Assessment of Climate Change over the Indian Region

GS- PAPER-3 Climate change (PT-MAINS-INTERVIEW)

Recently, the first Assessment of Climate Change over the Indian Region has been published by the Ministry of Earth Sciences (MoES). It is India's first-ever national forecast on the impact of global warming on the subcontinent in the coming century.

- These projections, based on a climate forecasting model developed at the Indian Institute of Tropical Meteorology (IITM), Pune, will be part of the next report of the Intergovernmental Panel on Climate Change (IPCC), expected to be ready in 2022.
- This is a significant step for climate science and policy in India because existing projections are put in the context of historical trends in land and ocean temperatures, monsoon rainfall, floods, droughts and Himalayan warming and glacier loss.

The report highlights are as follows

- The report indicates a rise in worldwide average surface air temperatures by 5°C by the end of the century if human activities keep emitting GHGs at the current rate.
- The global average temperature in the last century has gone up by 1.1°C, according to the latest estimates by the IPCC.
- Another significant highlight of the assessment is the projected variability in the rainfall, especially during the monsoon season which brings 70% of the rainfall received by India and is one of the primary drivers of its rural agrarian economy.
- Monsoon rainfall could change by an average of 14% by 2100 that could go as high as 22.5%.
- It is not mentioned if this change will be an increase or a decrease but still represents variability.
- Overall rainfall during the monsoon season has decreased by 6% between 1950 and 2015.

Representative Concentration Pathway (RCP)

- According to Assessment of Climate Change over the Indian Region, in a worst-case scenario, average surface air temperatures over India could rise by up to 4.4°C by the end of the century as compared to the period between 1976 and 2005.
- The worst-case scenario is defined by the Representative Concentration Pathway (RCP) 8.5 that calculates a radiative forcing of 8.5 watt per square metre due to the rising greenhouse gas (GHG) emissions in the atmosphere.
- Radiative forcing or climate forcing is the difference between sunlight energy absorbed by the Earth (including its atmosphere) and the energy that it radiates back into space.
- Under an intermediate scenario of RCP 4.5, the country’s average temperature could rise by up to 2.4°C.
- The rise in temperatures will be even more pronounced in the Hindu Kush-Himalayan region where the average could reach 5.2°C.
- The region is already highly vulnerable to climate-related variability in temperatures, rainfall and snowfall.
- By 2100, the frequency of warm days and warm nights might also increase by 55%
and 70% respectively, as compared to the period 1976-2005 under the RCP 8.5 scenario.

- The incidences of heat waves over the country could also increase by three to four times.
- Their duration of occurrence might also increase which was already witnessed by the country in 2019.