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1. **Greenhouse Gases At Record High**

Why in News?

The **World Meteorological Organisation (WMO)** has reported that the greenhouse gases in the atmosphere hit a new record in 2018.

- The greenhouse gases are rising faster than the average rise of the last decade and cementing increasingly damaging weather patterns.

The Greenhouse Gas Bulletin

- The report is an annual publication of the WMO.
- The Greenhouse Gas Bulletin is based on observations from the WMO Global Atmosphere Watch Programme, which tracks the atmospheric concentration of greenhouse gases.

Key Highlights

- The WMO **Greenhouse Gas Bulletin 2019** showed that globally averaged concentrations of carbon dioxide (CO_2) reached 407.8 parts per million (ppm) in 2018, up from 405.5 ppm in 2017.
- CO_2 remains in the atmosphere for centuries and in the oceans for even longer.
- Concentrations of **methane** and **nitrous oxide** also surged by higher amounts than during the past decade.
    - Methane (CH_4) is the second most important long-lived greenhouse gas.
        - Approximately 40% of methane is emitted into the atmosphere by natural sources (e.g., wetlands and termites), and about 60% comes from human activities like cattle breeding, rice agriculture, fossil fuel exploitation, landfills and biomass burning.
    - Nitrous oxide (N_20) plays an important role in the destruction of the stratospheric ozone layer which protects us from the harmful ultraviolet rays of the sun.
- Since 1990, there has been a 43% increase in **total radiative forcing** - the influence a given climatic factor has on the amount of insolation absorbed by the Earth - by long-lived greenhouse gases. CO_2 accounts for about 80% of this.
- **Reasons for increase in greenhouse gases:**
    - **Fossil fuel combustion** plays a dominant role in the increase of atmospheric carbon dioxide.
    - Activities like cattle breeding, rice agriculture, fossil fuel exploitation, landfills and biomass burning contributes about 60% of methane gas in the environment.
    - Oceans, soil, biomass burning, fertiliser use, and various industrial processes emit N_2O.

Impact of increasing greenhouse gases:

- **Global Warming**
  - Greenhouse gases surround the Earth like a blanket. As more greenhouse gases are released the blanket becomes excessively thick, dense, and less likely to allow heat to escape. Heat gets trapped inside the blanket of greenhouse gases and the Earth becomes too warm.
- **More extreme weather incidents**
  - The warmer climate will probably cause more heatwaves, more violent rainfall and also an increase in the number and/or severity of storms.
- **Rising Sea Level**
  - Sea level rises because of melting ice and snow and because of the thermal expansion of the sea (water expands when warmed). Areas that are just above sea level now, may become submerged.
- **Ocean acidification**
  - Ocean acidification results from an increased concentration of hydrogen ions and a reduction in carbonate ions due to the absorption of increased amounts of CO_2.
  - Ocean acidification, paired up with other climate impacts like warming waters, deoxygenation, melting ice, and coastal erosion, pose real threats to the survival of many marine species.

2. Increasing Emissions Gap

Why in News?

A **United Nations Environment Programme (UNEP)** report has also stated that there would have to be a 2.7% average annual cut in emissions from 2020 to 2030 for temperature rise to be contained at 2°C, while the more ambitious 1.5° C target would require a 7.6% reduction.

- The Paris Agreement of 2015 set a target of keeping global temperature rise this century well below 2° C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5° C.

UNEP Emissions Gap Report

- The report is published annually by UNEP (since 2010).
- This annual report from UNEP examines the progress of countries to close the gap via their commitments to emissions reduction, to ultimately stop climate change.
  - The Emissions Gap Report measures and projects three key trendlines:
    - The amount of greenhouse gas emissions every year up to 2030.

        - The commitments countries are making to reduce their emissions and the impact these commitments are likely to have on overall emission reduction.
        - The pace at which emissions must be reduced to reach an emission low that would limit temperature increase to 1.5° C, affordably.
- **Emissions Gap**
    - The Emissions Gap could also be called the "Commitment Gap". It measures the gap between what we need to do and what we are actually doing to tackle climate change. The gap is the difference between the low level of emissions that the world needs to drop to, compared with the projected level of emissions based on countries' current commitments to decarbonisation.

Why 1.5°C is important

- According to scientists 1.5°C level is associated with less devastating impacts than higher levels of global warming.
- Every fraction of additional warming beyond 1.5°C will result in increasingly severe and expensive impacts.
- Today we still have the chance to limit global temperatures to 1.5°C if emissions drop rapidly to 25 gigatons by 2030.
    - Overtime, emissions reductions targets will become increasingly steep, making it impossible to achieve 1.5°C target.
    - 10 years ago, if countries had acted on this science, governments would have needed to reduce emissions by 3.3% each year.
    - The world now needs a five-fold increase in collective current commitments.

Key Highlights

- GHG emissions continue to rise, despite scientific warnings and political commitments.
    - The world is on the brink of missing the opportunity to limit global warming to 1.5°C.
    - Even by relying only on the current climate commitments of the Paris Agreement, temperatures can be expected to rise to 3.2°C this century. Temperatures have already increased 1.1°C
- G20 members account for 78% of global GHG emissions. Collectively, they are on track to meet their limited 2020 Cancun Pledges.
    - Under the 2010 Cancun Agreements countries pledged to reduce emissions and set Nationally Determined Contributions (NDC), to be achieved by 2020.
    - India, according to the Emissions Gap Report, is projected to meet its unconditional NDC targets with current policies.

- Dramatic strengthening of the NDCs is needed in 2020. Countries must increase their NDC ambitions more than fivefold to achieve the 1.5°C goal.

3. Global Warming Alters Rainfall Pattern

Why in News?

A study by a team of Indian and U.S. researchers has found that global warming has altered a key weather system.

- This may be stimulating cyclones in the Bay of Bengal, decreasing winter rain in north India and altering global rainfall patterns.
- The change in the weather system has been attributed to changes in the Madden-Julian Oscillation (MJO).

Madden-Julian Oscillation (MJO)

- MJO is characterised by an eastward spread of large regions of enhanced and suppressed tropical rainfall, mainly observed over the Indian and Pacific Ocean.
- It is a moving band of rain clouds that travels around the globe spanning 12,000-20,000 km across the tropical oceans.
- In its journey, it interacts with surface waters of the Indo-Pacific ocean, the largest pool of warm water in the globe, and due to this the life cycle of the MJO gets affected.
- **Change in MJO:**
    - The MJO clouds on average are spending less days over the Indian Ocean and more days over the west Pacific.
    - It is this change in the residence time of MJO clouds that has altered the weather patterns across the globe.
- **Consequences of changes in MJO:**
    - The frequent California fires, droughts in Africa and East Asian floods and cyclones in the Bay of Bengal may be linked to these changes in global weather.
    - Increased the rainfall over northern Australia, west Pacific, Amazon basin, Southwest Africa and Southeast Asia (Indonesia, Philippines and Papua New Guinea).
    - Decline in rainfall over central Pacific, along the west and east coast of the U.S. (e.g., California), north India, east Africa and the Yangtze basin in China.
- **Impact on India:**
    - When the MJO appears in the Indian Ocean during the monsoon months of June-September, it can increase rains over India.
    - This year, India was poised to receive below normal monsoon rainfall in April but ended up with excessive rain partly due to the MJO.

- The change in the MJO could drift warmer surface water towards the Bay of Bengal and increase cyclones.

4. Sumatran Rhino

Why in News?

The Sumatran rhino has become extinct in **Malaysia** after the last remaining rhino died.

- It is one of the two countries where it is mostly found.
- There are now just 80 Sumatran rhinos left in the world, all of them in **Indonesia**, especially on the island of Sumatra and the Indonesian part of Borneo.

About Sumatran Rhino

- The Sumatran rhino is the **smallest of the five existing rhino species** in the world.
  - The other species include the White Rhino, the Black Rhino, the Greater One-Horned Rhinoceros and the Javan Rhino.
  - **Only the Great one-horned rhino is found in India**.
- Sumatran rhino once roamed across Asia as far as India, but its numbers have shrunk drastically due to deforestation and poaching.
  - In India the Sumatran Rhinos occurred in parts of Nagaland, Assam, Manipur, Tripura and Chittagong hills in the 19th century.
  - However, the last Sumatran Rhino of India was killed in 1967. The species is now **extinct in India.**
- IUCN's red list identifies the Sumatran and also the Black and Javan rhinoceros as being **critically endangered**.
- Both African (Black Rhino and White Rhino) and Sumatran rhinoceros have **two horns**, while **Indian and Javan rhinoceros have a single horn**.
- Rhinoceros are killed for their horns, which consist of keratin similar to human hair and nails and are used in traditional medicines in parts of Asia.

5. Ken-Betwa River Interlinking Project

Why in News?

- In a reply to a question in Rajya-Sabha the Central government has said that it is pushing Uttar Pradesh and Madhya Pradesh to make progress on the Ken-Betwa river interlinking project.

Ken-Betwa Interlinking Project

- The Ken-Betwa Link Project is the River interlinking project that aims to transfer surplus water from the Ken river in Madhya Pradesh to Betwa in Uttar Pradesh.

- It aims to irrigate the drought-prone Bundelkhand region spread across the districts of the two states:
    - Uttar Pradesh
        - Jhansi
        - Banda
        - Lalitpur
        - Mahoba
    - Madhya Pradesh
        - Tikamgarh
        - Panna
        - Chhatarpur

National River Linking Project

- It envisages the transfer of water from water 'surplus' basins where there is flooding to water 'deficit' basins where there is drought/scarcity, through inter-basin water transfer projects.
- It links rivers by a network of reservoirs and canals that will allow for their water capacities to be shared and redistributed.
- **Components of River Linking Projects**
    - Northern Himalayan Rivers interlink component.
    - A southern peninsular component.
    - An intra-State river linking component.

Need for Interlinking of Rivers

- Interlinking of rivers involves joining rivers by a network of canals and reservoirs that solve the twin problems of drought and flood by maintaining a water balance between the water deficit and surplus areas.

Advantages

- River linking will be a solution to recurring droughts in Bundelkhand region.
- It will provide employment during the execution of the project.
- It will lead to Ground water Recharging.
- It would create a path for aquatic ecosystems to migrate from one river to another, which in turn may support the livelihoods of people who rely on fisheries as their income.

Challenges

- The project passes through critical tiger habitat of panna tiger reserve, it is yet to get approval from National Green Tribunal.
- There is a huge economic cost attached with the projects implementation and maintenance, which has been rising due to delays in project implementation.
- Reconstruction and rehabilitation caused due to displacement of people resulting from submergence of two dams will involve social cost as well.

6. Atapaka Bird Sanctuary

Why in News?

- The Atapaka Bird Sanctuary in Kolleru Lake has become the lone safe breeding ground for the two migratory bird species - **Grey Pelicans and Painted Storks.**
- The Sanctuary is surrounded by an artificial pond which has a good vegetation cover supporting breeding for migratory birds.

Painted Storks

- **Habitat:** Found in Himalayan Ranges.
- **IUCN Status**: Near Threatened.

Grey Pelicans

- **Habitat:**Found in all continents except Antarctica.
- **IUCN Status**: Near Threatened.

Kolleru Lake

- It is located between the deltas of the Krishna and Godavari rivers in Andhra Pradesh.
- It forms the largest shallow freshwater lake in Asia.
- It is a wetland of international importance since 2002 under the Ramsar Convention.
- It was declared as a wildlife sanctuary in 1999 under India's Wildlife Protection Act of 1972.

7. New Snake Species found in Arunachal Pradesh

Why in News?

Researchers have discovered a new species of non-venomous burrowing snake in Arunachal Pradesh, named **Trachischium apteii**.

- It was found inside a thickly forested area of the **Talley Valley Wildlife Sanctuary** near the town of Ziro in **Arunachal Pradesh.**

Trachischium Apteii

- The newly discovered species belongs to a group of **fossorial snakes.**
    - They live mostly underground, and surface mainly during or after a heavy monsoon shower.
- Trachischium apteii was named in **honour of the contribution of Deepak Apte,** well-known marine biologist and Director of the Bombay Natural History Society (BNHS).
- Trachischium species are commonly called **slender snake.**
    - Currently known are seven species that are distributed across the Himalayas, and the Indo-Burma and Indo-China regions.

Talley Wildlife Sanctuary

- Talley Valley is both **wildlife sanctuary** and a **biodiversity hotspot** located at a distance of 32 kms from Ziro (Lower Subansiri district) towards the north east.
- Talley Valley Reserved Forest and Talle Wildlife sanctuary is situated at an elevated level with rivers like Pange, Sipu, Karing and Subansiri flowing through the Reserved Forest and Sanctuary.
- It comprises of sub-tropical and alpine forests and has a variety of flora and fauna, many of which are endangered.
- It is home to highly endangered species like **clouded leopard.**
- **Pleioblastus simone** is a bamboo variety **only found** in Talley Valley.

8. Assam Roofed Turtle

Why in News?

- The Assamese gamosa - traditional white cotton towel woven with turtle images is being promoted by a self-help group from Biswanath Ghat for the conservation of Assam Roofed Turtle (Pangshura sylhetensis).
- Biswanath Ghat is located on the northern banks of the Brahmaputra, which flows through **Kaziranga National Park**.Its high biodiversity led to the 401.5 sq km Biswanath Wildlife Division becoming a part of KNP.

Assam Roofed Turtle

- Freshwater Turtle
- **Protection Status**
  - **IUCN:** Endangered.
  - **CITES**: Appendix II.
  - **India's Wildlife Protection Act, 1972** : Protected under Schedule I.

Gamosa

- It is a traditional textile and representation of Assamese culture and is used on religious occasions, in weddings and gifted as a symbol of respect.
- It comes in different varieties like uka, phulam, bihuwan, tiyoni, pani, aanakota, dora boronor or jur and xadharon gamosa.

To Watch the Video on YouTube,
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