve about 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by

2030

INDIA'S FIRST NDCs SUBMITTED IN 2015

Reduce the emissions intensity of GDP by 33 to 35 percent compared to 2005 levels

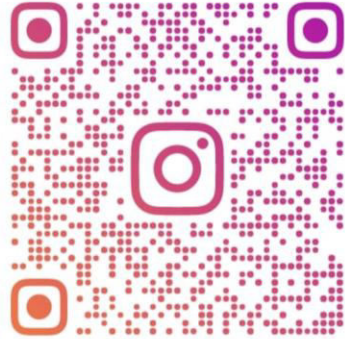
Create an additional carbon sink of 2.5- 3 billion tonnes of CO2 equivalent through additional tree cover

Cumulative electric power installed capacity from non-fossil sources to reach





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