

Climate change and India

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Manifest pedagogy:

Climate change includes not only rising average temperatures but also extreme weather events, shifting wildlife populations and habitats, rising seas, and a range of other impacts. All these changes are emerging as humans add heat-trapping greenhouse gases to the atmosphere. Hence today climate change is a global problem which needs to be tackled in a comprehensive way.

In news: Recently, Prime Minister Narendra Modi has set India's target of net zero greenhouse gas emissions by 2070.

Placing it in syllabus: S&T- Climate

Static dimensions:

- Climate change- General causes and effects

Current dimensions:

- Effects of climate change specifically on India
- India's commitment to mitigate the climate change

Content:

Climate change- General causes and effects:

"Climate change is a broad range of global phenomena created predominantly by burning fossil fuels, which add heat-trapping gases to Earth's atmosphere". – NASA

Causes-

- **Greenhouse gases** play a vital role in the earth's climate cycles. These gases in the atmosphere trap the

reflected energy, redirecting it back down to the earth and eventually contributing to global warming.

- **Solar Activity**– While the sun goes through natural cycles, increasing and decreasing the amount of energy that it emits to the earth, contributes to climate change.
- **Agriculture**- From deforestation in places like the Amazon to the transportation and livestock that it takes to support agricultural efforts around the world, agriculture is responsible for a significant portion of the world's greenhouse gas emissions.
- **Deforestation**- Climate change increases deforestation by way of wildfires and other extreme weather, but deforestation is also a major contributor to global warming through emission of CO₂.
- **Human activity**- Transportation in the form of cars, trucks, ships, trains, and planes emits the largest percentage of CO₂—speeding up global warming and remaining a significant cause of climate change.

Effects-

- Changes to seasonal weather patterns and disrupting food distribution for plants and animals throughout the world, potentially causing mass extinction events.
- Intensify the challenges of global instability, hunger, poverty, and conflict.
- Health risks may include heat-related illness, injuries and fatalities from severe weather, Asthma & cardiovascular disease from air pollution, respiratory problems from increased allergies and diseases from poor water quality.
- Severe weather and increased temperatures will continue to limit crop productivity and increase the demand for water.
- Increasing ocean temperatures and melting ice sheets have steadily contributed to the rise of sea levels on a

global scale, potentially causing increased flooding and decrease in ocean and wetland habitats.

- Ocean Acidification- As pH levels in the ocean decrease, shellfish have difficulty reproducing, and much of the oceans' food cycle becomes disrupted.

Effects of climate change specifically on India:

- India's average temperature has risen by around 0.7°C during 1901–2018. By the end of the 21st century, average temperature over India is projected to rise by approximately 4.4°C relative to the recent past (1976–2005 average).
- The frequency of summer (April–June) heat waves over India is projected to be 3 to 4 times higher by the end of the 21st century, with amplification of heat stress expected across India, particularly over the Indo-Gangetic and Indus river basins.
- Sea surface temperature (SST) of the tropical Indian Ocean has risen by 1°C on average during 1951–2015, markedly higher than the global average SST warming of 0.7°C, over the same period.
- The summer monsoon precipitation has declined by around 6% from 1951 to 2015, with notable decreases over the Indo-Gangetic Plains and the Western Ghats.
- This overall decrease of seasonal summer monsoon rainfall has led to an increased propensity for droughts over India.
- Sea-level rise in the North Indian Ocean (NIO) has accelerated to 3.3 mm per year in the 1993–2017, which is comparable to the current rate of global mean sea-level rise.
- There has been a significant reduction in the annual frequency of tropical cyclones over the NIO basin, but in contrast, the frequency of very severe cyclonic storms (VSCSs) during the post-monsoon season has increased significantly.

- India is projected to potentially lose between 0.8 and 2 percent of its GDP by mid-century.

India's commitment to mitigate the climate change:

- At the 26th Conference of Parties (CoP26), Prime Minister Narendra Modi declared a **five-fold strategy, termed as the 'Panchamrita'**.
- By the year 2070, India will achieve the target of Net Zero.
- India will get its **non-fossil energy capacity to 500 gigawatt (GW) by 2030**.
- India will meet 50 per cent of its energy requirements from renewable energy by 2030.
- India will reduce the total projected carbon emissions by one billion tonnes from now onwards till 2030.
- By 2030, India will **reduce the carbon intensity of its economy by less than 45 per cent**.
- India has abstained from signing a global deal made at COP26 to reduce emissions of methane gas.
- India has resisted setting overall reduction targets, saying industrialised nations should bear a much greater share of the burden as they have contributed far more towards global warming over time.

According to the IPCC, global emissions must halve by 2030 and reach Net Zero by 2050. Given the enormous inequity in emissions in the world, the OECD countries must then reach Net Zero by 2030, China by 2040 and India and the rest of the world by 2050. However, OECD countries have declared a Net Zero target for 2050 and China for 2060.

Solutions for Climate Change-

- Adopting cleaner, more sustainable energy solutions
- Making home energy efficient
- Buying carbon offsets
- Adopting a plant-based diet

- Following 3 Rs- Reduce, Reuse and Recycle
- Stop using fossil fuels
- Stopping deforestation

Mould your thought:

1. What are the effects of climate change? Brief about the commitments India has made to tackle climate change.

Approach to the answer-

- Write the definition of climate change.
- Write the effects of climate change generally and 2-3 sentences about India specifically.
- Write down India's new commitments to mitigate climate change
- Conclusion