

1. **PAHAL Scheme** : Recently, the government has strengthened LPG subsidy transfers by enhancing the **PAHAL scheme** through Aadhaar-based authentication, leading to the identification and blocking of over 4 crore fake LPG connections.
 - **About PAHAL Scheme** : Launched by the **Ministry of Petroleum and Natural Gas**, PAHAL is India's **Direct Benefit Transfer (DBT)** system for LPG subsidies.
 - Under this scheme, consumers pay the **market price** for LPG cylinders, and the **subsidy is directly transferred** to their linked bank accounts.
 - With coverage of over **17 crore LPG users**, it is the **world's largest cash transfer program**.
 - **Eligibility Criteria**: Must be a **registered LPG consumer**.
 - ✓ The **combined annual taxable income** of the consumer and spouse should be **below ₹10 lakh**, as per the **Income Tax Act, 1961**.
2. **Sea Stars** : Recently, after 12 years of extensive research, scientists have uncovered the cause of the devastating **sea star wasting disease** that has led to the death of over 5 billion sea stars along North America's Pacific coast since 2013.
 - **Key Findings**: The epidemic devastated more than 20 sea star species, with the **sunflower sea star (*Pycnopodia helianthoides*)** being hit the hardest.
 - **Symptoms**: White lesions, twisted limbs, and rapid disintegration of body tissue.
 - **Causal Agent**: The bacterium ***Vibrio pectenicida*** was identified as the cause of the epidemic.
 - **Detection Method**: The bacterium was present in high concentrations in the **coelomic fluid** (sea star's internal fluid) of infected individuals but absent in healthy ones.
 - **Ecological Disruption**: The collapse of predatory sea star populations allowed **sea urchins to proliferate**, leading to **destruction of kelp forests**, critical marine habitats.
3. **LEAP-1 Mission** : Recently, **Dhruva Space**, an emerging Indian space-tech startup, unveiled plans for its first commercial satellite mission, **LEAP-1**.
 - **About LEAP-1 Mission** : Stands for **Launch, Experiment, Analyze, Progress**.
 - It is Dhruva Space's **first commercial satellite mission**, launched aboard **SpaceX's Falcon 9**.
 - The mission carries **international payloads** focused on **AI and Earth observation**.
 - Developed in collaboration with **Akula Tech** and **Esper Satellites** (both Australia)

- **Objectives:** Demonstrate **real-time geospatial AI processing** in space.
 - ✓ Enable **affordable hosted payloads** for sectors like **defense, agriculture, and disaster management**.
 - ✓ Exhibit Dhruva's **P-30 satellite platform** for commercial applications.
- **Payloads:** **Nexus-01 (Akula Tech):** An AI/ML module with **onboard self-retraining capabilities**.
 - ✓ **OTR-2 (Esper Satellites):** A **hyperspectral imaging sensor** for high-resolution Earth observation.

4. Microplastic Pollution : Recently, surveys conducted by the Ministry of Earth Sciences (MoES), through the **National Centre for Coastal Research (NCCR)**, have revealed that abandoned fishing gear and riverine discharges are the major contributors to **microplastic pollution** along India's coasts.

- These studies spanned **19 transects along the west coast**, from **Porbandar (Gujarat) to Kanyakumari (Tamil Nadu)**, and **25 transects on the east coast**, from **Puri (Odisha) to Thoothukudi (Tamil Nadu)**.
- **About Microplastics** are tiny plastic fragments, typically **less than 5 mm** in size. They are **persistent in the environment, highly mobile, and difficult to remove** once released into nature
 - **Types : Primary Microplastics:** Intentionally manufactured small plastic particles. Found in products like **cosmetics**, or released from **synthetic textiles** (e.g., clothes, fishing nets) during use or washing. Enter the environment through **direct release**, such as spills during production, abrasion, or consumer use.
 - ✓ **Secondary Microplastics:** Formed when **larger plastic items** (e.g., bottles, bags) **break down** due to environmental exposure. Breakdown is caused by factors like **sunlight (UV radiation)** and **ocean wave action**.

5. Restitutionary Damages : Recently, the Supreme Court affirmed that Pollution Control Boards (PCBs) have the authority to impose **restitutionary damages**. The judgment clarified that under Section 33A of the **Water (Prevention and Control of Pollution) Act, 1974**, and Section 31A of the **Air (Prevention and Control of Pollution) Act, 1981**, PCBs are empowered to:

- Levy fixed monetary penalties for environmental degradation, and
- Demand bank guarantees as precautionary measures to avert potential environmental harm.
- **About Restitutionary Damages:** Financial compensations or guarantees required from polluters to either restore damaged ecosystems or prevent potential environmental harm, even before any actual damage occurs.
 - **Objective:** To restore air, water, and ecosystems to their original state, focusing not just on penalizing polluters but on promoting ecological recovery and long-term sustainability.
 - Grounded in the “Polluter Pays” principle and the Precautionary Principle.
 - Reinforces constitutional duties:
 - ✓ **Article 48A:** Obligation of the State to protect and improve the environment.
 - ✓ **Article 51A(g):** Fundamental duty of every citizen to protect and improve the natural environment.

6. **District Flood Severity Index (DFSI):** Recently, researchers from IIT Delhi and IIT Gandhinagar introduced a **District Flood Severity Index (DFSI)**, which assesses the severity of floods using a range of indicators.

- **About DFSI:** Evaluates the historical severity of floods in Indian districts based on population impact, geographic spread, and flood duration.
 - Based on the **India Flood Inventory with Impacts (IFI-Impacts)** database.
 - **Parameters Used in DFSI:** Mean duration (in days) of all flooding events in a district.
 - ✓ **Percentage of area** historically affected by floods.
 - ✓ **Total number of deaths and injuries** caused by floods.
 - ✓ **Population size** of the district.

7. **India and Philippines Joint Sail And Naval Exercise :** Recently, India and the Philippines conducted their first-ever joint sail and naval exercises in the disputed South China Sea.

- **About Exercise : Purpose:** To enhance maritime cooperation and interoperability between the two navies (Duration: **Two days**)
 - To reinforce **freedom of navigation** in disputed waters.
 - **Location:** Within the **Philippine Exclusive Economic Zone (EEZ)** in the **South China Sea**.
 - **Indian Naval Assets Involved:** **INS Delhi** – Guided missile destroyer

- ✓ **INS Shakti** – Fleet replenishment tanker
- ✓ **INS Kiltan** – Anti-submarine warfare corvette
- **Strategic Significance:** A symbolic move against China's "Nine-Dash Line" claims.
- ✓ Supports India's **Act East Policy** and maritime cooperation through the "Necklace of Diamonds" strategy.
- ✓ Strengthens **defence diplomacy** and **freedom of navigation operations (FONOPs)**.

8. Biochar : Recently, India has turned its focus to carbon removal technologies such as **biochar**, recognising their potential in addressing climate challenges. This shift comes as the country prepares to launch its **national carbon market in 2026**.

- **About Biochar:** A carbon-rich, granular charcoal produced by pyrolysis (heating organic material in low-oxygen conditions). Made from agricultural residues and organic municipal solid waste. Produced at 400–600°C in kiln-like structures.
- **Key Benefits:** Acts as a **long-term carbon sink** (stores carbon in soil for 100–1,000 years).
 - ✓ **Improves soil health** and fertility.
 - ✓ **Manages organic waste** sustainably.
 - ✓ Produces valuable **byproducts**: bio-oil and syngas.
- India can convert **30–50%** of its agri and urban waste into 15–26 million tonnes of biochar, removing 0.1 gigatonnes of CO₂-equivalent annually.

9. Hepatitis D : Recently, the **World Health Organization (WHO)** and the **International Agency for Research on Cancer (IARC)** officially classified the **Hepatitis D virus (HDV)** as carcinogenic to humans. With this, HDV joins Hepatitis B and C as a major contributor to liver cancer.

- **About Hepatitis D :** A serious blood-borne viral infection that **depends entirely on the presence of the Hepatitis B virus (HBV) to replicate**. It cannot infect or multiply on its own and occurs in two forms: **Co-infection:** Simultaneous infection with both HBV and HDV.
 - **Superinfection:** HDV infects a person already chronically infected with HBV.
- **Common Symptoms** of Hepatitis D, often misdiagnosed, include fatigue, jaundice, nausea, abdominal pain, and dark-colored urine.
- **Transmission :** Through infected blood, unprotected sex, unsafe injections, and from mother to child during birth.

- **Why Is HDV Considered Cancer-Causing:**
 - **Aggravates HBV infection:** Increases the risk of liver cancer by **2 to 6 times** compared to HBV alone.
 - **Rapid liver damage:** Up to **75% of co-infected individuals develop cirrhosis** within 15 years, vs. ~50% in HBV-only cases.
 - **Faster progression:** Leads to **early onset of fibrosis and liver failure**, especially among younger patients.
 - **Mechanism:** HDV hijacks HBV's replication system, dramatically increasing viral load and oncogenic risk.

10. Rain Snake : Recently, a rare species of rain snake was discovered in the montane forests, marking a significant addition to biodiversity records.

- **About Rain Snake : Species Name:** Smithophis leptofasciatus, commonly known as the **narrow-banded rain snake**.
 - **Taxonomy:** A newly discovered species of rain snake belonging to the genus Smithophis.
 - **Etymology:** The name leptofasciatus comes from Greek and Latin, meaning "**narrow-banded**", referring to its unique dorsal pattern.
 - **Discovery Location:** Found in the **tropical montane forests of Mizoram, India**.
 - **Distinctive Features:** Narrow, incomplete **creamish-white or yellowish-lime transverse bands** on a shiny black body.
 - ✓ These markings distinguish it from other related species.
 - **Habitat:** Inhabits **humid, shaded microhabitats** near small streams.
 - ✓ Found at elevations between **900–1,200 meters** above sea level.
 - **Behavior:** **Semi-aquatic** and **nocturnal**.
 - ✓ Observed during the **monsoon season**.
 - **Genus Distribution:** This discovery increases the total number of known Smithophis species to **five**, all found in **northeastern India and surrounding regions**.
 - **Ecological Niche:** Known as **rain snakes** for their preference for **moist habitats**, typically near water bodies.

