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An Institute for Civil Services

**GIST OF IMPORTANT
REPORT**

**PART
THREE OF SIXTH
ASSESSMENT REPORT**

By: IPCC

For Civil Services Examination

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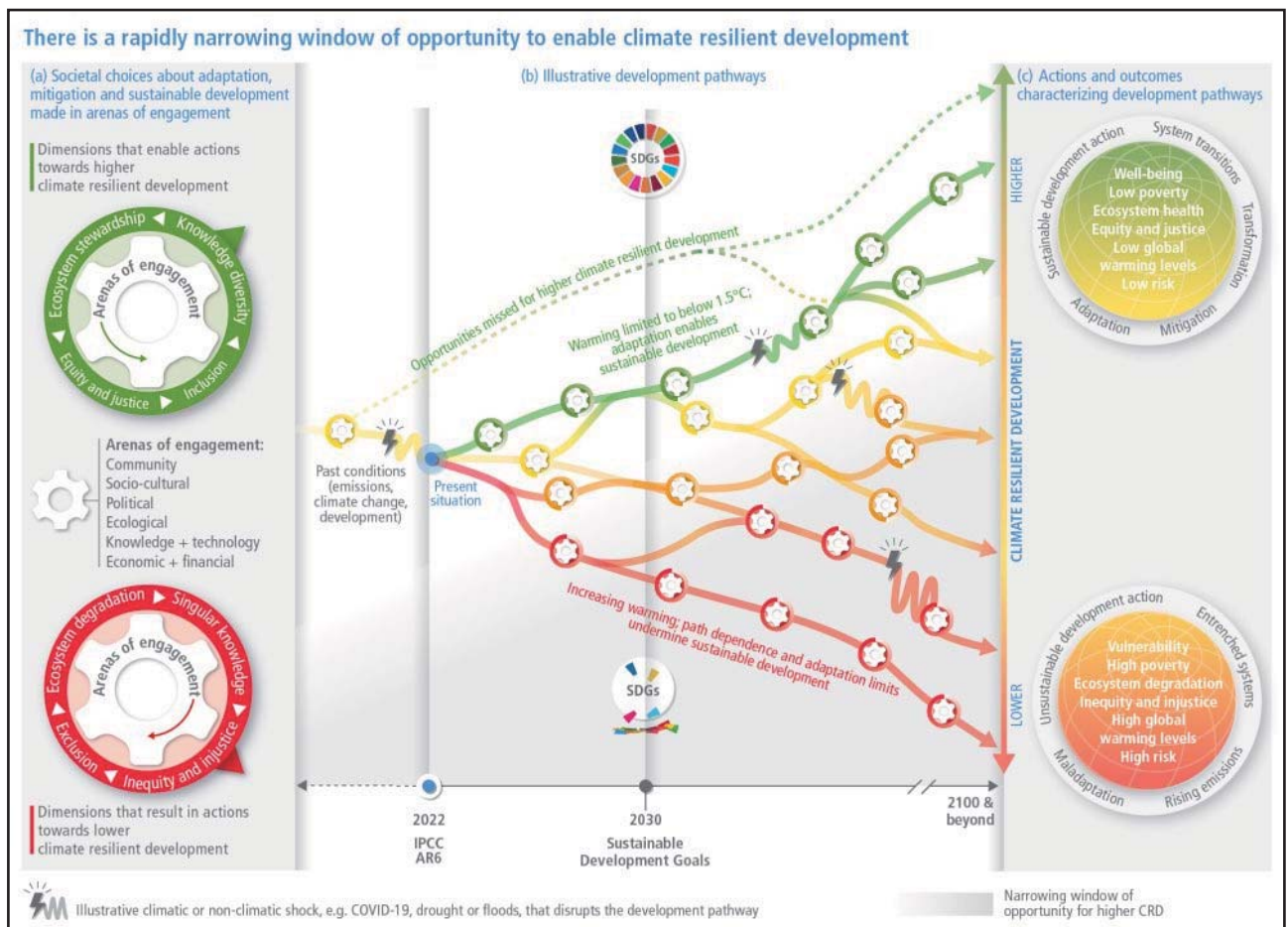
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IPCC: PART THREE OF SIXTH ASSESSMENT REPORT

- **Theme:** Climate Change 2022: Mitigation of Climate Change
- **About:** The IPCC published the third, and final, part of its sixth assessment report, authored by Working Group 3.
- **Second part of the report:** Was about climate change impacts, risks and vulnerabilities, and adaptation options.
- **First part of the report:** was about physical science of climate change in 2021.



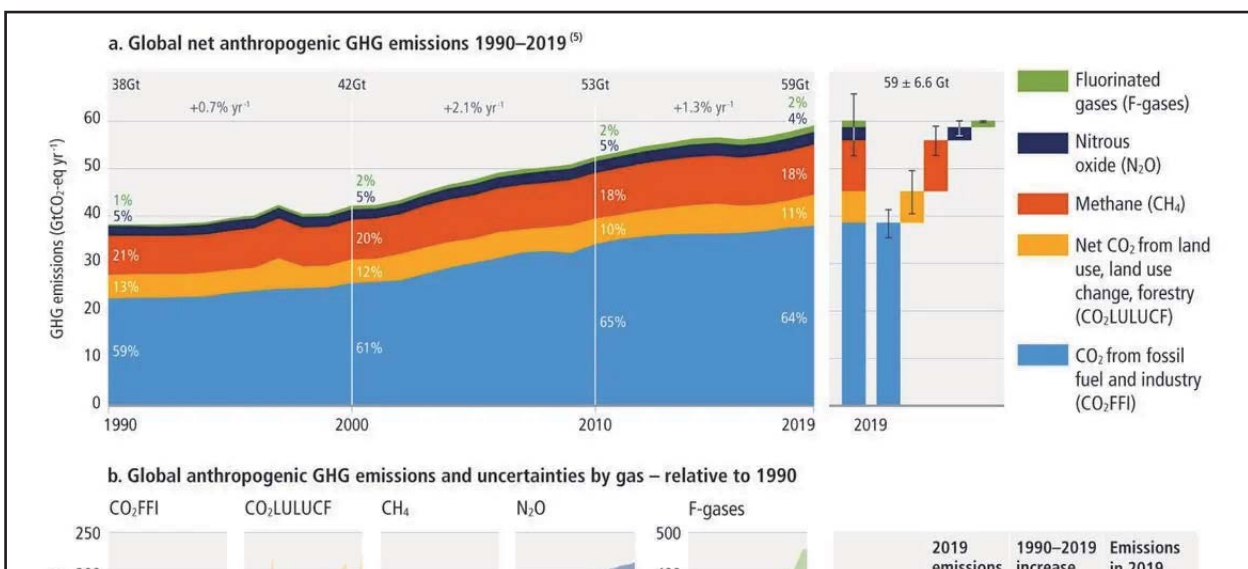
Key Highlights of the Report:

- Global temperatures are already at 1.1 degrees above pre-industrial levels.
- The years between 2010 and 2019 saw the highest emissions in human history (at 56 gigatonnes of carbon dioxide or its equivalent).
- In order to keep global temperatures to 1.5 degrees above pre-industrial levels, emissions would need to peak by 2025, and fall right after, with “rapid and deep” reductions following every decade till 2050.
- North America has been responsible for the highest share of historical cumulative emissions (23 per cent), as well as the highest per capital emissions (15 tonnes of CO₂), which is almost 20 times higher than that by an average person in the African continent.
- Developed countries have failed to deliver on their promise of mobilising \$100 billion in climate finance, for developing countries to adapt to and mitigate the effects of climate change.

- Anthropogenic emissions:** Emissions of greenhouse gases (GHGs), precursors of GHGs and aerosols caused by human activities. These activities include the burning of fossil fuels, deforestation, land use and land-use changes (LULUC), livestock production, fertilisation, waste management and industrial processes.
- Net emissions:** means gross emissions (including all industrial activities, mostly fossil fuel combustion) minus carbon sinks from forestry activities and agricultural soils.

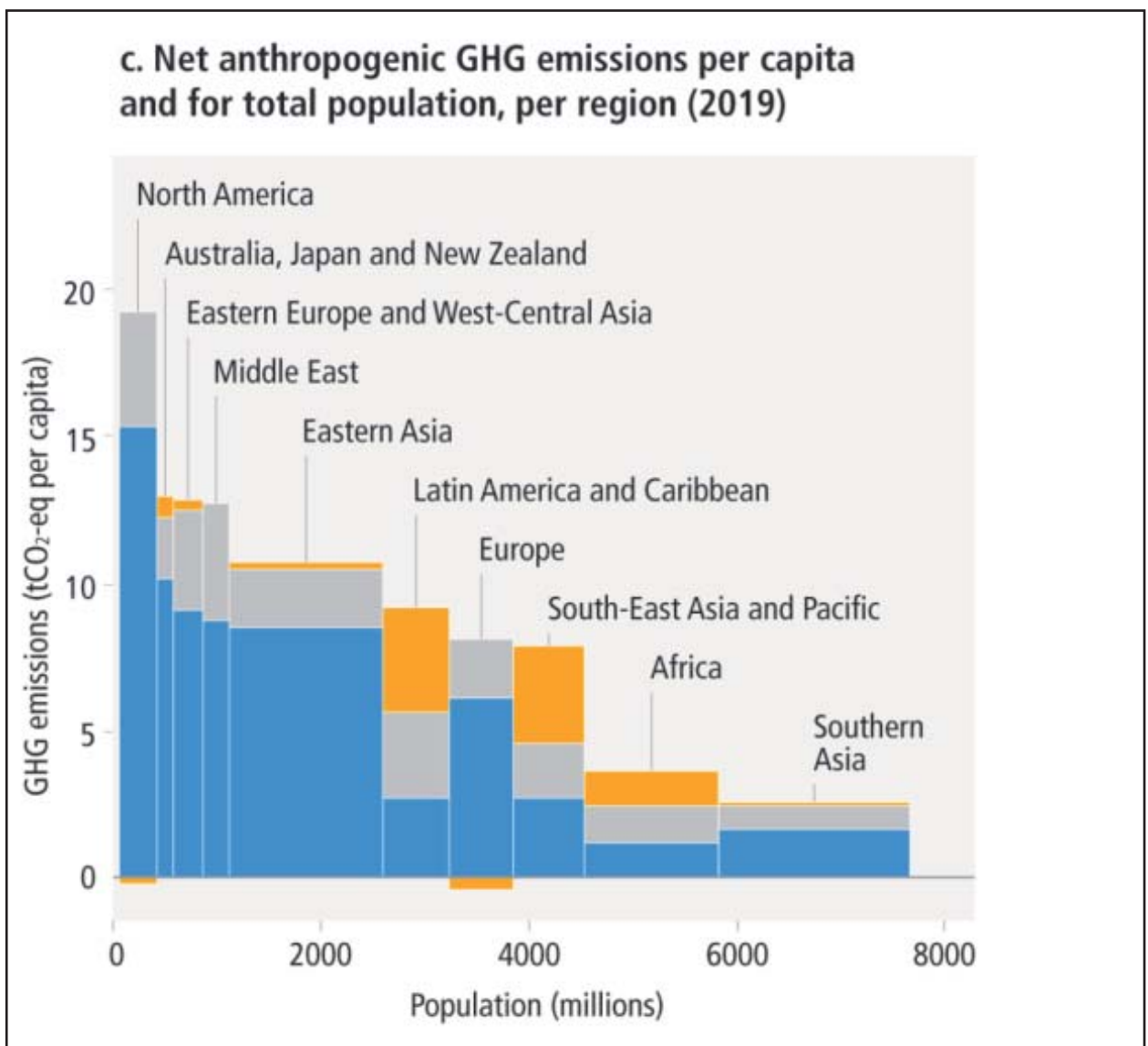
Green House Gas Emissions:

- Total net anthropogenic GHG emissions have continued to rise during the period 2010–2019, as have cumulative net CO₂ emissions since 1850.
- Average annual GHG emissions during 2010-2019 were higher than in any previous decade, but the rate of growth between 2010 and 2019 was lower than that between 2000 and 2009.
- Global net anthropogenic Greenhouse gas (GHG) emissions were at 59 Gigatonnes of carbon dioxide equivalent (GtCO₂e) in 2019 which is 54% higher than in 1990.
- Net anthropogenic GHG emissions have increased since 2010 across all major sectors globally. An increasing share of emissions can be attributed to urban areas.
- In 2019, approximately 34% of total net anthropogenic GHG emissions came from the energy supply sector, 24% from industry, 22% from agriculture, forestry and other land use (AFOLU), 15% from transport and 6% from buildings.



Regional Contributions:

- Regional contributions to global GHG emissions continue to differ widely. Variations in regional, and national per capita emissions partly reflect different development stages, but they also vary widely at similar income levels.
- The 10% of households with the highest per capita emissions contribute a disproportionately large share of global household GHG emissions.
- In 2019, LDCs are estimated to have emitted 3.3% of global GHG emissions.
- In 2019, around 48% of the global population lives in countries emitting on average more than 6t CO₂-eq per capita, 35% live in countries emitting more than 9 tCO₂-eq per capita. Another 41% live in countries emitting less than 3 tCO₂-eq per capita.



Household Emissions:

- Consumption-based emissions refer to emissions released to the atmosphere to generate the goods and services consumed by a certain entity (e.g., a person, firm, country, or region).
- Globally, the 10% of households with the highest per capita emissions contribute 34-45% of global consumption-based household GHG emissions.

- At least 18 countries have sustained production-based GHG and consumption-based CO₂ emission reductions for longer than 10 years. Reductions were linked to energy supply decarbonisation, energy efficiency gains, and energy demand reduction, which resulted from both policies and changes in economic structure.

COP26 and NDCs Commitment:

- Global emissions in 2030 associated with the implementation of NDCs announced prior to COP26 are lower than the emissions implied by the original NDCs.
- Original NDCs refer to those submitted to the UNFCCC in 2015 and 2016. The original emission gap has fallen by about 20% to one third relative to pathways that limit warming to 2°C (>67%) with immediate action.
- Modelled global emission pathways consistent with NDCs announced prior to COP26 will likely exceed 1.5°C during the 21st century.

Challenges:

- CCS refers to highly contentious technologies that can trap and store carbon dioxide from the atmosphere. These have been a point of division among climate activists and researchers, because they are not yet scalable, are expensive, and their ecological costs are still not fully known.
- Tracked financial flows fall short of the levels needed to achieve mitigation goals across all sectors and regions.
- The challenge of closing gaps is largest in developing countries as a whole.
- Innovation has lagged in developing countries due to weaker enabling conditions.
- Digitalisation can enable emission reductions, but can have adverse side-effects unless appropriately governed.
- Adoption of low-emission technologies lags in most developing countries, particularly least developed ones, due in part to weaker enabling conditions, including limited finance, technology development and transfer, and capacity.

Steps taken by different countries:

- The unit costs of several low-emission technologies have fallen continuously since 2010. Innovation policy packages have enabled these cost reductions and supported global adoption.
- Both tailored policies and comprehensive policies addressing innovation systems have helped overcome the distributional, environmental and social impacts potentially associated with global diffusion of low-emission technologies.
- From 2010–2019, there have been sustained decreases in the unit costs of solar energy (85%), wind energy (55%), and lithium-ion batteries (85%), and large increases in their deployment, e.g., >10x for solar and >100x for electric vehicles (EVs).
- This has majorly been due to mix of policy instruments which reduced costs and stimulated adoption includes public R&D, funding for demonstration and pilot projects, and demand pull instruments such as deployment subsidies to attain scale.
- Appropriately designed policies and governance have helped address distributional impacts and rebound effects.

Suggestions:

◦ Modelled mitigation strategies:

- ▶ To achieve these reductions include transitioning from fossil fuels without Carbon Capture and Storage (CCS) to very low — or zero — carbon energy sources, such as renewables or fossil fuels with CCS, demand side measures and improving efficiency, reducing non-CO2 emissions, and deploying carbon dioxide removal (CDR) methods to counterbalance residual GHG emissions.

◦ Shifting Development Pathways in Urban Spaces:

- ▶ A growing source of emissions comes from urban spaces, which also provides an opportunity for governments to “systematically transition” to low carbon development pathways.
- ▶ One way to do this is to introduce demand-side mitigation measures, and inspire behavioral changes — aspects of climate change mitigation explored by the IPCC for the first time.
- ▶ Other methods include moving towards electric vehicles, and designing cities in a way to ensure that the demand for personal transport is low.
- ▶ Lifestyle and infrastructure changes could lead to a 40 to 70 per cent reduction in emissions by 2050.

◦ Digital Technologies:

- ▶ Digital technologies can contribute to mitigation of climate change and the achievement of several SDGs.
- ▶ For example, sensors, Internet of Things, robotics, and artificial intelligence can improve energy management in all sectors, increase energy efficiency, and promote the adoption of many low-emission technologies, including decentralized renewable energy, while creating economic opportunities.
- ▶ Digitalization can involve trade-offs across several SDGs, e.g., increasing electronic waste, negative impacts on labor markets, and exacerbating the existing digital divide.

Intergovernmental Panel on Climate Change (IPCC):

- The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations responsible for advancing knowledge on human-induced climate change.
- It was established in 1988 by the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP), and later endorsed by United Nations General Assembly.
- Headquartered in Geneva, Switzerland, it is composed of 195 member states.
- The IPCC provides objective and comprehensive scientific information on anthropogenic climate change, including the natural, political, and economic impacts and risks, and possible response options.
- Every few years (about 7 years), the IPCC produces assessment reports.

Working Groups of IPCC:

- The IPCC work is shared among three Working Groups, a Task Force and a Task Group.
- The activities of each Working Group and of the Task Force are coordinated and administrated by a Technical Support Unit (TSU).

■ Working Group I:

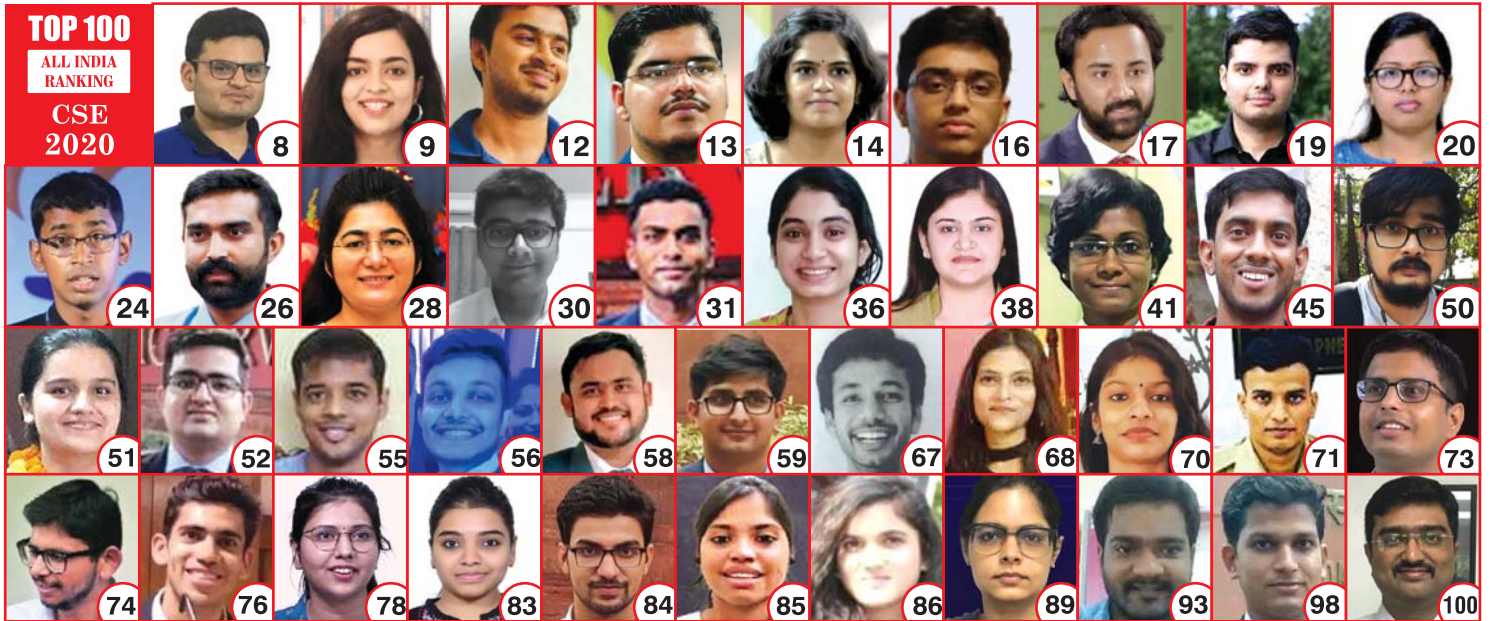
- The IPCC Working Group I (WGI) aims at assessing the physical scientific basis of the climate system and climate change.

■ **Working Group II:**

- It assesses the vulnerability of socio-economic and natural systems to climate change, negative and positive consequences of climate change and options for adapting to it.

■ **Working Group III:**

- It focuses on climate change mitigation, assessing methods for reducing greenhouse gas emissions, and removing greenhouse gases from the atmosphere.



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