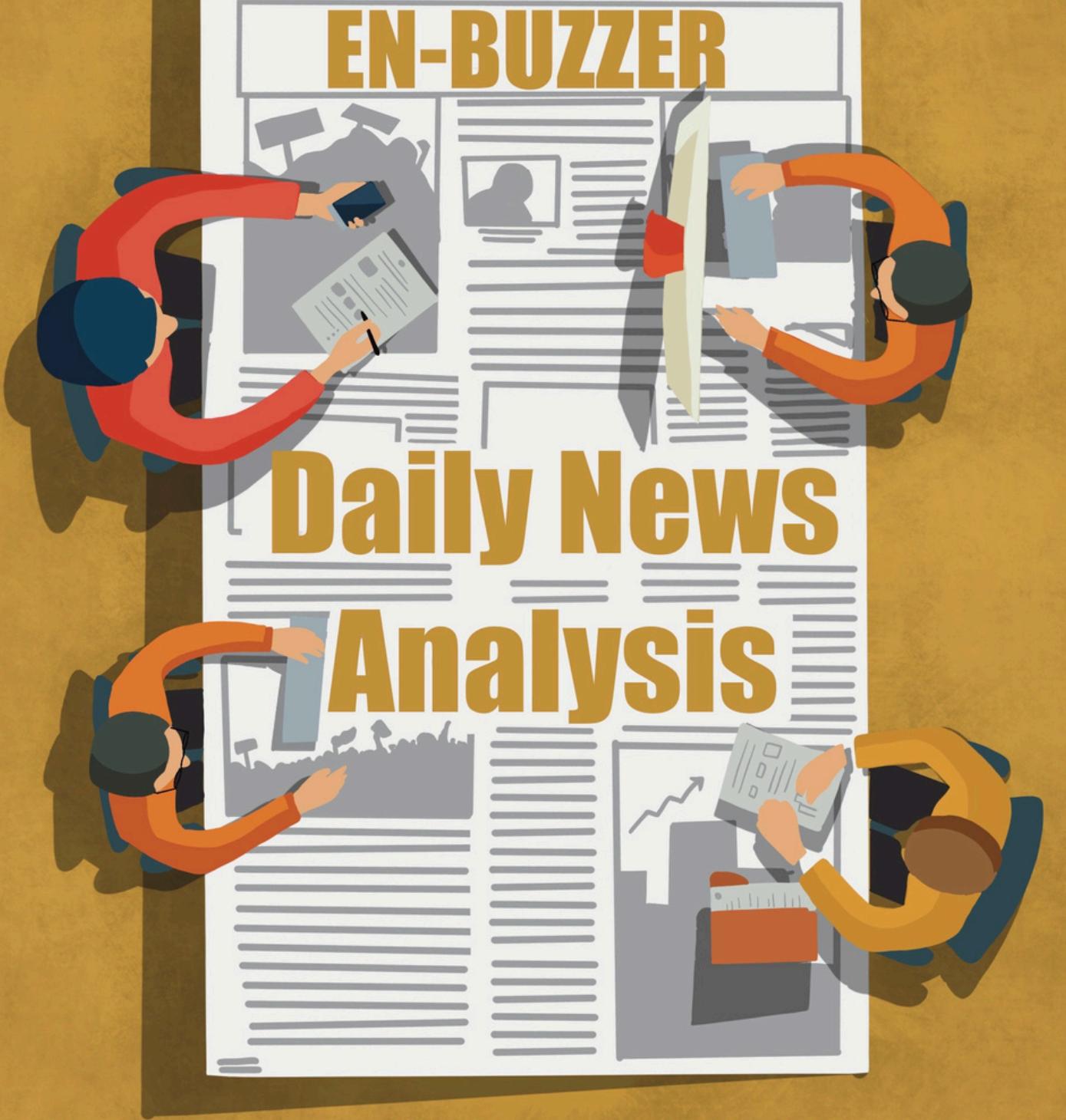




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**9 NOVEMBER 2025**

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**SUNDAY, 9th NOVEMBER 2025**

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## 1. NexCAR19 and CAR-T Cell Therapy

- **Prelims** - NexCAR19 and CAR-T Cell Therapy
- **Mains** - GS 3 - Science and Technology

### Why in the news?

- Prime Minister Narendra Modi launched the NexCAR19.

### NexCAR19

- **What is it?:** NexCAR19 is a **chimeric antigen receptor T-cell (CAR-T) therapy** developed in India for treating certain B-cell blood cancers.
- **Developed by:** The therapy is developed by ImmunoACT (an incubated company from IIT Bombay) in collaboration with hospitals such as Tata Memorial Centre.
- **How it works:** It specifically targets the CD19 protein on B-cell cancers to reprogramme the patient's own T-cells to attack the cancer cells.
- **Significance:**
  - It is India's **first indigenous CAR-T cell therapy**, marking a major milestone in biotech & health innovation in India.
  - It can reduce the cost and improve accessibility to patients as against the costly traditional CAR-T Cell therapy.

### CAR-T Cell Therapy

- **What is it?:**
  - CAR stands for Chimeric Antigen Receptor.
  - It modifies the body's immune T-cells, transforming them into powerful cancer-fighting cells called CAR-T cells.
- **Working Mechanism:**
  - This therapy involves extracting T cells (immune system cells) from a patient's blood.
  - The T cells are then genetically modified in a lab to create CARs on their surface.
  - CARs act like GPS, helping T cells recognize and target specific proteins in cancer cells.
  - The modified CAR-T cells are then re-infused into the patient's bloodstream.

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→ These CAR-T cells then attack and destroy the cancer cells with enhanced effectiveness.

- **Advantages of CAR-T Cell Therapy:**

- **Targeted Therapy:** CAR T cells can specifically target cancer cells while minimizing harm to healthy tissues.
- **Potent Effect:** CAR T cells can produce a dramatic and long-lasting response in some patients.
- **Personalized Therapy:** The treatment is customized for each patient using their own T cells.

- **Disadvantages**

- **High Cost:** CAR-T cell therapy is a complex and expensive treatment.
- **Side Effects:** CAR T cell therapy can cause serious side effects, including cytokine release syndrome (CRS) and neurologic problems.
- **Limited Availability:** CAR-T cell therapy is still a relatively new treatment and is not yet widely available.
- **Not Effective for All Cancers:** CAR-T cell therapy is currently most effective for certain types of blood cancers, such as leukemia and lymphoma.



## 2. UN Water Convention

- **Prelims** - UN Water Convention
- **Mains** - GS 2 - International Relations

### Why in the news?

- Bangladesh joined the UN Water Convention, making it the first South Asian Country to accede to the framework.

### UN Water Convention

- **Adoption:** Adopted in 1992 at Helsinki (Finland) under the framework of the United Nations Economic Commission for Europe (UNECE) and entered into force in 1996.
- **Objectives:**
  - To promote sustainable management, protection, and reasonable use of transboundary rivers, lakes, and groundwater.
  - To prevent, control, and reduce transboundary impacts (e.g., pollution, overuse, ecosystem damage).
  - To foster international cooperation for equitable sharing of water resources.
- **Features:**
  - Initially regional in scope (UNECE countries), but amended in 2003 to allow global accession (open to all UN member states from 2016 onward).
  - It complements the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (UN Watercourses Convention).
- **Key Provisions:**
  - Equitable and reasonable utilization by all riparian states.
  - Prevention of transboundary harm
  - Prior notification and consultation before implementing projects likely to have transboundary impact.
  - Cooperation through joint bodies for monitoring, data exchange, and conflict resolution.
  - Public participation and access to information
  - Integrated Water Resources Management (IWRM) including basin-wide and ecosystem-based approaches.

- **Global Significance:**

- A legal framework for more than 150 transboundary river and lake basins globally.
- Enhances cooperation among riparian states to prevent conflicts and promote shared benefits.
- Helps implement SDG 6.5- “implement integrated water resources management, including transboundary cooperation”.
- Supports climate resilience, as shared basins are critical for adaptation and disaster risk reduction.

- **India's Stance:**

- India is **not a party** to the UN Water Convention.
- Concerns relate to possible internationalization of bilateral river issues and potential constraints on India's existing treaties like the Indus Waters Treaty.
- India prefers bilateral and regional arrangements for transboundary water management instead of multilateral conventions.

### 3. Khangchendzonga National Park

- **Prelims** - Khangchendzonga National Park
- **Mains** - GS 3 - Environment

#### Why in the news?

- The International Union for Conservation of Nature (IUCN) recently rated Khangchendzonga National Park as “good” in its latest global review of natural World Heritage sites.

#### Khangchendzonga National Park

- **Location:** Sikkim ( Sikkim–Nepal border)
- **Geography**
  - ➔ Named after Mt. Khangchendzonga, the third-highest peak in the world (8,586 m).
  - ➔ Major glacier in the region is Zemu Glacier (one of Asia’s largest).
- **Ecological Significance**
  - ➔ Forms part of the Himalaya Global Biodiversity Hotspot.
  - ➔ Part of the Khangchendzonga Biosphere Reserve (KBR).
  - ➔ India’s first “Mixed” World Heritage Site (2016) — recognized for natural and cultural values.
- **Vegetation:** Altitudinal vegetation gradient: subtropical → temperate → alpine → tundra.
- **Major Fauna:** Snow leopard, red panda, Tibetan wolf, Himalayan tahr, blue sheep, mainland serow.

## 4. Changthang Cold Desert Sanctuary and Karakoram Wildlife Sanctuary

- **Prelims** - Changthang Cold Desert Sanctuary and Karakoram Wildlife Sanctuary
- **Mains** - GS 3 - Environment

### Why in the news?

- Multiple key defence infrastructure projects have been sanctioned within the Changthang Cold Desert and Karakoram (Nubra–Shayok) Wildlife Sanctuaries in Ladakh.

#### Changthang Cold Desert Sanctuary

- **Location:** Ladakh(Union Territory), in the Changthang Plateau.
- **Features:**
  - Altitude: Lies at an altitude of 4,000–9,000 m (one of world highest wildlife sanctuaries)
  - Associated Wetlands: Tso Moriri, Tso Kar, and Pangong Tso lakes.
- **Biodiversity:**
  - Represents **Trans-Himalayan biogeographic zone**.
  - **Major Fauna:** Mammals like , snow leopard, Tibetan argali (Nyan), Tibetan gazelle, woolly hare, Tibetan wolf.
  - **Flora:** Cold-arid shrubs and grasses like Caragana, Artemisia, and Kobresia
- **Pastoral Community:** Changpa Tribe

#### Karakoram Wildlife Sanctuary

- **Location:**
  - Ladakh, near the Siachen Glacier and Karakoram Range.
  - Lies north of the Nubra Valley and contiguous with Central Karakoram National Park (Pakistan) across the LoC.
- **Geography**
  - **Altitude:** 3,500–7,000 m (One of India's northernmost protected areas)
  - **Associated Mountain Range:** Karakoram Range.
  - **Associated Rivers:** Source region for major rivers (e.g., Shyok, Nubra).
- **Biodiversity:**
  - **Flora:** Sparse alpine vegetation.
  - **Fauna:** Mammals like Snow leopard, Tibetan wolf, Himalayan brown bear, Eurasian lynx, blue sheep (bharal), Asiatic ibex as well as Birds like Himalayan snowcock, golden eagle, lammergeier.

## 5. Peru

- **Prelims** - Location of Peru
- **Mains** - GS 2 - International Relations

**Peru**

**Why in the news?**

- The 9th round of India-Peru trade agreement was successfully concluded in Peru.

**Peru**

- **Location:** Peru is a country in western South America.
- **Capital:** Lima
- **Bordering Countries:** Ecuador, Colombia, Brazil, Bolivia, Chile.
- **Bordering Waterbodies:** Pacific Ocean.
- **Associated Geographical Features -**
  - Andes mountains passes through Peru.
  - Tropical Amazon rainforest with the Amazon River.
  - Ocean Currents in the region - Humboldt (cold) and El Niño (warm).
- **Economy**
  - The country was the second world producer of copper, silver and zinc, eighth world producer of gold



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## 6. Deep Sea Fishing

- **Prelims** - Deep Sea Fishing
- **Mains** - GS 3 - Economy

### Why in the news?

- The Union Government notified the rules for 'Sustainable Harnessing of Fisheries in the Exclusive Economic Zone (EEZ)' to give priority to fishermen cooperative societies and fish farmer producer organisations (FFPOs) for undertaking deep-sea fishing operations and managing technologically advanced vessels.

### Deep Sea Fishing

- **Definition:** Deep sea fishing is the practice of catching fish and other marine species from deep ocean waters, usually beyond 12 nautical miles from the coast, extending up to 200 nautical miles (EEZ).
- **Objectives**
  - To harness untapped marine resources in offshore waters.
  - To reduce overfishing pressure in coastal zones.
  - To boost export earnings and fishers' income.
  - To align with India's Blue Economy goals.
- **Focus Species:** Tuna, swordfish, mackerel, sardines, shrimps, squids, anchovies, deep-water lobsters, etc.
- **Features**
  - Conducted using mechanized vessels (trawlers, longliners, purse seiners).
  - Vessels have on-board freezing, sonar, and navigation systems.
  - Fishing grounds lie beyond 12 nautical miles in the EEZ.
- **Importance**
  - Enhances food and nutritional security.
  - Generates employment and exports.
  - Aids in balanced use of marine resources.
  - Supports India's SAGAR vision and Blue Economy framework.
- **Challenges**
  - High investment costs and maintenance of vessels.
  - Lack of skilled manpower and training.



- Conflict between traditional coastal fishers and deep-sea trawlers.
- Environmental concerns like overfishing and bycatch.
- Inadequate port and storage facilities.

- **Government Initiatives**

- **Marine Fisheries Policy (2017)**: Encourages sustainable deep-sea fishing and modernization of the fleet.
- **Pradhan Mantri Matsya Sampada Yojana (PMMSY)**: Financial support for deep-sea vessels and marine infrastructure.
- **Blue Revolution Scheme**: Promotes advanced fishing technology and export-oriented marine production.
- **FIDF (Fisheries and Aquaculture Infrastructure Development Fund)**: Provides loans for deep-sea fishing vessels and cold chains.

- **Way Forward**

- Promote eco-friendly fishing practices and marine ecosystem protection.
- Strengthen monitoring, control, and surveillance systems (MCS).
- Encourage public-private partnerships and fisher cooperatives.
- Build marine research and skill development capacity.



## 7. Tropical Forests Forever Facility (TFFF)

- **Prelims** - Tropical Forests Forever Facility (TFFF)
- **Mains** - GS 3 - Environment

### Why in the news?

- At the Leaders' Summit in Belem, Brazil, where heads of state have converged ahead of the climate conference, India said it would join the Tropical Forest Forever Facility (TFFF) as an 'Observer'.

### Tropical Forests Forever Facility (TFFF)

- **Launched by:** Brazil at COP28 (Dubai, 2023).
- **Purpose:** Long-term, performance-based finance for tropical forest conservation and climate mitigation.
- **Nature:** A global endowment-style fund rewarding countries for maintaining intact tropical forests.
- **Objectives**
  - Incentivise forest-rich developing countries to preserve standing forests.
  - Compensate for global ecosystem services: carbon capture, biodiversity, rainfall regulation.
  - Directly benefit Indigenous Peoples and Local Communities (IPLCs).
  - Provide a predictable, perpetual financial mechanism for forest protection.
- **Features**
  - **Proposed Fund Size:** ~USD 125 billion.
  - **Annual Payouts:** Based on forest area conserved ( $\approx$  USD 4 per ha / year).
  - **Penalty:** Deductions for deforestation or degradation.
  - **Monitoring:** Satellite-based verification.
  - **Governance:** Multi-stakeholder; 20% funds earmarked for IPLCs.
  - **Financing Model:** Blended finance—public, private, and philanthropic sources.
- **Significance**
  - Promotes global climate justice.
  - Supports Paris Agreement and Kunming-Montreal Biodiversity Framework goals.

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- Shifts from “avoiding deforestation” (REDD+) to rewarding preservation.
- Encourages Blue & Green Economy approaches.

- **Challenges**

- Mobilising massive funding.
- Ensuring fair distribution and transparency.
- Coordination with existing mechanisms (e.g., REDD+, GCF).
- Possible perverse incentives or dependency risks.