1. **Ramsar Sites:** Recently, India made a significant advancement in environmental sustainability by adding two more wetlands—**Khichan (Phalodi)** and **Menar (Udaipur)** in **Rajasthan**—to the prestigious list of Ramsar Sites.
    - With this addition, the **total number of Ramsar Sites** in the country has **risen to 91,** underscoring India's increasing commitment to the preservation of critical ecosystems.
    - **About Ramsar Sites:** A wetland designated as internationally important under the Ramsar Convention, also known as the 'Convention on Wetlands'.
    - **About Ramsar Convention :** It is the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources.
        - **Timeline**: The Convention was adopted in the **Iranian city of Ramsar in 1971** and came into force in 1975.
        - **Contracting Parties**: Almost 90% of UN member states have become "Contracting Parties" (172).
        - **Membership of India**: India is a part of the Ramsar Convention and signed in 1982.
        - **Criteria**: To be Ramsar site, however, it must meet at least one of the nine criteria defined by the Ramsar Convention of 1971, including :
            - ✓ Supporting vulnerable, endangered, or critically endangered species.
            - ✓ Hosting threatened ecological communities.
            - ✓ Regularly supporting 20,000 or more waterbirds.
            - ✓ Serving as a vital source of food for fish, or functioning as a spawning ground, nursery, or migration path essential for fish populations.
2. **International Institute of Administrative Sciences (IIAS) :** Recently, India was elected President of the International Institute of Administrative Sciences (IIAS) for the 2025–2028 term.
    - India secured 87 votes, defeating Austria with 54 votes. This is the first time in IIAS's 100-year history that the presidency was decided through a formal ballot.
    - **About IIAS :** A global federation headquartered in Brussels.
        - It comprises **31 member states**, **20 national sections**, and **15 academic research centres**.
        - Promotes **international cooperation in scientific research and innovation** in the field of public administration.

- While **not a formal UN body**, IIAS collaborates closely with UN entities such as: **Committee of Experts on Public Administration (CEPA)** & **UN Public Administration Network (UNPAN)**
- Member countries include **India, Japan, Germany, China, South Africa, Saudi Arabia, Indonesia, Mexico**, among others.
- India has been an active member since 1998, represented by the Department of Administrative Reforms and Public Grievances (DARPG).

3. **State of India's Environment in Figures 2025 Report** : Recently, the Centre for Science and Environment (CSE) released its annual State of India's Environment in Figures 2025 report, highlighting India's growing environmental and developmental crises.
   - The data reveals deepening challenges across climate, public health, agriculture, and human development sectors.
   - **Highlights From Report:** No state performs consistently well and air pollution reduces life expectancy significantly in major cities like Delhi and Lucknow.
     - 2024 was India's hottest year with extreme weather events causing 5.4 million internal displacements, mostly due to floods.
     - Greenhouse gas emissions hit 7.8% of the global share, with rapid growth between 2020-23.
   - **About CSE :** A **public interest research and advocacy organisation** based in New Delhi.
     - It focuses on promoting development that is both sustainable and equitable.
     - Established in 1980, serves as a think tank addressing environment and development issues in India.
     - The organisation researches about poor planning, climate change, and related challenges.
     - Advocates for policy reforms and improved implementation of existing environmental policies.
4. **Battery Energy Storage Systems (BESS) :** Recently, with climate change impacting energy security, Battery Energy Storage Systems have become crucial for India's transition to reliable and sustainable energy.
   - **About BESS:** Advanced electrochemical devices that store electricity chemically and release it when needed.



- They play a vital role in maintaining grid stability, optimizing energy use, and enabling large-scale renewable energy integration.

- **Types of BESS: Solid-State Batteries:** Emerging tech with higher energy density and improved safety.
  - **Flow Batteries:** Best for long-duration storage, offering greater stability and longer cycle life.
  - **Sodium-Sulphur (NaS) Batteries:** Designed for large grid-scale use with efficient heat management.
  - **Lead-Acid Batteries:** Affordable but less efficient, with a shorter lifespan.
  - **Lithium-Ion Batteries:** Most common due to high efficiency, rapid response, and long lifespan.

5. **Justice Hema Committee** : Recently, the Justice Hema Committee released a report investigating the reasons behind the Kerala Police dropping sexual assault cases within the Malayalam film industry.

- **About Justice Hema Committee :** In July 2017, the Kerala government established this Committee to investigate sexual harassment and gender discrimination in the Malayalam film industry.
  - The committee was headed by retired High Court Judge K Hema, along with former bureaucrat K B Valsalakumari and actor T Sarada.
  - This was the first state-level committee in India dedicated to addressing harassment issues within a regional film sector.
  - The Women in Cinema Collective (WCC)—a group of female actors, producers, directors, and technicians—called for a comprehensive inquiry and systemic reforms in the industry.

6. **Thermophiles Bacteria** : Recently, researchers at Vellore Institute of Technology discovered thermophilic bacteria from Rajgir Hot Spring, Bihar, showing promising antibacterial activity.
   - This highlights India's hot springs as largely unexplored reservoirs of antibiotic-producing bacteria.

- **About Thermophilic Bacteria**: Heat-loving microorganisms that thrive at temperatures between 45°C and 70°C, where most other life forms cannot survive.

- Produce enzymes that remain active at high temperatures, used in industries like PCR testing and biofuel production.
- Have special fats in their membranes that resist melting, ensuring stability in extreme heat.
- Utilize unusual nutrients such as sulfur or iron, enabling survival in mineral-rich, low-competition environments.
- **Examples:** Thermus aquaticus (used in PCR), Actinobacteria (noted for antibiotic production), Sulfolobus acidocaldarius (found in acidic hot springs).

- **About Hot Springs**: A natural spring where water is heated geothermally by the Earth's interior. They offer a mineral-rich environment with low microbial competition.

7. Laboratory-Grown Diamonds(LGD) : Recently, the Gemological Institute of America (GIA), the global authority on gem grading, announced that it will stop using its traditional 4Cs grading system (Colour, Clarity, Cut, Carat Weight) for laboratory-grown diamonds.

- **About LGD:** Same chemical, physical, optical properties & crystal structure as natural diamonds.
- **Applications :** Widely used in industrial tools and machines due to their hardness and strength, ideal for cutting and drilling.
  - Pure synthetic diamonds serve in electronics as heat spreaders for laser diodes, laser arrays, and high-power transistors.
  - India produces over three million lab-grown diamonds annually, contributing 15% to global production.

8. Building-Integrated Photovoltaics (BIPV) : Recently, **Building-Integrated Photovoltaics (BIPV)** has gained attention as a viable and space-saving alternative to traditional solar panels.

- **About BIPV:** Integrates solar photovoltaic (PV) cells directly into building components—such as walls, roofs, windows, and railings—replacing conventional materials like glass or cladding.
  - These components **serve dual purposes**—generating solar power while maintaining the structural integrity and aesthetic appeal of the building.
  - Unlike rooftop solar systems that are installed on top of structures, **BIPV is embedded within the architecture itself from the design stage.**

- **BIPV Matters for India:** Make solar energy feasible for buildings lacking rooftop access—similar to Germany's success with balcony-integrated solar panels.
  - These panels lower electricity usage and indoor cooling demand by reducing heat entry, leading to substantial energy savings.
  - Electricity generated by BIPV is fed straight into the building's internal system, reducing reliance on grid power.

9. **Hysteresis:** Recently, a study warned that the Antarctic Ice Sheet may have crossed a critical **tipping point.**
   - Researchers confirmed **signs of hysteresis,** indicating that irreversible melting could continue even if global temperatures stabilise or decline.
- **About Hysteresis:** Refers to a system's inability to revert to its original state even after the external influence is reversed. This means the process (in this case melting) has entered an **input-output loop** and can **keep occuring independently.**
  - In the case of the Antarctic Ice Sheet, once a critical warming threshold is crossed, melting continues regardless of subsequent cooling.
  - This irreversible feedback loop poses long-term threats to global sea levels.
- **Climate Tipping Points:** According to IPCC, tipping points are 'critical thresholds in a system that, when exceeded, can lead to a significant change in the state of the system, often with an understanding that the **change is irreversible.'**
  - According to the Study, **five dangerous tipping points may already have been passed** due to the **1.1o C of global heating** caused by humanity to date. Ex – Greenland ice cap.
  - At 1.5o C, **five tipping points become possible**, including coral reefs.