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(Mains GS 3 : Conservation, environmental pollution and degradation, environmental impact assessment.)

Context:

Recently, the world has seen unexpected floods in Europe and China, record-breaking heat-waves in the United States, and deadly forest fires in Siberia, and Turkey and Greece.

The Intergovernmental Panel on Climate Change (IPCC) Report:

- Amid gloomy predictions of a continued rise in the frequency and intensity of such extreme weather events, all attributable to global warming, scientists are set to present the most comprehensive health check-up of the Earth's climate.
- The Geneva-based Intergovernmental Panel on Climate Change (IPCC) will release the first part of its Sixth Assessment Report, the periodic status check that has now become the most widely accepted scientific view of the state of the Earth's climate.
- This part of the report will present the latest scientific understanding of the climate system, how and why it is changing, and the impact of human activities on this process.
- The second and third parts of the report, dealing with the expected impacts of climate change, and the actions required to prevent the worst impacts, are slated to come out next year.

The Assessment Reports

- The five previous assessment reports that have come out since the IPCC was established in 1988 have formed the basis of international climate change negotiations, and the actions that governments across the world have been taking in the last three decades to restrict the rise of global temperatures.

- Their value has been globally acknowledged, and the fourth assessment report, which came out in 2007, won the IPCC the Nobel Peace Prize.

Updated knowledge and understanding:

- Each of these voluminous reports have built upon the previous ones with updated knowledge and understanding of the climate system.
- All of them, starting from the first one in 1990, have been categorical in stating that the rise in global surface temperatures since the 1950s was most likely caused by human activities.
- Reports further suggested that any rise beyond 2°C, compared to the temperatures of the late 19th century, would make the Earth an extremely difficult place to live for human beings, and thousands of other species of plants and animals.
- The reports have also presented projections for temperature rise till 2100 under different scenarios and the kind of impacts that can be expected under each of these pathways.

PREVIOUS IPCC ASSESSMENT REPORTS: HIGHLIGHTS

FIRST REPORT, 1990

- Emissions resulting from human activities are increasing atmospheric concentrations of greenhouse gases
- Global temperatures have risen by 0.3°–0.6°C in 100 years. In business-as-usual scenario, likely to increase by 2°C compared to pre-industrial levels by 2025, and 4°C by 2100
- Sea-level likely to rise 65 cm by 2100
- Report formed basis for negotiation of UN Framework Convention on Climate Change in 1992

SECOND REPORT, 1995

- Revises projected rise in global temperatures to 3°C by 2100, and sea-level rise to 50 cm
- The scientific underpinning for Kyoto Protocol in 1997

THIRD REPORT, 2001

- Revises predicted temperature rise to 1.4°–5.8°C by 2100 compared to 1990
- Rainfall to increase; sea-level likely to rise by 80 cm from 1990 by 2100.
- Frequency, intensity and duration of extreme weather events to increase
- Presents new and stronger evidence

to suggest most of warming attributable to human activities

FOURTH REPORT, 2007

- Greenhouse gas emissions rose by 70% between 1970 and 2004
- Atmospheric concentrations of CO₂ in 2005 (379 ppm) the highest in 650,000 years
- In worst-case scenario, global temperatures could rise 4.5°C by 2100 from pre-industrial levels; sea-levels could be 60 cm higher than in 1990
- Wins 2007 Peace Nobel for IPCC
- Report is the scientific input for the 2009 Copenhagen climate meeting

FIFTH REPORT, 2014

- Temperature rise by 2100 could be 4.8°C from pre-industrial times
- Atmospheric concentrations of CO₂, CH₄ and N₂O “unprecedented” in last 800,000 years
- More frequent and longer heat waves “virtually certain”
- “Large fraction of species” face extinction
- Forms scientific basis for negotiations of Paris Agreement in 2015

The Sixth Assessment Report:

Apart from incorporating the latest available scientific evidence, the Sixth Assessment Report is also attempting to provide more actionable information to help governments take policy decisions.

Regional focus:

- Thus far, the IPCC assessment reports have been presenting global scenarios.
- However, there are likely to be wide variations in the expected impacts of climate change from region to region, as acknowledged by the assessment reports themselves.
- The Sixth Assessment Report will put much more emphasis on regional assessment.

- So, it is expected that this report would likely state what the scenarios for sea-level rise in the Bay of Bengal region is, not just what the average sea-level rise across the world is likely to be.

Extreme events:

- There is expected to be bigger focus on extreme weather events, like the ones we have seen in the last few weeks across the globe.
- Linking individual extreme events to climate change has always been debatable.
- But in the last few years, there has been significant advancement in attribution science, allowing scientists to say whether a particular event was a result of climate change.

Cities:

- Densely populated mega-cities are supposed to be among the most vulnerable to impacts of climate change.
- The Sixth Assessment Report is expected to present specific scenarios the climate change impacts on cities and large urban populations, and also implications for key infrastructure.

Synergies:

IPCC is expected to present a more integrated understanding of the situation, cross-link evidence and discuss trade-offs between different options or pathways, and also likely to cover social of climate change action by countries.

Influence of the IPCC Reports:

- The IPCC assessment reports have been extremely influential in directing the dialogue and action on climate change.
- The First Assessment Report led to the setting up of the UN Framework Convention on Climate Change, the umbrella agreement under which international negotiations on climate change take place every year.
- The Second Assessment Report was the basis for the 1997 Kyoto Protocol that ran till last year, and the Fifth Assessment Report, which came out in 2014, guided the Paris Agreement.

Conclusion:

- The global climate architecture is now governed by the Paris Agreement, which replaced the Kyoto Protocol from this year.

- There have been enough indications to suggest that global action was far below what was needed to keep the temperatures below 2°C, as mandated under the Paris Agreement.
- In the immediate future, the IPCC report could serve as the most important warning towards the rapidly closing window of opportunity to halt the rise in temperatures to unacceptable levels, and propel the governments to take more urgent actions.