



Revision Series

Environment

(Part - 1)

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Topics to be Covered

Climate Change

Emissions Gap Report 2020

- The United Nations Environment Programme (UNEP) released its annual Emissions Gap Report 2020.
- The annual report from UNEP measures the gap between anticipated emissions and levels consistent with the Paris Agreement goals of limiting global warming this century to well below 2°C and pursuing 1.5°C.

Findings

- Global GHG emissions continued to grow for the third consecutive year in 2019, reaching a record high of 52.4 Gigatonne carbon equivalent (GtCO₂e) without including land use changes (LUC).
- Fossil carbon dioxide (CO₂) emissions (from fossil fuels and carbonates) dominate total GHG emissions including LUC (65 per cent) and consequently the growth in GHG emissions.
- There is some indication that the growth in global GHG emissions is slowing.
- However, GHG emissions are declining in Organisation of Economic Cooperation and Development (OECD) economies and increasing in non-OECD economies.
- Over the last decade, the top four emitters (China, the United States of America, EU27+UK and India) have contributed to 55% of the total GHG emissions without LUC.
- The top seven emitters (including the Russian Federation, Japan and international transport) have contributed to 65%, with G20 members accounting for 78%.
- There is a general tendency that rich countries have higher consumption-based emissions (emissions allocated to the country where goods are purchased and consumed, rather than where they are produced) than territorial-based emissions, as they typically have cleaner production, relatively more services and more imports of primary and secondary products.
- Even though rich countries have had higher consumption-based emissions than territorial-based emissions over the last decade, both emission types have declined at similar rates.

NDCs - India

- India is the only major G20 country that was on track towards keeping to its nationally determined commitments to halt runaway global warming.
- In 2015, ahead of the United Nations' significant climate conference in Paris, India announced three major voluntary commitments called the Nationally Determined Contributions (NDC).
 - Improving the emissions intensity (volume of emissions per unit of GDP) of its GDP by 33 to 35 per cent by 2030 below 2005 levels.
 - Increasing the share of non-fossil fuels-based electricity to 40 per cent by 2030.
 - Enhancing its forest cover, thereby absorbing 2.5 to 3 billion tonnes of carbon dioxide.
- India has already achieved 21% of emissions intensity target, the share of renewables in our energy mix is 37.9% and our tree cover has increased by 15,000 square kilometre in six years.

Climate Ambition Summit 2020

- It was jointly hosted by the United Nations, the United Kingdom and France, in partnership with Chile and Italy to mark the fifth anniversary of the adoption of the Paris Agreement.

India: Transforming to a net-zero emissions energy system

- The Energy and Resources Institute (TERI) and Shell have released a report titled "India: Transforming to a Net-Zero Emissions Energy System".
- It illustrates a pathway to steer the domestic energy system towards net-zero emissions by 2050, while achieving India's sustainable economic development ambitions.
- It is technologically possible but highly challenging.

Adaptation Report 2020

- The annual cost of adaptation to the effects of climate change for developing countries is estimated to at least quadruple by 2050, according to the UNEP Adaptation Gap Report, 2020.
- The current cost for these countries is in the range of \$70 billion (Rs 5.1 lakh crore) and may rise to \$140-300 billion in 2030 and \$280-500 billion in 2050.

- Adaptation cost includes costs of planning, preparing for, facilitating and implementing adaptation measures.
- The ever-increasing adaptation cost has also outpaced the growth in adaptation finance that refers to the flow of funds to developing countries to help them tide over the damages caused by weather events from climate change.
- This, in turn, has kept the adaptation finance gap from closing with the current efforts, although the fund flow has increased, the report said.
- Adaptation costs, in actual terms, is higher in developed countries but the burden of adaptation is greater for developing countries in relation to their gross domestic product.

UNEP

- It coordinates the UN's environmental activities.
- It was founded as a result of the United Nations Conference on the Human Environment 1972.

Reports and Publications

- **Actions on Air Quality.**
- **Global Environment Outlook.**
- **Frontiers.**
- **Invest into Healthy Planet.**
- As a member of the United Nations Development Group, UNEP aims to help the world meet the 17 Sustainable Development Goals.
- UNEP hosts the secretariats of several multilateral environmental agreements and research bodies, including
 - The Convention on Biological Diversity (CBD).
 - The Minamata Convention on Mercury.
 - The Convention on Migratory Species.
 - The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

- In 1988, the World Meteorological Organization and UNEP established the Intergovernmental Panel on Climate Change (IPCC).
- UNEP is also one of several Implementing Agencies for the Global Environment Facility (GEF) and the Multilateral Fund for the Implementation of the Montreal Protocol.

Nitrous Oxide Emissions

- Human emissions of nitrous oxide (N₂O) – a greenhouse gas 300 times more potent than carbon dioxide (CO₂) increased by 30 per cent between 1980 and 2016, according to a research paper published in Nature October 7, 2020.
- It has the third-highest concentration – after CO₂ and methane – in our atmosphere among greenhouse gases responsible for global warming.
- N₂O can live in the atmosphere for up to 125 years.
- Its global concentration levels increased from 270 parts per billion (ppb) in 1750 to 331 ppb in 2018 – a jump of 20 per cent.
- The study found that 43% of the total emissions came from human sources and most N₂O emissions came from emerging countries like India, China and Brazil.
- A major proportion of the N₂O emissions in the last four decades came from the agricultural sector, mainly because of the use of nitrogen-based fertilisers.
- The research was conducted through an international collaboration between the International Nitrogen Initiative (INI) and the Global Carbon Project of Future Earth, a partner of the World Climate Research Programme.
- This is the most comprehensive study of global nitrous oxide emissions ever published, as it combines both natural and anthropogenic (man-made) sources.

Brown Carbon Tarballs

- Himalaya-Tibetan Plateau is known as the “third pole” because the region has the largest reserve of glacial snow and ice outside of the north and south poles.
- The glaciers, which are extremely sensitive to climate change and human influence, have been retreating over the past decade.
- Researchers have detected light-absorbing “tarballs” in the Himalayan atmosphere, which could contribute to glacial melt.

- Burning biomass or fossil fuels releases light-absorbing, carbonaceous particles that can deposit on snow and ice, possibly hastening the melting of glaciers.
- Previous research has shown that one type of particle, called black carbon, can be transported long distances by wind to the Himalayan atmosphere.
- But much less is known about the presence of brown carbon, a particle that can form tarballs -- small, viscous spheres consisting of carbon, oxygen and small amounts of nitrogen, sulfur and potassium.
- Using electron microscopy, the researchers unexpectedly found that about 28% of the thousands of particles in the air samples from the Himalayan research station were tarballs, and the percentage increased on days with elevated levels of pollution.

Green - Ag Project

- The Union government in 2020 (until March 31, 2026), launched the Green-Ag Project in Mizoram, to reduce emissions from agriculture and ensure sustainable agricultural practices.
- Mizoram is one of the five states where the project will be implemented.
- Other states include Rajasthan, Madhya Pradesh, Odisha and Uttarakhand.
- The Green-Ag Project is funded by the Global Environment Facility, while the Department of Agriculture, Cooperation, and Farmers' Welfare (DAC&FW) is the national executing agency.
- Other key players involved in its implementation are Food and Agriculture Organization (FAO) and the Union Ministry of Environment, Forest and Climate Change (MoEF&CC).
- The project is designed to achieve multiple global environmental benefits in at least 1.8 million hectares (ha) of land in five landscapes, with mixed land use systems.
- It aims to bring at least 104,070 ha of farms under sustainable land and water management.
- The project will also ensure 49 million Carbon dioxide equivalent (CO₂eq) sequestered or reduced through sustainable land use and agricultural practices.

Decarbonising Transport Project

- NITI Aayog and the International Transport Forum (ITF) of OECD jointly launched the 'Decarbonizing Transport in Emerging Economies' (DTEE) project in India.
- The ambitious five-year project will help India develop a pathway towards a low-carbon transport system through the development of modelling tools and policy scenarios.
- Transport emits around 23% of the energy related CO₂ that feeds global warming.
- Without immediate action, its share could reach 40% by 2030 and 60% by 2050.
- The transport sector of India is the third most greenhouse gas (GHG) emitting sector, where the major contribution comes from the road transport sector.
- Out of the total carbon dioxide emissions in India, 13% come from the transport sector.
- These emissions have more than tripled since 1990.
- In India, CO₂ emitted per inhabitant was just about a twentieth of that of an average OECD country, yet, India's transport CO₂ emissions are likely to increase by almost 6% annually to 2030.
- This project will help to
 - Develop a pathway towards a low-carbon transport system for India.
 - Design a tailor-made transport emissions assessment framework for India.
 - Facilitate the government with a comprehensive understanding of present as well as future transport activities along with the related CO₂ emissions.
- It is part of the Decarbonizing Transport in Emerging Economies family of projects, which supports transport decarbonization across different world regions.
- India, Argentina, Azerbaijan and Morocco are current participants.
- DTEE is a collaboration between the ITF and the Wuppertal Institute, supported by the International Climate Initiative of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.
- The ITF is an inter-governmental organisation within the OECD (Organisation for Economic Co-operation and Development) system.
- It is the only global body with a mandate for all modes of transport.
- It acts as a think tank for transport policy issues and organises the annual global summit of transport ministers.
- India has been a member of ITF since 2008.

Forum for Decarbonising Transport

- NITI Aayog and World Resources Institute (WRI), India, jointly launched the 'Forum for Decarbonizing Transport' in India as part of the NDC-Transport Initiative for Asia (NDC-TIA).
- The NDC Transport Initiative for Asia (TIA 2020-2023) is a joint programme that will engage China, India, and Vietnam in promoting a comprehensive approach to decarbonizing transport in their respective countries.
- The project is part of the International Climate Initiative (IKI).
- NITI Aayog is the implementing partner for the India component of the project.
- The project aims at bringing down the peak level of GHG emissions (transport sector) in Asia (in line with a well below 2-degree pathway), resulting in problems like congestion and air pollution.

Tightening the Net

- Published by Oxfam International.
- It has said that announcing Net Zero Carbon Targets may be a dangerous distraction from the priority of cutting carbon emissions.
- Many countries like New Zealand, UK, US, China and the European Union have set net-zero targets on greenhouse gas emissions to tackle climate change.
- The report emphasises that reducing emissions cannot be considered a substitute for cutting emissions.
- Oxfam International is a group of independent nongovernmental organisations formed in 1995.

Leaders Summit on Climate 2021

- It was convened by the US President virtually.
- 40 world leaders, including the Prime Minister of India, were invited.
- It will underscore the urgency – and the economic benefits – of stronger climate action.
- This summit is seen as a key milestone on the road to the United Nations Climate Change Conference, Conference of the Parties 26 (COP 26) in November 2021 in Glasgow, Scotland.

India-US Clean Energy Agenda 2030 Partnership

- It is a joint climate and clean energy initiative of India with the US.
- Through the Partnership, India and the United States are firmly committed to working together in achieving their ambitious climate and clean energy targets and to strengthening bilateral collaboration across climate and clean energy.
- Includes the Strategic Clean Energy Partnership and the Climate Action and Finance Mobilization Dialogue.

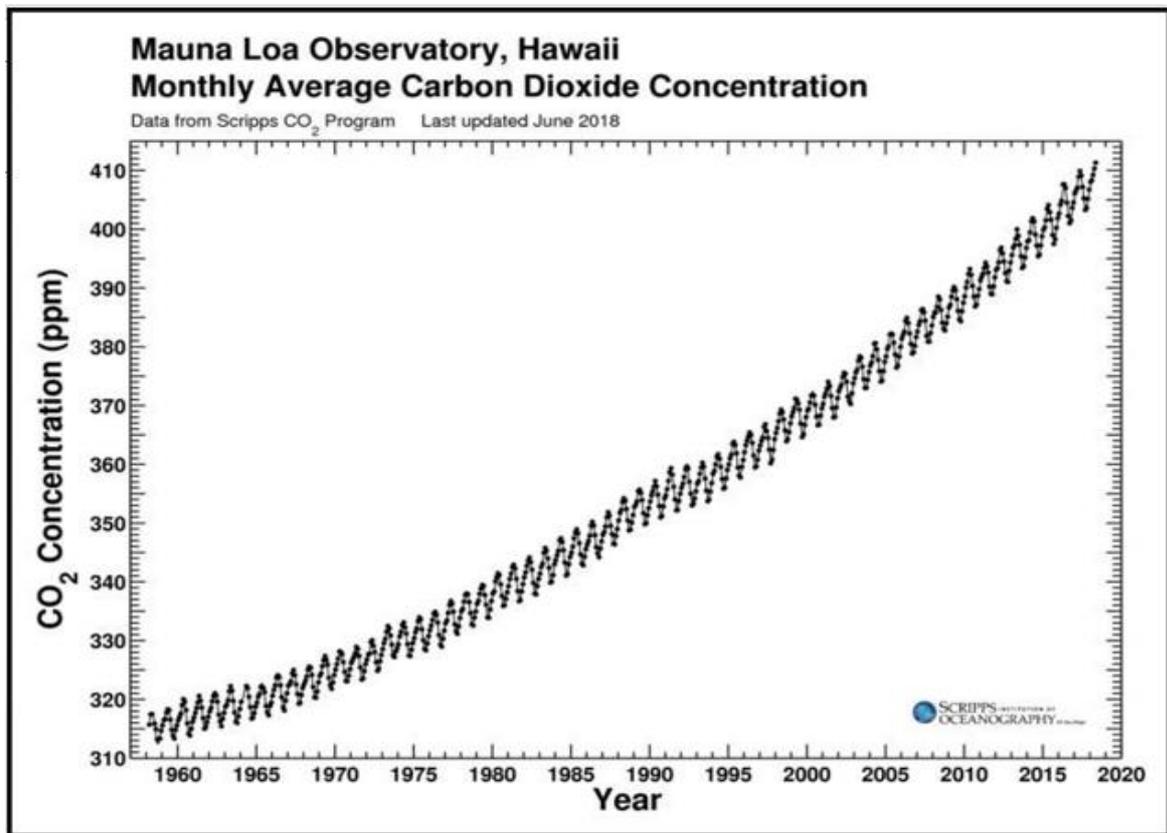
Leaf Coalition

- Lowering Emissions by Accelerating Forest Finance (LEAF) Coalition, a collective of the United States, United Kingdom and Norway governments, came up with a \$1 billion fund plan that shall be offered to countries committed to arrest the decline of their tropical forests by 2030.
- LEAF was supported by transnational corporations (TNCs) like Unilever plc, Amazon.com, Inc, Nestle, Airbnb, Inc as well as Emergent, a US-based non-profit.
- Tropical forests are massive carbon sinks and by investing in their protection, public and private players are likely to stock up on their carbon credits.
- The LEAF coalition initiative is a step towards concretising the aims and objectives of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) mechanism.
- REDD+ was created by the United Nations Framework Convention on Climate Change (UNFCCC).
- It monetised the value of carbon locked up in the tropical forests of most developing countries, thereby propelling these countries to help mitigate climate change.

Keeling Curve

- The Keeling Curve is a graph that represents the concentration of carbon dioxide (CO₂) in Earth's atmosphere since 1958.
- The Keeling Curve is named after its creator, Dr. Charles David Keeling.
- Keeling began studying atmospheric carbon dioxide in 1956 by taking air samples and measuring the amount of CO₂ they contained.

- He observed global CO₂ levels at Mauna Loa Observatory in Hawaii.
 - The air samples taken at night contained a higher concentration of CO₂ compared to samples taken during the day.
 - CO₂ levels are highest in the spring, when decomposing plant matter releases CO₂ into the air, and are lowest in autumn when plants stop taking in CO₂ for photosynthesis.
 - Global atmospheric CO₂ levels were rising nearly every year and he was able to attribute this rise to the use of fossil fuels.



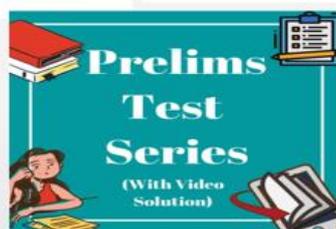
Network for Greening Financial System

- The Reserve Bank of India (RBI) has joined the Central Banks and Supervisors Network for Greening the Financial System (NGFS) as a Member.
- The NGFS is a group of Central banks and supervisors willing to share the best practices and contribute to the development of the environment and climate risk management in the financial sector, while mobilising mainstream finance to support the transition towards a sustainable economy.
- The System was launched at the Paris One Planet Summit on December 2017.

Extinction Rebellion

- The global movement Extinction Rebellion, also referred to as 'XR', describes itself as a decentralised, international and politically non-partisan movement using non-violent direct action and civil disobedience to persuade governments to act justly on the Climate and Ecological Emergency.
- XR was launched in the United Kingdom on October 31, 2018, as a response to a report by the United Nations Intergovernmental Panel on Climate Change (IPCC), which declared that "we only have 12 years to stop catastrophic climate change and our understanding that we have entered the 6th mass extinction event".
- The logo of Extinction Rebellion is an 'X' with the top and bottom crossed so that it resembles, according to the movement's website, an hourglass, which stands for a warning that time is running out for many species.
- The extinction (X) hourglass is placed within a circle that represents the planet Earth.
- The movement now has a presence in 75 countries, including India.
- The group has "three core demands" of governments around the world. It wants governments to "Tell the Truth", to "Act Now", and to "Go Beyond Politics" in order to confront the climate and ecological emergency that the world is faced with.
- It wants them to communicate the urgency to bring change, and reduce greenhouse gas emissions to net zero by 2025.
- XR seeks to "rebel", and asks groups to "self-organise", without the need for anyone's permission, to come up with collective action plans as long as they adhere to the group's core principles and values.

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