

CLIMATE CHANGE AND ITS IMPACT ON INDIA



OUR TEAM



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WHAT IS CLIMATE CHANGE?

Climate change refers to significant and lasting changes in Earth's climate patterns, primarily attributed to human activities such as burning fossil fuels and deforestation. These activities release greenhouse gases into the atmosphere, trapping heat and causing global temperatures to rise. This warming leads to a cascade of impacts, including more frequent and severe weather events, rising sea levels, loss of biodiversity, and disruptions to ecosystems and human societies worldwide. Addressing climate change requires urgent and coordinated action to mitigate emissions, adapt to current and future changes, and transition to a more sustainable and resilient future.

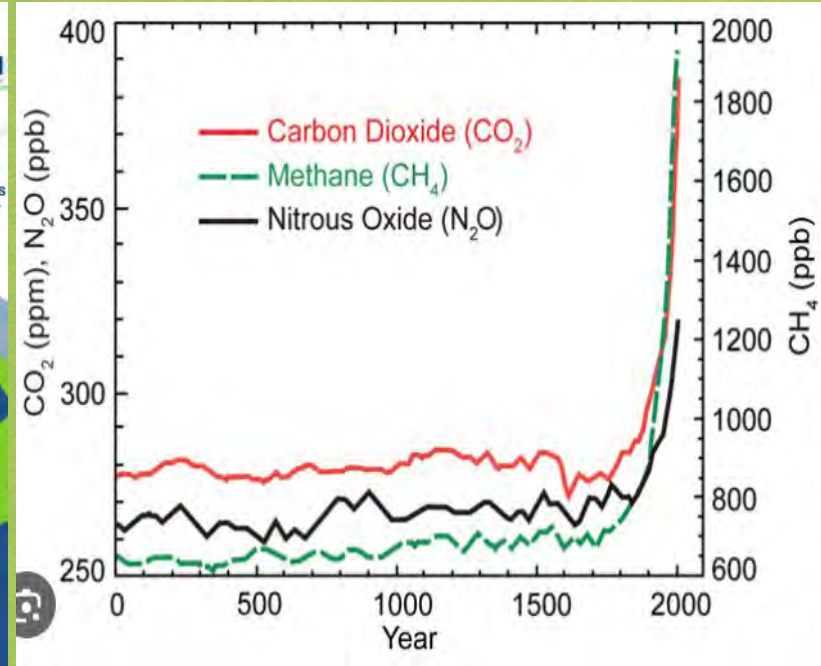
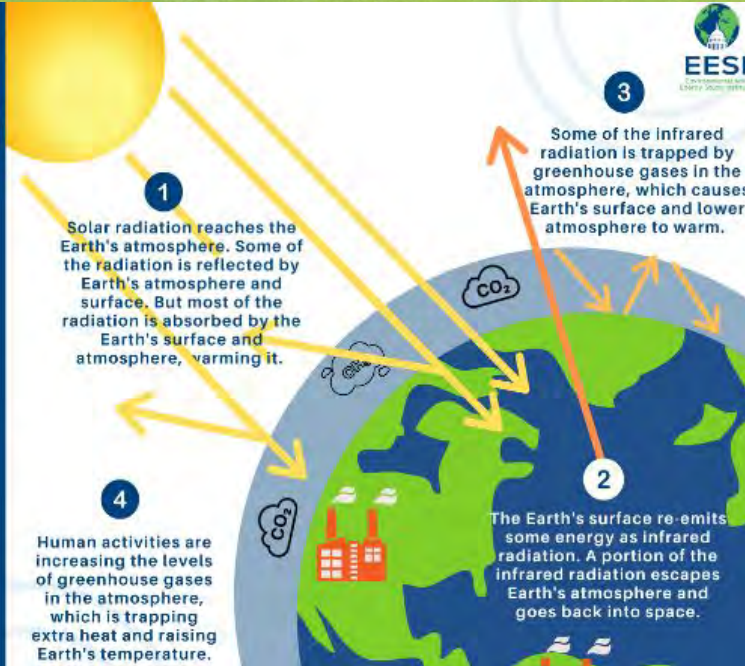


SCIENCE OF CLIMATE CHANGE:

GUIDE TO THE GREENHOUSE EFFECT

The greenhouse effect is a natural process in which atmospheric gases trap the sun's heat and warm the Earth's surface and lower atmosphere. This makes Earth hospitable for life.

Human activities, such as burning fossil fuels for transportation and electricity generation, are increasing the concentration of greenhouse gases in the atmosphere. This enhances the greenhouse effect, trapping extra heat in the Earth's atmosphere and slowly warming the planet.



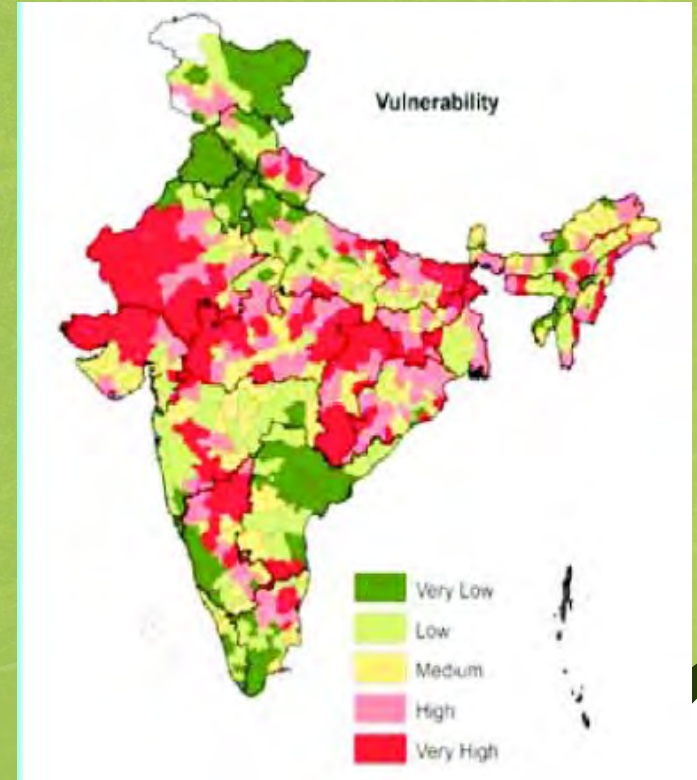
Change in GHG concentration over the last 2000 years

Assessment by IPCC:

- ❑ **Observed Temperature Trends:** The IPCC reports typically highlight the observed trends in global surface temperatures over the past century or more. They consistently show a clear and significant warming trend, with the past few decades being the warmest on record.
- ❑ **Attribution of Warming:** The IPCC assesses the extent to which observed global warming can be attributed to human activities, particularly the emission of greenhouse gases such as carbon dioxide from burning fossil fuels.
- ❑ **Projected Future Warming:** The IPCC's assessments include projections of future global temperature changes under various scenarios of greenhouse gas emissions, known as Representative Concentration Pathways (RCPs). The projections indicate that without significant reductions in emissions, global temperatures will continue to rise throughout the 21st century, with potentially severe consequences for the planet's climate system and ecosystems.
- ❑ **Regional Variability:** The IPCC also assesses how global temperature changes are distributed geographically, highlighting regional variations in warming trends and their impacts on different parts of the world.
- ❑ **Uncertainty and Confidence Levels:** The IPCC's assessments provide a nuanced understanding of the uncertainties inherent in climate science, including uncertainties in climate models, data quality, and future emissions pathways. These assessments assign confidence levels to various findings based on the strength of the scientific evidence and expert judgment.

CLIMATE CHANGE CURRENT UPDATES OF INDIA

- Rising Temperature
- Biodiversity Loss
- Coastal Vulnerability
- Melting Himalayan Glaciers
- Erratic Monsoon Patterns
- Socio Economic Impacts



FUTURE PROJECTIONS OF CLIMATE CHANGE ON INDIA

- **Temperature rise:** Predicted increase of 1.5°C to 4.5°C by the end of the century.
- **Monsoon changes:** Uncertainty in intensity, but overall trend towards more extreme events.
- **Glacier retreat:** Accelerated melting with potential consequences for water security.
- **Coastal risks:** Continued sea-level rise and heightened vulnerability of coastal communities.



IMPACTS ON INDIA

- **Agriculture:** Changes in crop yields, water availability, and pest dynamics.
- **Water resources:** Stress on freshwater sources, affecting agriculture and drinking water supply.
- **Health:** Increased incidence of heat-related illnesses and vector-borne diseases.
- **Economy:** Disruptions to infrastructure, tourism, and livelihoods in vulnerable sectors.



ADAPTATION STRATEGIES AND POLICY RECOMMENDATIONS

- Enhancing agricultural resilience through drought-resistant crops and efficient water management.
- Investing in climate-resilient infrastructure and urban planning.
- Strengthening early warning systems and disaster preparedness.
- Promoting renewable energy and sustainable practices to reduce greenhouse gas emissions.
- Implementation of national and regional climate action plans.
- Integration of climate considerations into development policies and programs.
- Collaboration with international partners for technology transfer and capacity building.
- Empowerment of vulnerable communities to adapt and mitigate climate impacts.



AWESOME WORDS

"Climate change is the ultimate test of humanity's ability to act together as a unified force for the common good."

—BAN KI-MOON



REFERENCES

- 1. Definition of Climate Change:
 - Intergovernmental Panel on Climate Change (IPCC) website: [IPCC Climate Change 2021: The Physical Science Basis] (<https://www.ipcc.ch/report/ar6/wg1/>)
 - NASA Climate Change: [Climate Change: Vital Signs of the Planet] (<https://climate.nasa.gov/>)
- 2. Impacts of Climate Change on India:
 - Ministry of Environment, Forest and Climate Change, Government of India: [Climate Change Impacts in India] (<https://www.moef.gov.in/en/climate-change/impact-of-climate-change>)
 - Center for Climate Change and Sustainability Studies, Tata Institute of Social Sciences: [Climate Change Impacts on India] (https://tiss.edu/uploads/files/Climate_Change_and_India.pdf)
- 3. Future Projections:
 - IPCC reports: [IPCC Reports and Publications] (<https://www.ipcc.ch/reports/>)
 - National Oceanic and Atmospheric Administration (NOAA): [Climate Prediction Center] (<https://www.cpc.ncep.noaa.gov/>)
- 4. Adaptation Strategies:
 - World Bank Group: [Climate Change Adaptation] (<https://www.worldbank.org/en/topic/climatechange/overview#3>)
 - United Nations Framework Convention on Climate Change (UNFCCC): [Adaptation] (<https://unfccc.int/process-and-meetings/the-paris-agreement/adaptation>)
- 5. Policy Recommendations:
 - United Nations Development Programme (UNDP): [Climate Change Policy] (<https://www.undp.org/climate-change>)
 - World Resources Institute (WRI): [Climate Policy] (<https://www.wri.org/our-work/topics/climate-policy>)