

# Climate Change | Important PYQ Topics

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## INTRODUCTION

- Climate change refers to the **long-term changes in the Earth's climate**, including changes in temperature, precipitation, and weather patterns.
- Climate change can make **weather patterns less predictable**. These unforeseen weather patterns can make it **difficult to maintain and grow crops**, making agriculture-dependent countries like India vulnerable.
- It is also causing **damaging weather events** like more frequent and intense hurricanes, floods, cyclones, flooding etc.
- Due to the rising temperature caused by climate change, **the ice in the polar regions is melting at an accelerated rate**, causing sea levels to rise. This is damaging the coastlines due to the increased flooding and erosion.
- **Temperature rise on land is about twice the global average increase**, leading to desert expansion and more common heat waves and wildfires.

## CAUSES

Climate change is caused by a variety of reasons, mainly driven by human factors since 1800s:

- **Human activities (anthropogenic)**
  - Burning fossil fuels
  - Deforestation
  - Land-use changes
  - Atmospheric Aerosols etc.
- **Natural**
  - Sunspot and solar cycle
  - Plate Tectonics
  - Continental Drift
  - Methane emissions from animals etc.

## EFFECTS

- **Extreme Heat:** Under 4°C warming, the west coast and southern India are projected to shift to new, high-temperature climatic regimes with significant impacts on agriculture.
- **Changing Rainfall Patterns:** A **decline in monsoon rainfall since the 1950s** has already been observed. Dry years are expected to be drier and wet years wetter.

- **Droughts:** In 1987 and 2002-2003, **droughts affected more than half of India's crop area** and led to a **huge fall in crop production**. Droughts are expected to be more frequent in some areas, especially in north-western India, Jharkhand, Orissa, and Chhattisgarh. Crop yields are expected to fall significantly because of extreme heat by the 2040s.
- **Groundwater:** Even without climate change, **15% of India's groundwater resources** are overexploited. Falling water tables can be expected to reduce further on account of increasing demand for water from a growing population, more affluent lifestyles, as well as from the services sector and industry.
- **Glacier Melt: Melting glaciers** and the **loss of snow cover** over the Himalayas are expected to threaten the stability and reliability of northern India's primarily glacier-fed rivers. Alterations in the flows of the Indus, Ganges, and Brahmaputra rivers could significantly impact irrigation, affecting the amount of food that can be produced in their basins as well as the livelihoods of millions of people.
- **Sea level rise:** Sea-level rise and storm surges would **lead to saltwater intrusion** in the coastal areas, impacting agriculture, degrading groundwater quality, contaminating drinking water.
- Apart from this **food and energy security** are also major concerns. Water scarcity, health hazards among the masses, and migration and political conflicts are expected to grow.

## WAY FORWARD

- **Global Agreements:** Global agreements, including the **Paris Agreement**, aim to limit global warming to well **below 2 degrees Celsius** above pre-industrial levels.
- **Renewable Energy:** Switching to **renewable energy sources** such as solar, wind, and hydro power is crucial for reducing greenhouse gas emissions and mitigating the impacts of climate change.
- **Adaptation:** Adaptation measures include building sea walls to protect against rising sea levels, improving irrigation systems to deal with droughts, and developing heat-resistant crops.
- **Mitigation:** Mitigation measures include reducing emissions from transportation, improving energy efficiency, and shifting towards low-carbon energy sources.
- **India's Efforts:**
  - National Action Plan on Climate Change.
  - Working on increasing forest cover.
  - **The Nationally Determined Contribution (NDC) report of India** aims at **40%** of energy generation from clean energy by 2030.
  - On a **per capita basis**, India's emissions are **70%** below the world average and **93%** below those of the United States.

- India's **National Solar Mission** is being scaled up five-fold from 20,000 megawatts to **100,000 megawatts**.
- Green Hydrogen Mission.
- **Role of Individuals:** Individual actions can also play a role in addressing climate change, such as reducing energy consumption, using public transportation, and supporting sustainable products and practices.

## CONCLUSION

Climate change is one of the most pressing challenges facing the world today. It requires **urgent action** and **collective effort by governments, businesses, and individuals** to reduce greenhouse gas emissions and adapt to the changing climate. By taking bold and decisive action, **we can mitigate the impacts of climate change and build a more sustainable future.**

## PYQ

**Q. Major cities of India are becoming more vulnerable to flood conditions. Discuss.**

**Q. Assess the impact of global warming on the coral life system with examples.**

**Q. Discuss the concept of air mass and explain its role in macro-climatic changes.**

**Q. Why is there a great concern about the 'microbeads' that are released into environment?**

**a) They are considered harmful to marine ecosystems.**

**b) They are considered to cause skin cancer in children.**

**c) They are small enough to be absorbed by crop plants in irrigated fields.**

**d) They are often found to be used as food adulterants.**