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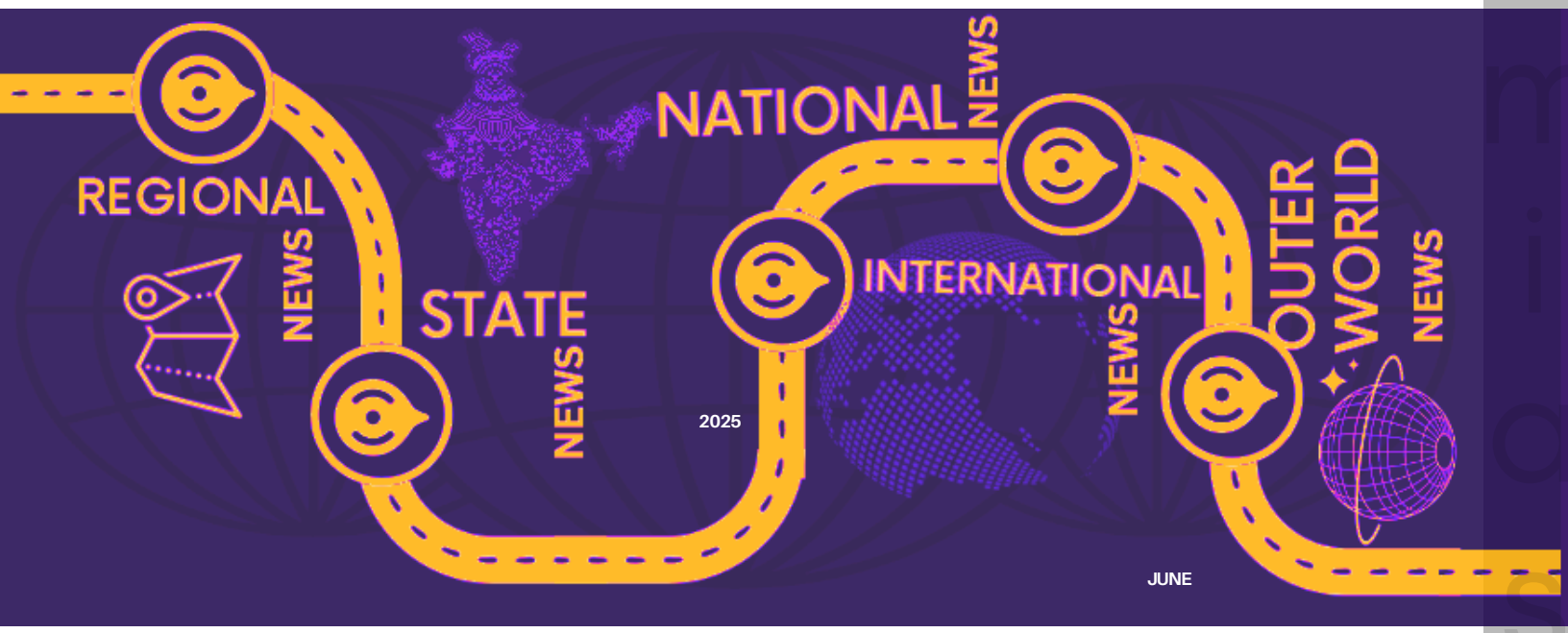

MUST READ!

- Digital Reforms in Gram Panchayats
- UPSC At 100: Guardian of Meritocracy and Nation-Building
- H-1b Visa Fee Hike and Its Implications
- Foodgrain Storage System in India
- Clean Slate Doctrine Under the Insolvency and Bankruptcy Code (IBC)
- Cold Desert Biosphere Reserve (CDBR)
- Carbon Capture, Usage and Storage (CCUS) In Asia and India
- India's Disaster Risk Reduction (DRR): Towards A Resilient Nation
- Universal Immunisation Programme (UIP) In India
- RBI's Updated Rangarajan Poverty Line

SPECIAL COLUMNS

- CASTE CENSUS - (S-E-E-E-P-C) SURVEY, TELANGANA, 2024–25
- DEVELOPMENT PROJECTS IN ANDHRA PRADESH

November 2025

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PREFACE

Welcome to our monthly current affairs magazine! We are thrilled to provide you with the latest information and updates on the most important events that happened in our country and around the world in the month of November 2025. Our magazine is designed to help you prepare for competitive examinations like UPSC and other State PSC Exams, and we hope that you will find it informative, engaging, and useful.

In this magazine, you will find a wide range of topics covering current affairs, including politics, economics, sports, science and technology, and many more. Our team of writers and editors work hard to bring you the most accurate and up-to-date information, so you can stay informed and prepared for any competitive exam.

We understand that preparing for competitive exams can be a daunting task, but we are here to make it easier for you. Our magazine is designed to be easy to read and understand, with clear and concise articles that will help you stay on top of the latest news and events.

We believe that knowledge is power, and we are committed to helping you achieve your goals. Whether you are preparing for a government job, entrance exam, or any other competitive exam, our magazine will provide you with the information and insights you need to succeed.

Thank you for choosing our magazine, and we hope that you find it helpful and informative.

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ACKNOWLEDGMENTS

We extend our heartfelt gratitude and appreciation to the exceptional team of content developers who have played a pivotal role in shaping our UPSC Current Affairs Magazine. Your unwavering dedication, extensive research, and commitment to delivering high-quality content have been instrumental in making this publication a trusted resource for our readers.

Your relentless pursuit of current affairs, profound understanding of complex issues, and the ability to distil them into informative, concise, and engaging articles have set a benchmark in the field of competitive examination preparation.

We are proud to have a team that goes above and beyond, ensuring that our readers are well-informed and well-prepared for the UPSC examinations. Your exceptional contributions are the driving force behind our magazine's success.

Thank you for your hard work, expertise, and passion for delivering top-notch content. Your efforts have not only enriched our magazine but have also played a significant role in the educational journey of countless aspiring civil servants.

We look forward to continuing this remarkable journey of knowledge dissemination with your continued support and excellence.

With deep appreciation,

EKAM IAS ACADEMY

POLITY AND GOVERNANCE

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ECONOMY

HISTORY

GEOGRAPHY

ENVIRONMENT

SCIENCE AND TECHNOLOGY

SECURITY

SOCIETY

KNOW YOUR STATE

POLITY AND GOVERNANCE

RIGHT ISSUES

JUDICIAL RECOGNITION OF PERSONALITY RIGHTS

SOURCE: THE HINDU

Why in News?

The **Delhi High Court (2025)** granted interim protection to **Aishwarya Rai Bachchan, Abhishek Bachchan, and Karan Johar** against **unauthorised AI-generated use of their images, voices, and likenesses**, marking a significant judicial step in recognizing **personality rights in the digital ecosystem**.

About Personality Rights

- **Definition:** Personality rights safeguard a person's **distinct attributes—name, likeness, image, signature, and voice—from commercial or manipulative use** without consent.
- **Legal Foundation:** These rights stem from **Article 21** (dignity, privacy) and **Article 19(1)(a)** (expression).
- **Nature:** Not codified in a single law; derived from **common law principles** such as privacy, defamation, and passing off.
- **Scope:** Protects both **celebrities and ordinary citizens**, especially in cases of **AI-generated impersonation** or **deepfake exploitation**.

Statutory Anchors

1. **Copyright Act, 1957**
   - **Section 38A:** Grants performers exclusive economic rights.
   - **Section 38B:** Protects moral rights to prevent distortion or unauthorized adaptation of performances.
2. **Trade Marks Act, 1999**
   - Permits registration of **names, signatures, and catchphrases** as trademarks.
   - Celebrities such as **Amitabh Bachchan and Shah Rukh Khan** have trademarked their names.
3. **Passing Off under Section 27:**
   - Prevents misrepresentation implying **false endorsement** or **association**, protecting brand reputation.

Judicial Evolution of Personality Rights

- **Rajagopal v. State of Tamil Nadu (1994):** Recognized **autonomy over one's identity** as a privacy right.
- **Rajinikanth v. Varsha Productions (2015):** Held that **identifiability of a celebrity** itself establishes infringement.
- **Anil Kapoor v. Unknown (2023, Delhi HC):** Extended protection against **AI deepfakes and misuse** while clarifying that **satire and parody** remain part of free speech.
- **Jackie Shroff Case (2024):** Court restrained **AI chatbots** and **merchandise misuse** of his persona.
- **Arijit Singh Case (2024, Bombay HC):** First judicial protection against **voice cloning**, citing generative AI misuse.

Personality Rights vs Free Expression

Balancing **Article 21 and Article 19(1)(a)** remains complex.

- **DM Entertainment v. Baby Gift House (2010):** Warned against **overextension** of personality rights that may **curb free speech**.
- **Digital Collectibles v. GalactusFunware (2023):** Affirmed that **satire, parody, criticism, art, and news** are legitimate forms of expression. Courts thus stress **context-based balance** between **individual protection and creative freedom**.

Emerging Digital Challenges

1. **AI and Deepfakes:** Rapid AI tools generate **synthetic media** that can mimic faces or voices with alarming precision.
2. **Gendered Exploitation: Women and minors** face higher vulnerability to **non-consensual deepfake pornography**.
3. **Fragmented Legal Regime:** Absence of a **dedicated statute** results in inconsistent interpretation.
4. **Enforcement Gaps:** Tracking each instance of **AI-generated misuse** remains technologically and jurisdictionally complex.

Way Forward

- **Dedicated Personality Rights Law:** Introduce a **comprehensive legal framework** defining the scope, remedies, and permissible exceptions.
- **Defined Exceptions:** Protect **satire, parody, academic and artistic use** under fair expression.

- **Tech-Based Detection:** Develop AI-driven **monitoring systems** in collaboration with platforms for early identification of deepfakes.
- **Gender-Sensitive Approach:** Include **specific safeguards for women** and victims of image-based abuse.
- **Public Awareness:** Encourage individuals, influencers, and artists to **register their names, voices, and likeness** under IP laws.

Conclusion

The digital revolution has redefined **identity as data** and **expression as algorithmic content**. Judicial recognition of personality rights in India represents a **progressive fusion of privacy and dignity** in the age of AI. To ensure justice keeps pace with technology, India must evolve a **balanced, codified, and tech-enabled legal regime** that safeguards personal identity while upholding **creative and informational freedom**.

JUDICIARY

SUPREME COURT SAFEGUARDS LAWYER–CLIENT PRIVILEGE

SOURCE: THE HINDU

Why in News?

The **Supreme Court of India** recently upheld the sanctity of *lawyer-client confidentiality* under **Section 132 of the Bharatiya Sakshya Adhiniyam (BSA), 2023**, directing that *investigating agencies cannot summon advocates representing accused persons*, except under narrowly defined legal exceptions.

Background of the Case

- The case originated from an appeal against a **Gujarat High Court order** refusing to quash a police summons to an advocate involved in a loan dispute.
- The controversy deepened when agencies like the **Enforcement Directorate (ED)** began issuing summons to senior lawyers in cases concerning their clients.
- Even after the ED withdrew these notices, the Supreme Court took suo motu cognisance to lay down **uniform safeguards** protecting advocates from arbitrary action.

Judicial Observations

1. **Upholding Advocate-Client Privilege:**
   - The Court ruled that **details of a crime or FIR** cannot be sought from a lawyer who represents an accused.
   - Such demands show investigative failure rather than diligence.
   - This protection stems from **Section 132 of BSA**, mirroring **Article 20(3)** of the Constitution.
2. **Rebuke to the High Court:**
   - The Gujarat High Court's refusal to quash the summons was criticised as a **serious error**, amounting to abdication of its powers under Article 226.
3. **Warning to Investigators:**
   - The Court cautioned law-enforcement officers against **"impulsive transgressions"** into privileged communications.

Statutory and Legal Framework

- **Section 132, BSA 2023:** Protects confidential professional communications; privilege belongs to the client.
- **Sections 175 & 179, BNSS 2023:** Do not empower police to compel such disclosure.
- **Section 94, BNSS 2023:** Digital devices must be produced before a court, not seized arbitrarily.
- **Section 528, BNSS 2023:** Allows judicial scrutiny of such summons.
- **Section 134, BSA 2023:** Extends similar protection to in-house legal advisors.

Supreme Court's Directions

- **No direct summons:** Investigators cannot summon advocates for client details except under clearly stated exceptions.
- **Conditions for valid summons:**
  - Written justification citing the relevant exception under Section 132.
  - Approval of a senior officer (SP rank or above).
  - Subject to **judicial review** under Section 528 BNSS.
- **Handling of digital devices:**
  - To be produced before a **jurisdictional court** only.
  - Devices to be examined in presence of lawyer, client, and technical expert to protect other clients' data.
- **Scope:** Covers advocates in both **litigation and advisory** roles. In-house counsels remain protected under separate provisions.

Significance of the Judgment

- **Reinforces Constitutional Morality:** Upholds **Article 20(3)** and ensures that investigations remain constitutionally sound.
- **Protects the Legal Profession:** Recognises the **independence and dignity** of advocates as guardians of liberty.
- **Ensures Rule of Law:** Prevents misuse of coercive powers by investigative agencies and builds public faith in justice delivery.

Way Forward

1. **Training of Investigators:** Mandatory sensitisation on legal privilege and constitutional rights.
2. **Standard Operating Procedures:** Clear norms for digital evidence seizure and lawyer data protection.
3. **Bar Council Oversight:** Monitoring of misuse and proactive legal protection for practitioners.
4. **Legislative Clarity:** A detailed code defining exceptions to privilege can prevent misuse and confusion.

Conclusion

This Supreme Court ruling is a **landmark affirmation of legal ethics and individual liberty**.

It shields advocates from coercive misuse of power while ensuring fair investigation standards.

By fortifying **trust between lawyer and client**, the Court has strengthened both **constitutional due process** and **public confidence in the rule of law**.

POLICIES/SCHEMES/ACTS/REPORTS/ COMMITTEES IN NEWS

DIGITAL REFORMS IN GRAM PANCHAYATS

SOURCE: THE HINDU

Why in News?

The **Ministry of Panchayati Raj (MoPR)** has recently rolled out **new digital reforms** for Gram Panchayats in line with *Digital India* and *Atmanirbhar Bharat* to promote **transparent, efficient, and inclusive governance** in rural areas.

Key Digital Initiatives Related to Gram Panchayats

1. **SabhaSaar (2025)**
   - AI-based tool to generate **structured minutes** of Gram Sabha and Panchayat meetings.
   - Integrated with **Bhashini**, supports **14 Indian languages** for real-time, unbiased records.
2. **SVAMITVA Scheme**
   - Grants **legal ownership papers** for village households through drone mapping.
   - Facilitates **bank loans, asset utilization, and dispute resolution**.
   - As of Aug 2025, **2.63 crore property cards** issued across **1.73 lakh villages**.
3. **BharatNet**
   - Provides **broadband connectivity** to villages through Wi-Fi hotspots and FTTH.
   - Over **13 lakh FTTH connections** already active.
4. **eGramSwaraj**
   - A **comprehensive application** integrating Panchayat functions: planning, budgeting, accounting, asset management, online payments.
   - Used by **2.7 lakh Panchayati Raj Institutions** in 28 States and 6 UTs.
5. **Meri Panchayat App**
   - Mobile-based platform for **citizen engagement** and **transparency**.
   - Serves **25 lakh elected representatives** and nearly **95 crore rural citizens**.
6. **Panchayat NIRNAY**
   - Digitises **meeting notifications, agendas, and decision records**.
   - Replaces paper-based workflow with automated processes.
7. **Gram Manchitra**
   - A **GIS-based platform** showing village-level developmental works on digital maps.
   - Helps in planning, tracking assets, estimating costs, and aligning with **Gram Panchayat Development Plans (GPDPs)**.

How Digital Initiatives Enhance Panchayat Functioning

1. **Transparency in Governance**
   - Citizens can access Panchayat finances, decisions, and project updates online.

- AI-generated meeting minutes ensure **impartial and tamper-proof records**.

2. **Improved Administrative Productivity**
   - Automation reduces paperwork, allowing officials to focus on **implementation and problem-solving**.
   - Unified platforms prevent duplication and streamline fund flow tracking.
3. **Inclusivity**
   - **Bhashini-enabled tools** support multiple languages, increasing participation of diverse communities.
   - Apps like **Meri Panchayat** encourage **citizen oversight** and engagement.
4. **Digital Connectivity**
   - **BharatNet** enables access to e-health, e-education, and e-commerce, narrowing the rural-urban digital divide.
5. **Data-Driven Development**
   - **GIS mapping** ensures efficient **resource allocation**, correct site selection for infrastructure, and better monitoring of outcomes.

Challenges in Implementing Digital Reforms

1. **Infrastructure Deficit**
   - Slow internet, power cuts, and lack of digital hardware reduce functionality.
2. **Low Digital Literacy**
   - Many elected members lack basic IT skills.
   - Training is limited, leading to errors or **non-use of platforms**.
3. **Language and Cultural Barriers**
   - Regional dialects not fully supported.
   - **Resistance to change** due to reliance on traditional paper-based systems.
4. **Implementation Hurdles**
   - Tools like **Gram Manchitra** depend on accurate data—errors affect planning.
   - Overlapping systems create **extra workload** and confusion.
5. **Gender Digital Divide**
   - Women often have **limited mobile access and lower literacy**, restricting participation.

Way Forward

1. **Ensuring Reliable Access**
   - Strengthen **last-mile connectivity** via Wi-Fi hotspots, community kiosks, and solar-powered Panchayat offices.
2. **Capacity Building**
   - Introduce **Digital Sathis (trained local youth)** to guide Panchayat officials.
   - Use **vernacular video tutorials** for training.
3. **User-Friendly Platforms**
   - Create a **single login Digital Panchayat Dashboard** with icon-based, simple designs.
4. **Inclusive Participation**
   - Promote **women-led digital literacy centres** and SHG involvement.
   - Add **offline and voice-based services (IVR)** for low-literacy citizens.
5. **Support Framework**
   - Establish **24×7 Panchayat IT helpdesks** and real-time monitoring systems.
   - Focus on **quality of usage** instead of just adoption numbers.

Conclusion

Digital initiatives are revolutionising **rural governance** by enhancing efficiency, transparency, and citizen engagement. However, challenges of **infrastructure, digital literacy, and inclusivity** must be addressed. With reliable connectivity, continuous training, and user-friendly platforms, Gram Panchayats can become **true engines of grassroots digital democracy**, empowering rural India for the future.

PRIME MINISTER DHAN-DHAANYA KRISHI YOJANA (PMDDKY)

SOURCE: INDIAN EXPRESS

Why in News?

The **Government of India** has identified **100 Aspirational Agriculture Districts** under the newly launched **Prime Minister Dhan-Dhaanya Krishi Yojana (PMDDKY)** to enhance farm productivity, diversify crops, and improve rural prosperity through targeted agricultural interventions.

About the Scheme

- **Launched:** 2025 (Implementation from 2025–26 to 2030–31)
- **Nodal Ministry:** Ministry of Agriculture and Farmers' Welfare
- **Model:** Based on NITI Aayog's *Aspirational Districts Programme*, focusing exclusively on agriculture and allied sectors.
- **Financial Structure:**
  - No separate budget — integrates funds from **36 existing schemes across 11 ministries**.
  - **Total outlay:** ₹1.44 lakh crore for six years.

- Allocation: **40% subsidies**, **30% infrastructure**, **20% loans**, **10% training & market support**.

Objectives

1. **Enhance productivity** in agriculture and allied sectors.
2. **Promote crop diversification** to reduce mono-cropping and improve sustainability.
3. **Strengthen irrigation and storage infrastructure.**
4. **Support farmers**, especially **women and youth**, in agri-based entrepreneurship.
5. **Achieve self-reliance** in foodgrains, pulses, and oilseeds to cut import dependence.
6. **Promote sustainable practices** to address climate and water challenges.

Selection Criteria for Districts

- **Low Crop Yields:** Below the national productivity averages.
- **Limited Cropping Intensity:** Less than **1.55 cropping cycles per year**.
- **Poor Credit Access:** Less than **30% farmers** using institutional loans or Kisan Credit Cards.
- **Balanced Representation:** At least one district from every state and UT to ensure regional inclusiveness.

Implementation Mechanism

- A **District Dhan-Dhaanya Krishi Yojana (DDKY) Samiti**, chaired by the **District Collector**, will prepare and execute the **District Agriculture Development Plan (DADP)**.
- Each district will be guided by a **Central Nodal Officer** for monitoring and evaluation.
- The program emphasizes **convergence** between local governance, agricultural departments, and financial institutions.

Expected Outcomes

- Direct benefit to over **1.7 crore farmers**.
- Increased agricultural income through **modern techniques, better market access**, and **value addition**.
- Integration of **allied sectors** like dairy, fisheries, and poultry for diversified livelihoods.
- Strengthened **agri-infrastructure and digital monitoring** for real-time progress tracking.

Link with the Aspirational Districts Programme (ADP)

- PMDDKY draws inspiration from ADP's **"3C framework" — Convergence, Collaboration, and Competition.**
- Uses **data-driven governance**, including district-level dashboards to monitor agricultural indicators.
- Promotes **competitive federalism**, encouraging states to improve performance through measurable results.

Conclusion

The **PM Dhan-Dhaanya Krishi Yojana** is a forward-looking step toward **inclusive, data-driven agricultural transformation**. By converging existing resources and empowering districts, it aims to **bridge productivity gaps**, **boost rural incomes**, and **strengthen India's food security**. If implemented effectively, the scheme can become a **model for decentralized, farmer-centric development** in the coming decade.

ALTERNATIVE DISPUTE RESOLUTION (ADR) MECHANISM IN INDIA

SOURCE: INDIAN EXPRESS

Why in News?

Recently, the **Law and Justice Minister** highlighted the importance of **global cooperation** to strengthen **Alternative Dispute Resolution (ADR)** systems, referring to the ancient

"Panch Parmeshwar" doctrine that promotes collective decision-making and consensus-based justice.

What is ADR?

Alternative Dispute Resolution (ADR) refers to a range of processes that help parties resolve conflicts **without going to court**, emphasizing **voluntary participation, neutrality, confidentiality**, and **flexibility**.

Constitutional and Legal Framework

- **Article 39A** of the Constitution: Mandates **equal justice and free legal aid** to ensure access to justice for all.
- **Section 89 of the Code of Civil Procedure (CPC), 1908**: Legally recognizes **arbitration, mediation, conciliation**, and **Lok Adalats**.
- **Arbitration and Conciliation Act, 1996 (amended in 2021)**:
    - Based on **UNCITRAL Model Law**.
    - Sets up the **Indian Arbitration Council** for institutional arbitration.
    - Imposes a **180-day limit** for dispute resolution.
- **Legal Services Authorities Act, 1987**: Provides a statutory base for **Lok Adalats**.

Major Models of ADR

Method	Nature	Description
Arbitration	Binding	Neutral arbitrator gives a legally binding decision; popular in commercial disputes.
Mediation	Non-binding	A mediator helps parties reach a mutually acceptable solution; maintains relationships.
Conciliation	Semi-binding	Similar to mediation but conciliator actively suggests solutions.
Negotiation	Informal	Parties directly communicate to reach agreement; maximum flexibility.
Lok Adalat	Binding (final)	People's courts resolving minor civil, family, and compoundable criminal cases; no appeal lies.

Need for ADR in India

- **Judicial Backlog:** Over **4.57 crore pending cases**, with many stuck for decades.
- **Access to Justice:** ADR reduces costs, language barriers, and procedural delays.
- **Judicial Vacancies:** Around **33% in High Courts** and **21% in district courts** are vacant.
- **Economic Efficiency:** Encourages a stable business climate and investor confidence.
- **Global Standards:** Aligns with **UNCITRAL** norms and boosts India's reputation for fair dispute resolution.
- **Social Harmony:** Reduces adversarial tendencies and preserves social relationships.

Challenges in ADR (Mnemonic: DELAY)

- **D – Deficit of Infrastructure:** Lack of dedicated ADR centres and poor awareness at grassroots level.
- **E – Enforcement & Trust Deficit:** Delays in enforcing arbitral awards and perceived bias reduce credibility.
- **L – Legal Culture & Mindset:** Litigation is still viewed as the "real justice" route.
- **A – Absence of Quality Neutrals:** Shortage of trained mediators and arbitrators; inconsistent standards.
- **Y – Yielding to Procedural Complexity:** Arbitration often mimics court-like procedures, causing delay and costs.

Measures to Strengthen ADR (Mnemonic: CURES)

- **C – Create Infrastructure:** Establish **court-annexed mediation centres** and expand digital ADR platforms.
- **U – Upskill & Educate:** Include ADR training in law schools and organize awareness drives for the public.
- **R – Regulate & Reinforce:** Develop **uniform accreditation** for mediators/arbitrators and ensure **time-bound enforcement**.
- **E – Elevate Standards:** Strengthen institutions like the **India International Arbitration Centre (IIAC)** to ensure quality.
- **S – Streamline Processes:** Introduce **fast-track arbitration**, **online mediation**, and cost penalties for bad-faith participation.

Recent Reforms

- **Mediation Act, 2023:** Institutionalizes mediation as a pre-litigation step for civil and commercial disputes.

- **Online Dispute Resolution (ODR):** Promoted under **Digital India Mission** for low-cost, virtual settlements.
- **E-Lok Adalats:** During COVID-19, digital Lok Adalats resolved over **15 lakh cases**, proving scalability.

Conclusion

ADR is no longer an *alternative* but an **essential pillar of accessible justice**. By integrating **traditional wisdom (Panch Parmeshwar)** with modern mechanisms like **online mediation**, India can reduce judicial burden and enhance global investor confidence.

A **robust, inclusive, and technology-driven ADR ecosystem** is vital to achieve the constitutional goal of *"Justice for All."*

RIGHT TO INFORMATION (RTI) ACT, 2005 – 20 YEARS OF TRANSPARENCY

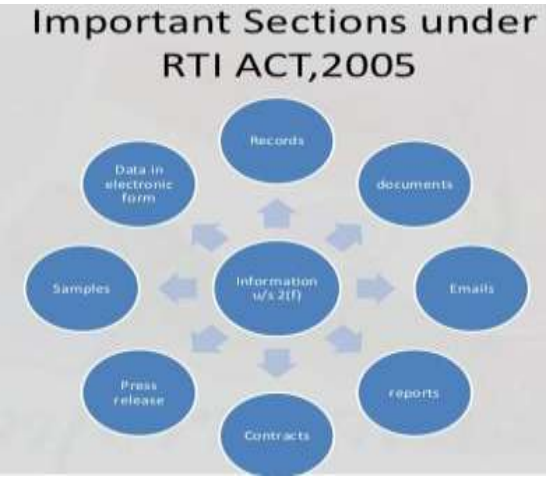
SOURCE: THE HINDU

Why in News?

October 2025 marks **two decades since the implementation of the RTI Act, 2005**, prompting a nationwide review of its performance. Recent findings reveal that India's transparency regime is facing **serious structural challenges**, including **crippling delays, vacant commissions, and legislative dilution**, raising concerns about the future of **citizen-led accountability**.

About Right to Information (RTI) Act, 2005

- The **Right to Information (RTI) Act, 2005** is one of India's most transformative democratic reforms, empowering citizens to demand information from public authorities.
- RTI has been instrumental in exposing corruption, improving delivery of welfare schemes, and deepening participatory democracy. Yet, 20 years later, the system faces institutional fatigue and executive resistance.



Salient Features and Core Provisions

1. **Universal Applicability:** The Act applies to all tiers of government — central, state, and local — including constitutional bodies, public sector undertakings, and even NGOs funded by the government.
2. **Citizen's Right:** Every citizen can request information from a Public Information Officer (PIO), who must respond within **30 days**.
3. **Overriding Authority (Section 22):** RTI overrides all other laws that restrict information sharing, including the **Official Secrets Act, 1923**.
4. **Public Interest Override (Section 8(2)):** Allows disclosure even of exempted information if it serves larger public interest.
5. **Institutional Mechanism:** Establishes **Central and State Information Commissions (CIC/SIC)** to hear appeals and complaints against information denial.
6. **First RTI Filed:** The first RTI under the Act was filed by **Shahid Raza Burney in Pune**, symbolising the beginning of India's information revolution.

Achievements Over Two Decades

1. **Enhanced Public Accountability:** RTI has helped citizens monitor welfare schemes like **MGNREGA, PDS, and PM Awas Yojana**, ensuring transparency in fund utilisation.
2. **Exposure of Corruption:** Landmark disclosures include the **Adarsh Housing Scam**, **2G Spectrum Case**, and **Commonwealth Games irregularities**, showing RTI's role in uncovering high-level corruption.
3. **Empowerment of Marginalised Groups:** Ordinary citizens, particularly rural women and social activists, have used RTI to demand fair wages, ration entitlements, and proper implementation of government schemes.
4. **Promotion of Transparency Culture:** The awareness that administrative decisions can be scrutinised by citizens has improved bureaucratic accountability.

Persistent Challenges

1. **Severe Backlogs and Delays:** Case pendency exceeds one year in most commissions; in **Telangana**, the backlog equals an estimated **29 years**, highlighting institutional collapse.
2. **Vacant Positions and Weak Infrastructure:** As of 2025, **Jharkhand and Himachal Pradesh commissions remain defunct**, while several others operate without Chief Information Commissioners.

3. **Erosion of Independence:** The **RTI (Amendment) Act, 2019** curtailed institutional autonomy by allowing the Central Government to decide commissioners' tenure and salary.
4. **Dilution via New Legislation:** The **Digital Personal Data Protection (DPDP) Act, 2023** amended Section 8(1), exempting personal information — even of public officials — thereby shrinking RTI's disclosure scope.
5. **Overuse of Security Exemptions:** Departments frequently deny information citing national security or the **Second Schedule exemptions** (e.g., RAW, IB, CERT-In).
6. **Threats to RTI Activists:** Over 100 RTI activists have faced violence or death for exposing corruption; yet, the **Whistleblower Protection Act, 2014** remains weakly implemented.

Reforms Needed

1. **Strengthen Information Commissions:**
   - Fill vacancies promptly through transparent and time-bound procedures.
   - Fix performance metrics to reduce pendency.
2. **Digital Integration:**
   - Use **AI chatbots** to assist citizens in drafting RTIs.
   - Adopt **blockchain and real-time tracking** for transparency and authenticity.
3. **Strict Enforcement of Section 4 (Proactive Disclosure):**
   - Mandate all departments to proactively disclose key data.
   - Penalise PIOs for unjustified delays or denials.
4. **Protect RTI Activists:**
   - Establish **district-level protection cells**, legal aid funds, and helplines.
   - Implement **anonymous complaint** mechanisms under the Whistleblower Act.
5. **Restore Autonomy:**
   - Introduce **parliamentary oversight** in commissioner appointments.
   - Ensure judicial review by Supreme Court/High Courts for accountability.

Conclusion

The RTI Act, **once hailed as a citizen's weapon against opacity, now faces systemic erosion**. Reviving its spirit requires institutional reforms, technological upgrades, and activist protection. Transparency must remain a constitutional commitment—not a procedural formality.

INSTITUTIONS IN NEWS

UPSC AT 100: GUARDIAN OF MERITOCRACY AND NATION-

SOURCE: THE HINDU

Why in News?

On **1 October 2025**, the **Union Public Service Commission (UPSC)** completed **100 years** since its establishment in 1926, celebrating its legacy as the **guardian of meritocracy** and impartial **civil service recruitment** in India.

Historical Evolution of UPSC

1. **Colonial Origins (1919–1926):**
   - The **Government of India Act, 1919** proposed an independent recruitment body.
   - Following the **Lee Commission (1924)**, the **Public Service Commission** was set up in 1926.
   - **Sir Ross Barker** became its first Chairman, ensuring a move away from pure British dominance.
2. **Federal Public Service Commission (1935):**
   - The **Government of India Act, 1935** gave the Commission a **federal character**, allowing Indians a greater role in administrative selection under colonial rule.
3. **Post-Independence Transition (1950):**
   - Articles **315–323 of the Constitution** established the **Union Public Service Commission** with **autonomy** and **constitutional status**.
   - It became the **guardian of impartial recruitment** for the Union and All-India Services.
4. **Present Role:**
   - UPSC conducts exams for **civil, engineering, medical, forest, defence, and statistical services**.
   - It has become the **backbone of India's governance structure**, upholding **credibility and trust** in public recruitment.

Core Principles of UPSC

1. **Meritocracy:**
   - Selection is based on **knowledge, skill, and performance**, removing privilege and patronage.
   - Example: **Ira Singhal**, 2014 topper, highlighted inclusivity by overcoming disability barriers.
2. **Fairness and Equal Access:**
   - Aspirants can write exams in **22 scheduled languages**, ensuring **linguistic justice**.
   - Representation spans across caste, class, gender, and region.
3. **Integrity and Neutrality:**
   - Ensures **confidentiality** of processes, anonymous evaluation, and independence from politics.
   - Evaluation across **48 subjects** is conducted in a neutral and uniform manner.
4. **Efficiency in Complexity:**
   - Handles **10–12 lakh prelim applicants annually** across **2,500+ centres**.
   - Conducts exams smoothly under strict **time schedules**.

Contributions to Nation-Building

1. **Administrative Continuity:**
   - UPSC-selected officers have steered India through **wars, reforms, natural disasters, and pandemics**, ensuring institutional resilience.
2. **Inclusivity in Governance:**
   - Over **60% of successful candidates** now come from **rural and semi-urban backgrounds** (DoPT data). Brings **diversity and representation** into governance.
3. **Professionalisation of Civil Services:**
   - Upholds **neutrality, probity, and efficiency** as guiding values of bureaucracy.
4. **Strengthening Federalism:**
   - By recruiting for **IAS, IPS, and IFoS**, UPSC balances Union–State relations through **All-India Services**.

Recent Reforms in UPSC

- **Technological Integration:** Use of **online applications, biometric and face-recognition tools** to curb impersonation.
- **PRATIBHA Setu:** Links interview-cleared candidates with **alternative career opportunities** to reduce talent waste.
- **AI-enabled Recruitment:** Plans to deploy **artificial intelligence** for screening and fraud detection.
- **Digital Inclusivity:** Better arrangements for **differently-abled candidates**, making exams more equitable.

Challenges Ahead

- **Changing Skill Demands:** Need for officers skilled in **AI, cybersecurity, data governance, climate change** and global affairs.
- **Equity Concerns: High coaching costs** and **urban bias** still limit a level playing field.
- **Exam Pressure:** With a **1:1000 success ratio**, aspirants face **financial, emotional, and social stress**.
- **Evolving Public Expectations:** Citizens now demand **fast, tech-enabled, transparent governance**, requiring updated skills.

Way Forward

- **Curricular Reforms:** Training should cover **digital governance, environment, global geopolitics, and innovation**.
- **Inclusive Support:** Provide **scholarships, rural outreach, and e-learning platforms** for equity.
- **Continuous Training:** Expand **Mid-Career Training Programmes (MCTPs)** for reskilling in emerging challenges.
- **Strengthening Ethics:** Deepen focus on **integrity, empathy, and accountability** in both exams and service training.

Conclusion

At **100 years**, the **UPSC** is more than an examination body – it is the **custodian of India's meritocracy**. By nurturing officers who are **competent, diverse, and ethical**, it has guided the nation through challenges and transitions. As India moves towards **Viksit Bharat 2047**, UPSC must **adapt to new realities while upholding its core values of fairness, integrity, and trust**.

PRELIMS POINTERS IN NEWS

KOYLA SHAKTI DASHBOARD AND CLAMP PORTAL

SOURCE: THE HINDU

Why in News?

The **Union Minister of Coal and Mines** recently launched the **KOYLA SHAKTI Dashboard** and the **CLAMP Portal** to enhance transparency and efficiency across India's coal ecosystem.

About KOYLA SHAKTI Dashboard

- Developed by the **Ministry of Coal**, this platform integrates the **entire coal value chain**—from mining to transportation and consumption—on one digital interface.
- It acts as the **digital backbone** for India's coal governance, enabling **real-time coordination** among coal producers, railways, ports, and end users.
- Data integration across agencies promotes **data-driven policy decisions** and faster operational planning.
- Stakeholders include **coal PSUs, ministries (Coal, Power, Railways, Ports), state mining departments,** and **industrial consumers**.
- The dashboard ensures **transparency, accountability,** and **efficiency** through live analytics, supporting the government's move toward **smart resource management**.

About CLAMP Portal

- The **CLAMP (Coal Land Acquisition, Management and Payment)** portal centralizes land records related to coal mining.
- It streamlines **land acquisition, compensation, and R&R (Rehabilitation & Resettlement)** processes, reducing procedural delays.
- The portal improves **inter-agency coordination** and enables **real-time monitoring** of land-related issues.

Conclusion

Both KOYLA SHAKTI and CLAMP represent a **digital transformation** in coal governance—moving from manual to integrated systems. These platforms strengthen **transparency, efficiency,** and **sustainability** in one of India's most crucial resource sectors.

REHABILITATION COUNCIL OF INDIA (RCI) REFORMS

SOURCE: INDIAN EXPRESS

Why in News?

The **Rehabilitation Council of India (RCI)** announced a set of reforms to improve **transparency, efficiency, and inclusivity** in rehabilitation and special education services across India.

About RCI

- **Statutory body (since 1993)** under the **Ministry of Social Justice and Empowerment**.
- Regulates and standardizes **training, certification, and professional standards** in rehabilitation and special education.
- Maintains the **Central Rehabilitation Register (CRR)** of qualified professionals and oversees **16 categories of training programmes**.

Key Reforms

- Aligns with **Jan Vishwas reforms** and **Ease of Doing Business** principles.
- **Fee waivers** for CRR issuance, renewal, and qualification updates to reduce barriers for professionals.

- **CRR validity extended to 7 years** with **automatic renewal** for professionals maintaining 100+ CRE (Continuing Rehabilitation Education) points.
- **144 top-performing institutions** designated as **Centres of Excellence** for innovation and quality training.
- Emphasis on **digital platforms** for certification, transparency, and record management.

Conclusion

The reforms mark a shift toward a **trust-based and technology-driven regulatory model** in rehabilitation education. They promote **ease of access, inclusivity,** and **quality assurance**—ensuring skilled manpower for the empowerment of persons with disabilities.

OPERATION HAECHI–VI

SOURCE: TIMES OF INDIA

Why in News?

The **Central Bureau of Investigation (CBI)** participated in **INTERPOL's Operation HAECHI–VI**, targeting **cyber-enabled financial crimes** across 40 nations.

About Operation

- Coordinated by **INTERPOL**, HAECHI–VI focuses on seven major types of cyber-financial crimes:
  - Voice phishing, investment and romance scams, sextortion, money laundering, and e-commerce fraud.
- The operation identified **45 suspects** and resulted in multiple arrests worldwide, including **8 in India**.
- Supported by **global law enforcement** — including INTERPOL, FBI, and German police — to dismantle cross-border cybercrime networks.
- Demonstrates India's **proactive stance in global digital security** and **financial crime prevention**.

Significance

- Strengthens **international cooperation** in combating cyber threats.
- Helps trace **illicit money flows** across jurisdictions through **digital forensic collaboration**.
- Reinforces India's commitment to **data security and transnational crime control** amid rising digitalization.

REVISED SCHEDULE M NORMS & ONDLS

SOURCE: THE HINDU

Why in News?

Eighteen Indian states are using the **Online National Drugs Licensing System (ONDLS)**, but none have fully complied with **Corrective and Preventive Action (CAPA)** under the **revised Schedule M norms** of 2023–24.

About Schedule M

- Part of the **Drugs and Cosmetics Act, 1940**, prescribing **Good Manufacturing Practices (GMPs)** for pharmaceuticals.
- **Revised in 2023** to align India's GMP standards with **WHO-GMP** and **PIC/S** guidelines.
- Applies to all **drug manufacturing units** for domestic and export markets; compliance due by **December 2025**.

Key Provisions

- Introduces **Pharmaceutical Quality System (PQS)**, **Quality Risk Management (QRM),** and **Product Quality Review (PQR)** mechanisms.
- Mandates **digital documentation**, **validated equipment**, and **computerized storage** to ensure traceability.
- Strengthens CAPA framework for **continuous quality improvement** and risk-based inspections.
- Promotes **online licensing (ONDLS)** to streamline regulatory processes and enhance transparency.

Significance

- Brings India's pharma manufacturing closer to **global quality benchmarks**.

- Ensures **consumer safety** and **export competitiveness** through system-based regulation.

Conclusion

The revised Schedule M represents a move from **compliance-based to performance-based regulation**. Its success depends on effective implementation by states, ensuring India's pharma sector remains **globally credible and quality-driven**.

SAHYOG PORTAL

SOURCE: PIB

Why in News?

The **Karnataka High Court** recently dismissed **X Corp's petition** challenging the Union Government's **Sahyog Portal**, which facilitates the lawful removal of online content under the IT Act.

About the Portal

- **Launched by:** Ministry of Home Affairs (MHA)
- **Maintained by:** Indian Cyber Crime Coordination Centre (**I4C**)
- **Legal Basis:** Section **79(3)(b)** of the **Information Technology Act, 2000**
- **Objective:** To create a secure, coordinated mechanism for **removing or disabling unlawful online content**.

Key Features

- Acts as a **centralized interface** between government agencies, intermediaries, and law enforcement.
- Facilitates **real-time coordination** for detecting and acting against **cybercrime and unlawful online activity**.
- Ensures **accountability and traceability** in issuing takedown notices under the IT Act.
- Integrates **65 intermediaries and 7 central agencies**, including major platforms like **Google, YouTube, Microsoft, and Amazon** (as of April 2025).
- Between **October 2024–April 2025**, **130 takedown notices** were issued through this system.

Purpose and Function

- Strengthens enforcement of **safe harbour provisions**, ensuring intermediaries remove illegal content upon receiving government notifications.
- Aims to promote **responsible digital governance** and prevent misuse of online platforms for unlawful activities.

Conclusion

The **Sahyog Portal** marks a decisive step in India's efforts to build a **coordinated, transparent, and accountable cyber ecosystem**. It enhances **inter-agency collaboration**, safeguards users, and ensures lawful digital conduct without compromising on due process.

SLAPP SUITS (STRATEGIC LITIGATION AGAINST PUBLIC PARTICIPATION)

SOURCE: THE HINDU

Why in News?

In **May 2024**, the **Supreme Court** of India cautioned lower courts against permitting **SLAPP suits**, emphasizing their potential to **stifle free speech and democratic debate**.

What are SLAPP Suits?

- **Definition:** Legal cases—commonly for **defamation or libel**—filed primarily to **intimidate or silence** critics rather than seek genuine legal redress.
- **Full Form:** *Strategic Lawsuit Against Public Participation*.
- **Typical Plaintiffs:** Corporations, politicians, or powerful individuals.

- **Targets:** Journalists, NGOs, activists, or citizens engaged in **public interest speech**.

Key Features

- **Intent:** To censor or deter criticism through **financial and psychological pressure**.
- **Impact:** Causes a **chilling effect** on public debate and investigative journalism.
- **Common Signs:** Inflated damages, vague legal claims, and **forum shopping** (choosing favorable courts).

Supreme Court's Stand

- The Court invoked the **Bonnard Principle**, stating that **injunctions** in defamation cases should be **rare and exceptional**.
- It laid down a **three-fold test** before granting injunctions:
  1. **Prima facie case** of defamation.
  2. **Balance of convenience** in favor of the plaintiff.
  3. **Irreparable harm** caused by publication.

JUDICIAL REFORMS AND CHALLENGES IN INDIA

Why in News?

The **Indian judiciary**, often regarded as the guardian of constitutional values, has come under scrutiny for **delays, mounting pendency, and opacity in appointments**. Recent developments like the **e-Courts Phase III Project (2023–2027)**, **Mediation Act 2023**, and **Supreme Court's live-streaming of hearings** mark transformative steps towards modernization. Yet, systemic issues continue to hinder justice delivery and developmental efficiency.

Key Advancements Transforming the Indian Judiciary

1. Digital Transformation through e-Courts Project

- The **e-Courts Mission Mode Project Phase III (2023–2027)** represents India's most ambitious legal digitization initiative.
- Funded with **₹7,210 crore**, it aims to establish **paperless, virtual, and interoperable court systems**.
- As of **October 2024**, virtual courts across **21 states and UTs** had handled **6 crore traffic challan cases**, collecting **₹649.81 crore in fines online**.
- This transformation promotes **speed, accessibility, and transparency**, reducing administrative burden and human errors.

2. Live Streaming of Constitutional Bench Hearings

- The **Supreme Court's decision to live-stream hearings** of constitutional importance democratizes access to justice.
- Framed under **Live Streaming Rules, 2022**, this initiative enhances **public trust and accountability**.
- Between **March 2020 and June 2024**, the Court conducted **over 7.5 lakh virtual hearings**, setting a **global benchmark for open justice**.

3. National Judicial Data Grid (NJDG) and Digital Access

- The NJDG provides **real-time case data**, improving transparency and enabling **data-driven judicial planning**.
- Covers **18,735 subordinate courts** and records **21.99 crore cases**.
- Establishment of **1,814 e-Sewa Kendras** ensures that even rural litigants can access digital services, bridging the digital divide.

4. Proactive Constitutional Jurisprudence

- The judiciary continues to act as the **sentinel of constitutional morality**, expanding rights under **Article 21**.
- Landmark verdicts like **Navtej Singh Johar (2018)** (decriminalization of Section 377), **Puttaswamy (2017)** (Right to Privacy), and **Common Cause (2018)** (Right to Die with Dignity) show the **judiciary's progressive role**.
- Judicial activism has upheld **gender equality, environmental rights, and personal liberty**, reinforcing constitutional guardianship.

5. Mainstreaming Alternative Dispute Resolution (ADR)

- ADR mechanisms—**mediation, arbitration, and Lok Adalats**—are crucial to reducing pendency.
- The **Mediation Act, 2023**, institutionalizes pre-litigation mediation and community dispute resolution.
- **Lok Adalats and Commercial Courts Act (2015)** have significantly cut down case inflow, offering **affordable, people-centric justice**.

6. Legislative and Executive Coordination

- The **Jan Vishwas (Amendment) Act, 2023** decriminalized **183 provisions across 42 Central laws**, reducing minor litigations.

- This shows a **collaborative approach** where executive and judiciary jointly aim to decongest courts and improve legal efficiency.

Major Challenges Confronting the Judiciary

1. Massive Case Backlog

- **Over 5 crore cases** remain pending, with the Supreme Court alone holding **88,417 cases (as of Sept 2025)**.
- Such delays erode the **right to speedy justice under Article 21** and perpetuate inequity—**76% of prisoners remain undertrial**.

2. Judicial Vacancies and Low Judge-Population Ratio

- With **25 High Courts** having a **30% vacancy rate** (345 posts empty), the strain is immense.
- Subordinate courts face nearly **5,000 vacant posts** out of 25,000 sanctioned, undermining access to justice.

3. Opaque Collegium and Appointment Process

- The **Collegium system** lacks transparency, fueling perceptions of **favoritism and "Uncle Judge" culture**.
- Women constitute only **14.27% of High Court judges (2025)**—reflecting serious diversity gaps.
- Absence of a **statutory disciplinary mechanism** weakens accountability.

4. Weak Infrastructure and Digital Divide

- The **Supreme Court's Centre for Research and Planning (2023)** reported a shortage of **4,200 courtrooms** nationwide.
- Poor connectivity and inadequate facilities hinder the **e-courts' potential**, especially in rural areas.

5. Government as the Largest Litigant

- The **government accounts for nearly 50% of all cases**, often pursuing avoidable appeals.
- This "**compulsive litigant**" behaviour clogs the justice system, wasting public resources.

Reform Measures to Strengthen the Judiciary

1. National Judicial Infrastructure Authority (NJIA)

- A statutory body to plan and maintain **uniform, modern judicial infrastructure**.
- Would ensure **digital parity, accessibility, and long-term funding**, depoliticizing court development.

2. Human Resource and Judicial Cadre Reforms

- Creation of **All India Judicial Service (AIJS)** for standardized recruitment.
- Regular **performance audits**, **continuous judicial education**, and a **transparent transfer policy** can enhance efficiency.

3. Transparent and Accountable Collegium System

- Publish **evaluation parameters and timelines** for appointments.
- A **restructured National Judicial Commission** with limited executive participation can ensure **checks and balance**.

4. Rationalized Case Flow Management

- Adoption of **AI-based case scheduling** and **differentiated case tracks** (fast-track, complex, regular).
- Periodic **case disposal audits** to maintain procedural efficiency.

5. Strengthening Pre-Litigation Mediation and Legal Aid

- Integrate **technology-enabled mediation** at district levels.
- **Legal literacy campaigns** and **community-level Nyaya Kendras** to reduce unnecessary filings.

6. Judicial Federalism and Decentralized Benches

- Establish **regional benches of the Supreme Court** and **circuit High Court benches** for equitable access.
- Decentralization will **decongest Delhi** and promote **regional justice delivery**.

7. Judicial Ethics and Accountability

- Adoption of a **Judicial Standards and Accountability Code** anchored in the **Bangalore Principles (2002)**—independence, integrity, impartiality, propriety, equality, competence, and diligence.
- Creation of a **Judicial Ethics Commission** for misconduct oversight without compromising autonomy.

Conclusion

India's judiciary stands at a crucial juncture—**balancing tradition with technology, autonomy with accountability, and speed with fairness**. Building a justice system that is **efficient, transparent, and inclusive** requires integrated reforms across all institutions. As the saying goes, **"A strong judiciary does not just deliver justice—it strengthens the soul of a democracy."**

INTERNATIONAL RELATIONS

INDIA AND ITS NEIGHBOURHOOD

INDIA-AFGHANISTAN RELATIONS

SOURCE: THE HINDU

Why in News?

Afghanistan's **Foreign Minister visited New Delhi**, marking the **highest-level Taliban interaction since 2021**, prompting India to **upgrade its Kabul technical mission to a full embassy**, without formally recognizing the Taliban government.

Core Elements of India's Engagement

- **Functional Diplomacy:** India maintains **full embassy operations in Kabul**, facilitating aid, development projects, and political dialogue.
- **Humanitarian Coordination:** Ensures delivery of **USD 3 billion+ investments** in infrastructure, healthcare, and education, including the **Salma Dam, Zaranj-Delaram highway, and Kabul Parliament**.
- **Strategic Security:** Taliban assurances to **prevent anti-India activities** enhance India's confidence in Afghanistan as a stable partner.
- **Economic Opportunities:** Access to Afghanistan's **mineral wealth (USD 1–3 trillion)** and connectivity via **Chabahar Port and TAPI pipeline** supports trade and energy security.
- **Regional Balance:** Engagement limits **Pakistan's influence** in Kabul and strengthens India's diplomatic footprint in Central and West Asia.

Challenges

1. **Security Risks:** Taliban's historic links with **LeT, JeM, and TTP** pose persistent threats.
2. **Pakistan's Influence:** ISI support to Taliban-aligned groups complicates India's regional strategy.
3. **Political Instability:** Taliban's **non-democratic governance, suppression of dissent, and violation of women's rights** contrast India's values-based engagement.
4. **Economic & Infrastructure Hurdles:** Poor governance, poverty, sanctions, and security issues challenge investments and project implementation.
5. **Drug Trafficking:** Afghanistan's opium production funds terrorism and fuels regional crises, affecting India's border states.

Steps to Strengthen India-Afghanistan Ties

- **Pragmatic Diplomacy:** Maintain full embassy, regular dialogue, and humanitarian support without formal recognition.
- **Counter-terrorism Cooperation:** Institutionalise intelligence sharing, joint operations, capacity building, and anti-narcotics collaboration in the **Golden Crescent**.
- **Economic Connectivity:** Expand trade and investment via **Chabahar Port**, air freight corridors, and resource-sector partnerships like **Hajigak mining**.
- **Multilateral & Regional Engagement:** Leverage forums like **Heart of Asia, SCO, Moscow Format, and UN** for coordinated aid and reconstruction.
- **Social and Human Rights Initiatives:** Promote **women's education, minority rights, vocational training, and cultural exchanges** to encourage inclusivity.

Conclusion

India's engagement balances strategic, economic, and humanitarian interests without formal recognition of the Taliban. Sustained diplomacy ensures India remains a key partner in Afghanistan's stability and regional connectivity.

INDIA'S RELATIONS WITH MAJOR POWERS

H-1B VISA FEE HIKE AND ITS IMPLICATIONS

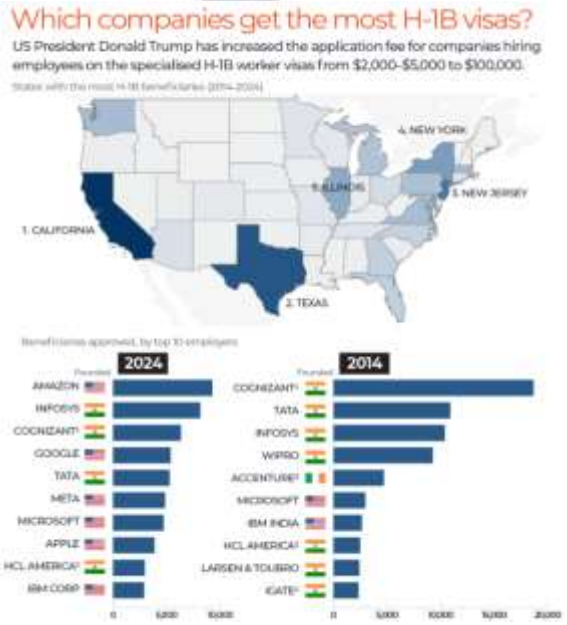
SOURCE: INDIAN EXPRESS

Why in News?

The **US President signed an executive order** mandating companies to pay **USD 100,000 per H-1B visa**, effective **21st September 2025**, valid for one year unless extended.

What is the H-1B Visa Program?

- **About:** A temporary non-immigrant visa allowing **US firms to hire skilled foreign professionals** in specialized fields such as **engineering, IT, and medicine**.
- **History:** Introduced in **1990** to meet workforce shortages in high-tech sectors.
- **Validity:** Initially for **3 years**, extendable up to **6 years**. Holders can later apply for a **Green Card**.
- **Quotas:**
  - **65,000 visas annually** under the general cap.
  - Additional **20,000 visas** for candidates with US Master's degrees or higher.
- **Exemptions:** Universities, research institutions, and nonprofit organizations.
- **Indian Dominance:** Since 2015, **70%+ visas annually go to Indians**, with China ranking a distant second (~12–13%).



Importance of H-1B for India

1. **Tech and STEM Leadership:**
   - Indians occupy **over 80% of computer-related H-1B jobs**.
   - Backbone of US firms like Google, Microsoft, Amazon.
2. **Healthcare Contribution:**
   - Indians form **22% of international medical graduates** in the US.
   - Around **5–6% of all American doctors** are Indian-origin.
3. **Educational Pathways:**
   - Many Indian students transition from **student visas (F-1)** to **H-1B**, enabling career growth abroad.
4. **Support for Indian IT Industry:**
   - Major IT firms earn **over half of their US revenue** through H-1B talent deployment.
5. **Remittances and Economy:**
   - High-earning Indian professionals in the US contribute to **billions in remittances** annually.

Impacts of the USD 100,000 Fee Hike

On Indian Professionals

- **Reduced Opportunities:** Entry-level and mid-level employees may lose out as firms reserve costly visas for only **highly specialized roles**.
- **Job Insecurity:** Renewals and transfers will decline due to high costs.
- **Career Stagnation:** Limits chances for Indian youth aiming to build global careers.

On Indian IT Companies

- **Higher Costs:** Firms like TCS, Infosys, and Wipro will lose their **cost-competitiveness** in US markets.
- **Revenue Pressure:** Decline in US contracts due to reduced manpower flexibility.
- **Forced Adaptation:** Companies will shift towards **local hiring, automation, and offshore delivery models**.

On Indian Economy

- **Falling Remittances:** Estimated loss of **USD 300–400 million annually**, impacting household incomes.
- **Currency Pressure:** Reduced inflows may weaken the already fragile **rupee performance**.

On India–US Relations

- **Strategic Strain:** Curtailing Indian talent undermines a **pillar of Indo-US partnership**.

- **Shift in Mobility Trends:** Indian professionals may pivot to **Canada, Australia, and Europe**, diluting US's tech dominance.

On US Economy

- **Talent Shortages:** Tech giants like Microsoft, Google, and Amazon will face **severe STEM workforce gaps**.
- **Higher Wages:** Firms will need to raise pay to attract domestic workers, raising operational costs.
- **Innovation Slowdown:** Restricting foreign experts may reduce **US competitiveness in emerging technologies**.

Other US Visa Categories

- **O Visa:** For individuals with extraordinary ability in science, arts, business, or sports.
- **H-2A Visa:** For temporary agricultural workers.
- **H-2B Visa:** For seasonal non-agricultural workers.
- **B-2 Visa:** For tourism, leisure, and short-term visits.
- **V Visa:** For family members of permanent residents.

Strategies India Can Adopt

1. Diplomatic Measures

- Engage through **India-US Trade Policy Forum** and **2+2 Dialogue** to highlight mutual losses.
- Explore **WTO dispute mechanisms**, citing violation of **GATS norms**.

2. IT Industry Strategy

- **Local Hiring:** Expand recruitment of US nationals to reduce dependence.
- **Diversification:** Increase focus on **Europe, Japan, Australia, Middle East**.
- **Tech Adoption:** Greater reliance on **AI, cloud, and automation** to offset workforce cuts.

3. Skill Development in India

- Upskill professionals in **AI, cybersecurity, data science, and quantum computing**.
- Encourage **reverse migration** by creating competitive opportunities at home.

4. Diaspora and Advocacy

- Mobilize the **Indian diaspora in the US** to lobby for **balanced immigration reforms**.

Conclusion

The **H-1B visa fee hike** reflects a strong **protectionist turn** in US immigration policy. While it threatens Indian IT firms, professionals, and bilateral ties, it also presents India with an opportunity to **accelerate domestic skill-building, diversify markets, and strengthen innovation ecosystems.** If handled strategically, this challenge could act as a catalyst for India's rise as a **self-reliant global tech hub.**

INDIA–MIDDLE EAST–EUROPE ECONOMIC CORRIDOR (IMEC)

SOURCE: THE HINDU

Why in News?

The **IMEC**, unveiled at the **2023 G20 Summit**, seeks to connect India to Europe via the Middle East, offering a strategic, multi-modal trade and infrastructure corridor. However, ongoing **West Asian conflicts** and emerging **Arctic shipping routes** pose challenges to its implementation and strategic viability.

About India–Middle East–Europe Economic Corridor (IMEC)

- The **India–Middle East–Europe Economic Corridor (IMEC)** is a **high-priority connectivity initiative** aimed at enhancing trade, investment, and energy cooperation between India, the Middle East, and Europe.
- Launched through a **Memorandum of Understanding (MoU) at G20 2023**, IMEC is part of the G7's **Partnership for Global Infrastructure and Investment (PGII, 2021)**.
- It offers a **transparent, debt-free alternative** to China's Belt and Road Initiative (BRI), preserving national sovereignty while promoting economic integration.

Structure and Scope

- **Eastern Corridor:** Connects India to the Gulf region.
- **Northern Corridor:** Links Gulf ports to Europe.
- **Signatories:** India, US, Saudi Arabia, UAE, France, Germany, Italy, and the EU.
- **Infrastructure Elements:** Ports, railways, roads, energy pipelines, and **undersea digital cables** for trade and energy connectivity.

- **Strategic Alignment:** Supports India's **Act West Policy**, **OSOWOG (One Sun One World One Grid)** initiative, and renewable energy integration.

Economic and Strategic Benefits

- Reduces **logistics costs by ~30%** and **transit time by ~40%** versus Suez Canal.
- Diversifies trade routes, reducing vulnerability to chokepoints like the **Suez Canal**.
- Enhances access to European markets; the **EU remains India's largest trading partner** (USD 136 billion in 2024–25).
- Promotes energy security, remittances, and stronger engagement with the **Indian diaspora**.
- Provides an alternative to China's BRI, increasing **India's geopolitical leverage**.

Challenges

1. **Geopolitical Instability:** Conflicts in Gaza, Israel-Arab tensions, and Saudi-Iran rivalry threaten corridor segments.
2. **Arctic Routes:** Emerging Northern Sea routes reduce IMEC's competitive edge in Asia-Europe shipping.
3. **Maritime Security:** Red Sea disruptions and piracy risks may impact shipping reliability.
4. **Exclusion of Regional Actors:** Turkey, Iran, Egypt not part of IMEC; strategic competition may emerge.
5. **Investment and Implementation:** High costs (USD 3–8 billion per project) and mobilization of **USD 600 billion** by 2027 remain uncertain.

Strategies for Successful Implementation

- Establish an **IMEC Secretariat** for governance, coordination, and dispute resolution.
- Expand **regional cooperation** by including Turkey, Iran, and Egypt; engage additional ports.
- Secure **financial commitments** through PPPs, green bonds, and sustainable finance.
- Mitigate trade and security risks with **route diversification** and regional security frameworks (IORA, GCC).
- Promote **technological integration**: undersea data cables, 5G, UPI-based payments, e-commerce, and smart cities along IMEC nodes.
- Active **diplomatic engagement** to resolve regional conflicts and ensure corridor stability.

Conclusion

IMEC offers India a **strategic pathway** to diversify trade and strengthen ties with the Middle East and Europe. Overcoming geopolitical and investment challenges requires **coordinated diplomacy, robust infrastructure, and technology adoption**. If implemented effectively, IMEC can enhance **India's export competitiveness, regional influence, and economic leadership** along the corridor.

GLOBAL ISSUES

WASSENAAR ARRANGEMENT

SOURCE: THE HINDU

Why in News?

Protests erupted against **Microsoft** after reports that its **Azure cloud services** were allegedly used to support Israeli military actions in **Palestine**, raising concerns about loopholes in the **Wassenaar Arrangement's export control framework**.

Background of the Wassenaar Arrangement

- **Origin:** Established in **Wassenaar, Netherlands** in 1996, replacing the Cold War-era **CoCom (Coordinating Committee on Multilateral Export Controls)**.
- **Purpose:** To prevent destabilizing accumulations of weapons and technologies that could be used for military purposes.
- **Nature:** Not a treaty but a **voluntary arrangement**; all decisions are by **consensus**.
- **Secretariat:** Located in **Vienna, Austria**.
- **Membership:** 42 countries; **India became a member in 2017**.
- **India's Role:** India chaired the **Plenary of WA in 2023**, reinforcing its commitment to non-proliferation norms.

Objectives of the Wassenaar Arrangement

- **Enhance international security** by regulating transfers of sensitive goods and technologies.
- Promote **responsible arms trade** and prevent their misuse by **terrorist organizations or rogue states**.
- Improve **transparency** among members through regular exchange of information on arms transfers.

- **Harmonize export controls** to ensure sensitive technologies do not reach actors that threaten peace.

Structure and Governance

- **Plenary:** Main decision-making body; chaired on a rotational basis.
- **Secretariat:** Provides administrative support.
- **Control Lists:**
  - **Munitions List** – covers conventional arms like tanks, combat aircraft, small arms.
  - **Dual-Use List** – covers items that can serve **civilian and military applications** (e.g., software, semiconductors, communication systems).
- **Working Procedure:** Each state enforces rules through **domestic laws and licensing**, retaining full **sovereignty**.

Evolution of Scope

- **Initial Focus:** Primarily hardware – weapons, chips, devices.
- **2013 Update:** Inclusion of **intrusion software** and cyber tools capable of bypassing network security.
- **Current Gap:** No explicit coverage of **cloud services, AI, biometric surveillance tools, or cross-border data systems**.

Importance of Wassenaar Arrangement for India

- Strengthens **India's SCOMET list** (Special Chemicals, Organisms, Materials, Equipment and Technologies).
- Facilitates **access to sensitive technologies** for space, defence, and digital sectors.
- Enhances India's profile as a responsible nuclear power despite being a **non-signatory to the NPT**.
- Supports India's **counter-terrorism diplomacy** through initiatives like **No Money for Terrorism (NMFT)**.
- Bolsters India's case for entry into the **Nuclear Suppliers Group (NSG)**, where China has opposed its membership.

Challenges Facing the Wassenaar Arrangement

1. Outdated Technology Focus

- Designed for **physical exports**, not **cloud-based services** or **digital platforms**.
- Modern **AI, big data analytics, and SaaS tools** fall into regulatory gaps.

2. Ambiguity Around Cloud Services

- Traditional rules define exports as **physical transfers**.
- Remote access, **API calls**, and **administrative rights** are not treated as exports, enabling misuse.

3. Voluntary Nature & Weak Enforcement

- Decisions are **non-binding** and depend on national discretion.
- Uneven domestic enforcement creates **loopholes**.

4. Slow Decision-Making

- **Consensus model** delays reforms.
- No fast-track mechanism for **urgent updates** on emerging tech.

5. Different National Interpretations

- Each state applies controls differently, creating **regulatory inconsistencies**.
- No global system to track **cross-border technology transfers**.

6. Limited Human Rights Safeguards

- Licensing decisions focus on **WMDs or military use**, not **civilian harm**.
- No structured mechanism to assess **human rights risks** in tech exports.

Measures to Strengthen the Wassenaar Arrangement

1. Expand Control Lists

- Include **AI systems, cloud infrastructure, biometric tools, and surveillance technologies**.
- Distinguish between **legitimate civilian applications** and potential misuse.

2. Redefine "Export" in Digital Context

- Treat **remote access, SaaS, API calls, and cloud-based transfers** as exports.
- Close loopholes in **data-driven technology transfers**.

3. Introduce Binding Standards

- Move from voluntary norms to **mandatory minimum licensing rules**.
- Establish **shared watchlists** of high-risk users and entities.

4. Agile Governance

- Create a **specialized committee** for fast-tracking updates in AI, cyber weapons, and surveillance.
- Enable **periodic reviews** to remove outdated controls.

5. Integrate Human Rights Assessment

- Add **end-user verification** considering human rights impacts.
- Ensure export controls address risks of **mass surveillance, profiling, and authoritarian misuse**.

Conclusion

The **Wassenaar Arrangement** remains a cornerstone of global export control regimes, but its **Cold War-era design**

limits its effectiveness in regulating **modern digital technologies**. Strengthening the WA will not only enhance international security but also ensure **technology is not misused to harm civilians or violate human rights**.

UNITED NATIONS REFORMS AND INDIA'S ROLE

SOURCE: THE HINDU

Why in News?

India's **External Affairs Minister**, during the **80th session of the United Nations General Assembly (UNGA)** in New York, strongly emphasized the **need for comprehensive UN reforms** and reiterated India's **readiness to assume greater global responsibilities** in reshaping the organization for contemporary challenges.

About United Nations (UN)

- The **United Nations (UN)**, established in **1945** after World War II, was envisioned as a global institution to maintain peace, security, and cooperation.
- However, nearly eight decades later, the UN faces **a serious crisis of relevance and credibility**.
- Its **structures remain outdated**, **decision-making is slow**, and **representation is unbalanced**, failing to reflect the realities of the **21st century world order**.
- As emerging powers like **India, Brazil, Germany, and Japan** rise, and as the **Global South** demands equitable participation, **UN reforms** have become both **urgent and inevitable**.

Need for UN Reforms

1. Decision-Making Gridlock

- The UN often faces **paralysis** due to political divisions among member states.
- The **veto power** of the five permanent members (P5) — USA, UK, France, Russia, and China — allows any one of them to block resolutions, even when the majority supports them.
- **Examples:**
  - Russia's veto on resolutions regarding the **Ukraine war**.
  - US vetoes on **Israel–Palestine issues**.
- Such actions weaken the credibility and neutrality of the UN in peacekeeping and conflict resolution.

2. Outdated and Unrepresentative Structure

- The **UN Security Council (UNSC)** still mirrors the power dynamics of **1945**, ignoring the geopolitical shifts of the 21st century.
- **Emerging economies** like India, Japan, Germany, and Brazil are **excluded** from permanent membership.
- **Africa and Latin America** remain **underrepresented**, which reduces global legitimacy and inclusiveness.

3. Limited Success in Conflict Resolution

- The UN's record in preventing mass atrocities is mixed.
- Historical failures in **Bosnia (1995)**, **Rwanda (1994)**, and more recent inaction in **Syria, Sudan, and Myanmar** expose structural weaknesses.
- Weak **peacekeeping mandates**, insufficient resources, and **political interference** hinder effective action.

4. Financial Dependence and Bureaucratic Inefficiency

- The UN heavily depends on a few **major donors**, especially the **United States**, leading to **financial leverage and policy influence**.
- **Administrative inefficiency**, misuse of funds, and corruption scandals (e.g., procurement fraud in UNDP) erode trust.
- The UN's **bureaucratic machinery** is slow, rigid, and ill-suited for rapid crisis response.

5. Sovereignty Concerns

- Some nations perceive the UN as a **threat to national sovereignty**, arguing that its resolutions on **human rights, climate change, or migration** may override domestic interests.
- This perception fuels **distrust and non-compliance**, reducing global consensus.

6. Rise of Alternative Global Forums

- The growing influence of **G20, BRICS, and African Union** shows that countries are increasingly relying on **regional or issue-based platforms** that are more agile and representative.
- This trend sidelines the UN and further **diminishes its centrality** in global governance.

India's Role in Driving UN Reforms

1. Leading the Call for UNSC Expansion

- As part of the **G4 nations (India, Brazil, Germany, Japan)**, India advocates for **expanding UNSC membership** to include **six new permanent seats** representing Africa, Asia-Pacific, Latin America, and Europe.
- This would correct the **anachronistic P5 dominance** and make the UNSC more representative of today's multipolar world.

2. Voice of the Global South

- India positions itself as the **spokesperson for developing countries**, emphasizing **equity, climate justice, and sustainable development**.
- Through platforms like the **Voice of the Global South Summit (2023)**, India promotes inclusive global governance and fair representation.

3. Promoting Multilateralism and Diplomacy

- India has consistently promoted **dialogue over coercion** and **negotiation over conflict**.
- With a strong record in **UN peacekeeping operations**, India champions **non-violence and collective security**.

4. Strengthening Counter-Terrorism Mechanisms

- Having faced cross-border terrorism, India calls for a **Comprehensive Convention on International Terrorism (CCIT)**.
- India also advocates for **greater accountability** of states supporting or sheltering terror groups.

5. Leveraging Soft Power and Global Credibility

- India's initiatives such as the **International Day of Yoga**, supported by 177 countries, highlight its **capacity for global consensus-building**.
- Its role in **decolonization, peacekeeping, and human rights advocacy** adds moral weight to its demand for greater UN leadership.

Steps to Ensure Effective and Inclusive Reforms

1. Text-Based Negotiations

- Move from broad discussions to **formal text-based negotiations** under the Intergovernmental Negotiations (IGN) process with **fixed timelines** to prevent delay tactics.

2. Restricting Veto Power

- Introduce **binding limitations** on veto use in cases of **genocide, war crimes, or crimes against humanity**.
- A **supermajority or General Assembly referral** could be mandated for exercising veto power.

3. Linking Membership with Contribution

- Nations contributing significantly to **peacekeeping, climate finance, or development aid** should gain **greater representation**.
- Uphold fairness under the **"capacity to pay"** principle.

4. Enhancing Transparency and Accountability

- Introduce **performance audits**, **impact assessments**, and **annual public reports** to rebuild credibility.
- Improve voting and reporting mechanisms to reduce procedural delays.

5. Institutionalizing the Voice of the Global South

- Establish **permanent Global South forums** within the UN to coordinate policy positions.
- Strengthen coalitions like **G4, IBSA, and the African Union** in UN processes.

6. Continuous Review and Adaptation

- Set up a **UN Reform Commission** with rotating membership to periodically assess global governance structures.
- Ensure **10-year review cycles** for reform evaluation and adaptation.

The **United Nations stands at a crossroads** — its credibility depends on adapting to modern geopolitical realities. Meaningful reforms that ensure **representation, transparency, and accountability** will make the UN more democratic and effective. India, with its strong diplomatic tradition and leadership in the Global South, is well-positioned to **guide the transformation** of the UN into a truly **inclusive and equitable global institution** for the 21st century.

PRELIMS POINTERS IN NEWS

NATO PIPELINE SYSTEM (NPS)

SOURCE: THE HINDU

Why in News?

Poland has announced its decision to **join the NATO Pipeline System (NPS)**, strengthening fuel security and operational readiness across Europe.

Structure and Coverage

- **Length**: Around **10,000 km**, spanning **12 NATO countries**.
- **Storage Capacity**: Nearly **4.1 million cubic metres** of fuel.
- **Infrastructure**: Includes **depots, refineries, pumping stations, rail and truck loading points**, and air base connections.
- **Control**: Managed by **national organisations**, except for the **Central Europe Pipeline System (CEPS)**, overseen by the **CEPS Programme Office** under the **NATO Support and Procurement Agency**.

Funding & Oversight

- Supported by the **NATO Security Investment Programme**.
- Supervised by the **Petroleum Committee**, which reports to the **Logistics Committee** on fuel logistics and petroleum infrastructure.

Significance

- Ensures **energy security** and rapid military mobility.
- Enhances **operational coordination** among member states.
- Reduces dependency on external fuel networks.

GLOBAL VIRUS NETWORK (GVN)

SOURCE: THE HINDU

Why in News?

The **Global Virus Network** (GVN) has expanded its reach by adding **three new Centers of Excellence in the Americas**, enhancing global collaboration in virology and pandemic preparedness.

About GVN

- **Founded in:** 2011 by **Robert Gallo**, **William Hall**, and **Reinhard Kurth**.
- **Nature:** A **coalition of leading virologists and research institutions** worldwide.
- **Headquarters:** Based in the United States.
- **Presence:** Over **80 Centers of Excellence** and **Affiliates across 40+ countries**.

Objectives

- Strengthen **global cooperation in virus research, surveillance, and diagnostics**.
- Advance understanding of **pathogenesis, vaccine development, and antiviral therapies**.
- Provide **training fellowships** to nurture the next generation of virologists.
- Offer **credible information** to the public to counter misinformation about viruses and vaccines.

Functions

- Promotes **collaborative studies** on emerging and re-emerging viruses.
- Advocates **sustained global funding and research partnerships**.
- Supports **capacity building** in developing nations for epidemic response.

Conclusion

The expansion of the **GVN** marks a stronger step toward **global scientific solidarity**. By pooling expertise across continents, it reinforces humanity's collective capacity to **detect, prevent, and combat future pandemics** effectively.

ASEAN DEFENCE MINISTERS' MEETING PLUS (ADMM-PLUS)

SOURCE: THE HINDU

Why in News?

The **12th ADMM-Plus** will be held in **Kuala Lumpur, Malaysia, in November 2025**, where **Defence Minister Rajnath Singh** will represent India.

About ADMM-Plus

- **Established:** 2010 in **Hanoi, Vietnam**.
- **Members:** 10 ASEAN countries + 8 dialogue partners — **India, USA, China, Russia, Japan, South Korea, Australia, and New Zealand**.

- **Frequency:** Annual since 2017.
- **Chairmanship:** Rotates annually with the ASEAN Summit host nation.

Objectives

- Promote **regional peace, security, and stability** through defence cooperation.
- Enhance **mutual trust, transparency, and information-sharing** among defence establishments.
- Build **ASEAN's capacity** to respond to shared security challenges.

India's Role

- India is **co-chair (2024–2027)** of the **Experts Working Group on Counter-Terrorism** (with Malaysia).
- Actively promotes **maritime security, humanitarian assistance, and cyber cooperation** under its **Act East Policy**.

Focus Areas

- Counter-terrorism, Maritime Security, Peacekeeping, Cyber Security, Disaster Relief, Military Medicine, and Mine Action.

Conclusion

ADMM-Plus embodies **ASEAN centrality** in Indo-Pacific security. For India, it is a vital platform to **deepen strategic defence ties**, counter terrorism, and strengthen a **rules-based maritime order**.

UAE CONSENSUS (COP28 OUTCOME)

SOURCE: INDIAN EXPRESS

Why in News?

A recent **IRENA report** assessed progress on the **UAE Consensus**, which calls for tripling renewable energy capacity and doubling energy-efficiency improvements by **2030**.

About the UAE Consensus

- **Adopted at: COP28 (Dubai, 2023)** under the **UNFCCC**.
- **Participants:** 197 countries and the **European Union**.
- **Key Element:** Included the **First Global Stocktake (GST)** to assess progress on the **Paris Agreement goals**.

Major Highlights

- Recognizes the need to **transition away from fossil fuels** in a just, orderly, and equitable manner.
- Calls for **tripling renewable energy capacity** and **doubling efficiency gains** by **2030**.
- Endorses **global net-zero emissions by 2050** and encourages stronger **NDCs (Nationally Determined Contributions)**.
- For the first time, formally acknowledges **Carbon Capture, Utilization, and Storage (CCUS)** and other **abatement technologies**.

Significance

- Aligns with global efforts to **limit warming to 1.5°C**.
- Serves as a **bridge between developed and developing nations** on climate ambition and finance.

Conclusion

The **UAE Consensus** represents a crucial leap toward global climate accountability. However, its success hinges on **rapid policy implementation, technology transfer, and adequate climate financing** by all countries.

DUTY-FREE TARIFF PREFERENCE (DFTP) SCHEME

SOURCE: THE HINDU

Why in News?

A **WTO report (2025)** recognized India as the **top developing-country partner** for Least Developed Countries (LDCs), offering more extensive duty-free market access than **China or the EU**.

About the Scheme

- **Launched:** 2008, following the **WTO Hong Kong Ministerial Declaration (2005)**.

- **Administered by:** Ministry of Commerce and Industry, Government of India.
- **Objective:** To enhance **market access for exports from LDCs**.
- **Coverage:** Around **98.2% of tariff lines** are duty-free; only 1.8% attract normal duties.

Beneficiary Countries

- All **UN-designated LDCs** (approx. 48 countries across Asia, Africa, and the Pacific).

Key Benefits

- **Boosts export earnings** and trade diversification in LDCs.
- Promotes **industrialization, job creation, and poverty reduction**.
- Provides **technical assistance and quality training** to improve export competitiveness.
- Enhances **South–South cooperation** and India's reputation as a **development partner**.

Conclusion

India's **DFTP Scheme** demonstrates a model of **inclusive trade diplomacy**, supporting LDC integration into the global economy. It reflects India's commitment to **equitable globalization** and the principles of **Vasudhaiva Kutumbakam** in trade policy.

NATIONAL RED LIST ASSESSMENT (NRLA) INITIATIVE

SOURCE: DOWN TO EARTH

Why in News?

India launched its **National Red List Roadmap** at the **IUCN World Conservation Congress in Abu Dhabi (2025)**, presenting **Vision 2025–2030** for assessing and publishing conservation data for Indian species.

About the Initiative

- The **National Red List Assessment (NRLA)** is a **science-driven framework** to evaluate the conservation status of India's flora and fauna using **IUCN's global standards**.
- **Lead Agency:** Ministry of Environment, Forest and Climate Change (MoEFCC).
- **Implementing Bodies: Zoological Survey of India (ZSI)** and **Botanical Survey of India (BSI)**, in partnership with **IUCN–India** and the **Centre for Species Survival (WTI)**.
- **Funding:** ₹95 crore from public funds.

Objectives

- Develop a **nationally coordinated red-listing system** to guide conservation policy and resource allocation.
- Produce **National Red Data Books** for plants and animals by **2030**.
- Conduct **comprehensive threat assessments** of native species.

Ecological Context

- India, a **megadiverse nation**, hosts **8% of global flora and 7.5% of fauna**, with over **30% endemic species**.
- Supports four biodiversity hotspots — **Himalayas, Western Ghats, Indo-Burma, and Sundaland**.

Significance

- Strengthens India's commitments under the **Convention on Biological Diversity (CBD)** and **Kunming–Montreal Global Biodiversity Framework (GBF)**.
- Aligns with the **National Wildlife Action Plan (2023–2032)** for species protection.

Conclusion

The **NRLA** marks a major step in India's journey toward **data-driven biodiversity conservation**. It will enhance ecological accountability, improve policy coherence, and fortify India's role in achieving **global biodiversity targets by 2030**.

MOSCOW FORMAT CONSULTATIONS ON AFGHANISTAN

SOURCE: THE HINDU

Why in News?

India took part in the **7th Moscow Format Consultations (2025)** along with **Russia, China, Iran, Pakistan, and Central Asian nations**, marking the formal inclusion of the **Taliban government** for the first time.

About the Platform

- Established in **2017**, the **Moscow Format** is a **regional consultation mechanism** focused on **Afghanistan's peace, security, and development**.
- Originated from earlier **six-party talks** led by Russia in 2017.
- **Participants:** Russia, India, China, Iran, Pakistan, Afghanistan, and five Central Asian states.

Objectives

- Coordinate regional strategies for **Afghan reconciliation** and **counter-terrorism**.
- Ensure **humanitarian aid** remains depoliticized.
- Promote **economic connectivity and stability** in the region.

Key Highlights of the 2025 Meet

- **Taliban participation** acknowledged formally.
- Participants opposed any **foreign military bases** in Afghanistan.
- Emphasis on **regional economic integration** and humanitarian cooperation.

India's Role

- Advocates for **inclusive governance**, **counter-radicalization**, and **regional stability**.
- Stresses the need to protect **minorities, women's rights**, and **humanitarian access**.

Conclusion

The **Moscow Format** offers a pragmatic path to ensure **regional coordination** on Afghanistan. For India, it remains a crucial forum to advance its **security and connectivity interests** in an evolving regional landscape.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)

SOURCE: HINDUSTHAN TIMES

Why in News?

India was **re-elected to Part II** of the **ICAO Council** for the **2025–2028 term** at the **42nd ICAO Assembly in Montreal**, reaffirming its global aviation leadership.

About ICAO

- **Established:** 1947 under the **Chicago Convention (1944)**.
- **Type:** Specialized UN agency overseeing **international civil aviation standards**.
- **Headquarters:** Montreal, Canada.
- **Membership:** 193 countries.

Structure

- **Assembly:** The supreme body meeting every three years to review work and set policy.
- **Council:** 36 members elected for three years; adopts **Standards and Recommended Practices (SARPs)**.
- **Secretariat:** Headed by a Secretary General for technical and administrative functions.

Functions

- Promotes **safe, secure, sustainable, and harmonized** air navigation.
- Facilitates **standard-setting** for civil aviation operations and air traffic management.
- Encourages **gender inclusivity** and **environmental sustainability** in aviation.

India and ICAO

- **Founding member** since 1944.
- Holds **Part II seat**, representing nations that contribute significantly to **air navigation facilities**.
- Plays a leading role in **sustainable aviation fuels**, **green airports**, and **regional air connectivity**.

Conclusion

India's re-election to the **ICAO Council** underscores its status as a **key aviation hub** and a **responsible global actor**. It strengthens India's voice in shaping the future of **safe and sustainable international air travel**.

AUSTRALIA-INDIA CLEAN ENERGY PARTNERSHIP

Why in News?

Australia and India have elevated their cooperation through the India-Australia Renewable Energy Partnership (REP), reflecting their shared goal of scaling clean energy deployment and reducing dependence on China's critical-materials supply chains.

Key Drivers of the India-Australia Clean Energy Partnership

1. Climate Imperatives in the Indo-Pacific

- The Indo-Pacific region already records about **10 climate disasters per month** on average (1970-2022), with estimates suggesting up to **89 million people may be displaced** and **80% of the population affected** by 2050.
- For India, with its target of **500 GW of non-fossil capacity by 2030** (including ~280 GW from solar), and Australia aiming for a **62-70% reduction in emissions by 2035** and net-zero by 2050, the partnership helps both bridge the gap between ambition and implementation.

2. Critical-materials and supply-chain diversification

- China dominates critical minerals and manufacturing: it refines over **90% of rare earth elements** and produces around **80% of solar modules globally**. This creates a strategic vulnerability.
- Australia is rich in lithium, cobalt, and rare earths but lacks large-scale downstream manufacturing capacity. India has scale, a skilled workforce (via Skill India) and major market demand, but relies heavily on imports.
- Under the partnership, Australia can supply raw materials and technology; India can provide manufacturing scale, demand and skilled labour—together creating a **resilient clean energy supply chain**.

3. The Framework of the Renewable Energy Partnership (REP)

- Launched in November 2024, the REP outlines cooperation across **eight key areas**: solar PV; green hydrogen; solar supply chains; energy storage; circular economy in renewables; two-way investment; capacity-building; and allied priorities.
- A "Track 1.5" dialogue is embedded in the structure: engaging policymakers, industry and research institutions to translate ambition into action.
- Delivered outcomes include: establishment of a solar-rooftop skills training centre in India targeting ~2,000 technicians in first two years (focusing on women and youth).

4. Mutual Complementarity in Clean-Energy Ecosystems

- India's massive domestic market, ambitious manufacturing incentives (PLI schemes), skill development push and renewables capacity growth make it a natural partner. For instance, India's renewables capacity already crossed **220 GW** by March 2025.
- Australia's regulatory stability, critical-mineral resources, technology base (in green hydrogen, energy storage, solar manufacturing) make it a strong supplier and collaborator.
- The partnership therefore aligns economic growth, energy security and climate goals in both countries.

Why This Partnership Matters for India

- **Energy transition acceleration**: By tapping into Australia's resources and technology, India can reduce project risk, cost and timeline.
- **Manufacturing ecosystem building**: A joint supply-chain logic means India can localise more components (solar modules, batteries, hydrogen equipment) and reverse supply-chain dependency.
- **Skill & jobs creation**: With Australia helping train technicians, and India's PPIs and market scale, there is potential for millions of green-jobs in the next decade.
- **Geo-strategic resilience**: Diversifying supply chains away from a single dominant player reduces vulnerability and enhances India's strategic autonomy in the green-energy era.

Renewable Energy in India

India is undergoing a major **energy transition**, reducing dependence on fossil fuels while creating green jobs, enhancing energy security, and promoting sustainable development.

Sectoral Breakdown:

- **Solar:** 105.65 GW installed; 23.83 GW added in FY 2024–25, making solar the largest RE contributor.
- **Wind:** 50.04 GW total, with 4.15 GW added; offshore wind is being explored in Gujarat and Tamil Nadu.

- **Bioenergy:** 11.58 GW including off-grid and waste-to-energy projects; supports ethanol blending and circular economy.
- **Small Hydro:** 5.10 GW, powering remote regions.

Panchamitra Plan: Targets **500 GW non-fossil energy by 2030**, 50% renewable share, carbon intensity reduction, and Net Zero by 2070.

Conclusion

The **India–Australia Clean Energy Partnership** marks a practical step toward achieving energy security through shared strengths in resources, technology, and market scale. If implemented effectively, it can emerge as a **model for sustainable and strategic climate cooperation** in the 21st century.

ECONOMY

BANKING AND FINANCIAL INTERMEDIARIES

CLEAN SLATE DOCTRINE UNDER THE INSOLVENCY AND BANKRUPTCY CODE (IBC)

SOURCE: THE HINDU

Why in News?

The **Delhi High Court** reaffirmed the **Clean Slate Doctrine**, ruling that a **successful resolution applicant** under the **IBC** cannot be held liable for past criminal or financial offences of the debtor company.

About Clean Slate Doctrine

- The **Clean Slate Doctrine** is a foundational principle under the **Insolvency and Bankruptcy Code, 2016**, ensuring that a company emerging from insolvency is granted a **fresh start**—free from prior debts and liabilities.
- It fosters confidence among investors and promotes smoother corporate resolution.

Core Concept

- Once a **resolution plan** is approved by the **NCLT**, all **previous liabilities**, including debts, penalties, and litigations, are extinguished.
- The **new owner** takes over the company without historical burdens.
- The doctrine ensures **finality and certainty** in the insolvency resolution process.

Judicial Validation

- **Essar Steel Case (2019):** The Supreme Court upheld that **approved resolution plans override all previous claims**, ensuring clean ownership transfer.
- **Edelweiss ARC Case:** Government dues not included in the plan **stand extinguished**.
- **Surya Exim Case (Gujarat HC):** Post-resolution **tax demands are invalid** if not part of the approved plan.

Objectives and Significance

- Encourages **investor participation** in stressed asset resolution.
- Prevents **endless litigation** and **revival delays**.
- Supports the IBC's main aim — **revival over liquidation**.
- Promotes India as a **reliable insolvency jurisdiction**.

Criticisms

- May be misused by errant promoters to **escape accountability**.
- Needs **robust due diligence** and **clear segregation** between management and corporate liability.
- Some argue it should not shield **criminal misconduct** entirely.

AGRICULTURE AND ALLIED

FOODGRAIN STORAGE SYSTEM IN INDIA

SOURCE: PIB

Why in News?

India has achieved a **record foodgrain production of 353.96 million tonnes in 2024-25** (Third Advance Estimates). With this surplus, **modern storage infrastructure** has become essential to reduce post-harvest losses, stabilize prices, and strengthen food security.

Foodgrain Storage System in India

- It is a **network of facilities** that preserve harvested grains, prevent losses, and ensure year-round supply.

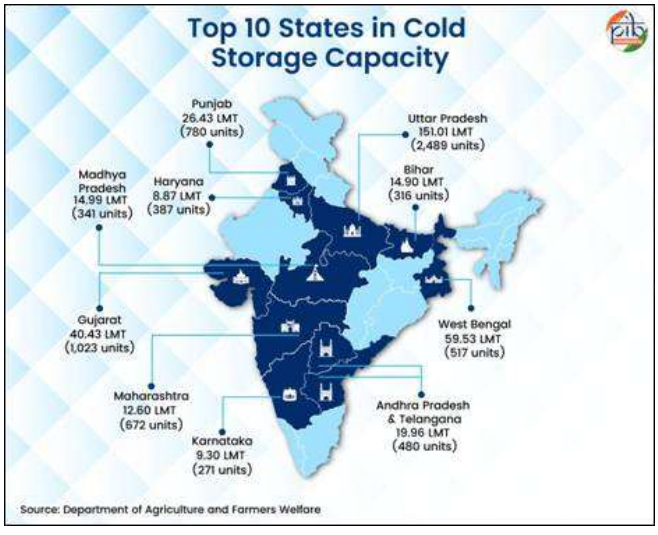
- It integrates **centralized, decentralized, and traditional methods** linking farmers, government agencies, and markets.
- Around **60–70% of foodgrain** is stored at the **household level**, often in indigenous methods like **Morai, Mud Kothi, or earthen bins**.

Government Storage Agencies

1. **Food Corporation of India (FCI):**
   - Established in **1965**, it is the **main agency** for procurement and storage.
   - Operates silos, godowns, and Cover and Plinth (CAP) structures.
   - Currently manages a **capacity of 917.83 LMT** along with state agencies.
2. **Central Warehousing Corporation (CWC):**
   - Established under the **Warehousing Corporations Act, 1962**.
   - Provides storage for agriculture and other notified commodities.
3. **State Warehousing Corporations (SWCs):**
   - Set up under respective state laws.
   - Operate godowns and warehouses at the state level.

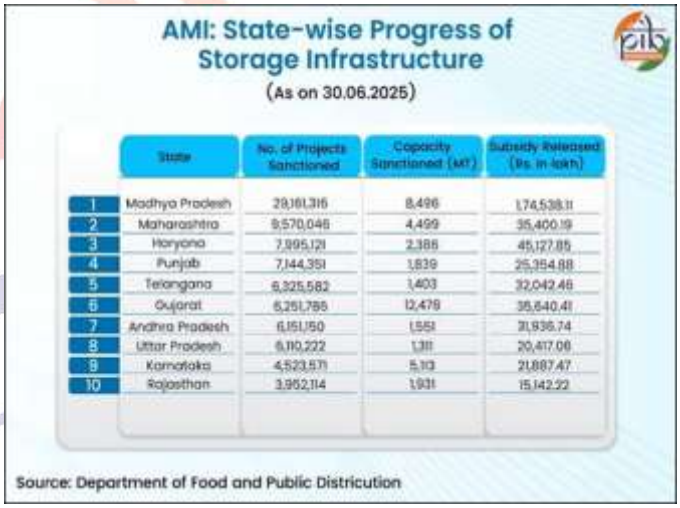
Importance of Foodgrain Storage

- **Reduces Post-Harvest Losses:** Ensures grain **quality and quantity** are maintained.
- **Ensures Food Security:** Maintains **buffer stocks** for PDS and emergencies.
- **Stabilizes Prices:** Releases stocks during shortages to prevent **price spikes**.
- **Supports Farmers' Income:** Allows farmers to **avoid distress sales** by selling later at better prices.
- **Boosts Supply Chain:** Ensures steady availability for **food processing and exports**.



Government Initiatives to Strengthen Storage

- **Agriculture Infrastructure Fund (AIF) (2020):** Provides **debt financing with interest subvention** for warehouses, cold chains, and post-harvest assets.
- **Agricultural Marketing Infrastructure (AMI):** Aims at **godown and warehouse construction** in rural areas.
- **Pradhan Mantri Kisan SAMPADA Yojana (PMKSY):** Develops modern **food processing and storage infrastructure**, reduces wastage, and increases exports.
- **Schemes for Storage Capacity Expansion:**
  - Construction of **Steel Silos** for modernized storage.
  - **PEG Scheme** to attract private entrepreneurs.
  - **Central Sector Scheme on Storage & Godowns**, especially for **North-East and tribal areas**.



Challenges in Grain Storage

- **High Post-Harvest Losses:** Nearly **22% of total output** (~74 million tonnes) lost annually.
- **Storage-Specific Losses:** About **6.58% grains** lost due to pests, rodents, and moisture.
- **Economic Losses:** Estimated at **₹7,000 crore annually**, with insects alone causing ~₹1,300 crore damage.
- **Overdependence on CAP:** Nearly **90% of wheat in Punjab** stored in open CAP, vulnerable to rain and pests.
- **Regional Imbalances:** North-East, hilly, and tribal areas face **acute storage gaps**.
- **Limited PPP Involvement:** Private investment remains low due to lack of incentives.

Measures to Enhance Grain Storage

- **Expand Scientific Storage:** Scale up **steel silos and modern warehouses** across states.
- **Improve Post-Harvest Practices:** Ensure proper **drying, cleaning, and moisture control**.
- **Promote PPPs:** Provide **long-term guarantees** under PEG to attract private sector.
- **Strengthen PACS (Primary Agricultural Credit Societies):**
  - Fast-track **computerisation of 63,000 PACS** to improve efficiency.
  - Use PACS-based godowns for **local procurement and storage**.
- **Regional Focus:** Special incentives for **North-East, tribal and hilly regions**.
- **Integrate Cold Chains:** Develop storage for **perishables** alongside foodgrains.

Conclusion

India's success in becoming a **food-surplus nation** is incomplete without robust storage and distribution. **Scientific storage through silos, PACS godowns, and cold chains** is vital to reduce post-harvest losses and maintain food security. Strengthening storage infrastructure will ensure **price stability, farmer prosperity, and a resilient food system** for the future.

LANDSCAPE OF FOOD PROCESSING IN INDIA

SOURCE: PIB

Why in News?

Food processing refers to the **conversion of raw farm, animal, or fish products** into **edible, marketable, and long-lasting forms** through various levels of processing.

Levels of Processing

1. **Primary Processing:** Cleaning, grading, packaging (e.g., cereals, pulses).
2. **Secondary Processing:** Converting raw material into food (e.g., wheat into flour).
3. **Tertiary Processing:** Ready-to-eat products (e.g., noodles, bakery products).

Current Status

- India is the **largest producer** of milk, pulses, onions, and the **second largest** producer of rice, wheat, sugarcane, fruits & vegetables.
- Food exports touched **USD 49.4 billion in 2024–25**, with processed foods forming **20.4%** share.
- The sector employs **2.23 million workers** in registered units and **4.68 million** in unregistered ones.
- Number of registered **food business operators** rose from **25 lakh to 64 lakh**.
- Infrastructure boost through **24 Mega Food Parks**, R&D initiatives, and the **Operation Greens** scheme.

Government Initiatives

- **Production Linked Incentive (PLI) Scheme:** Encourages large-scale investment in food processing and branding.
- **PLI for Millet-based Products:** Promotes RTE/RTC millet products in line with India's **"Shree Anna" (millet) mission.**
- **Pradhan Mantri Kisan Sampada Yojana (PMKSY):** Reduces post-harvest losses, builds storage and processing facilities.
- **PM Formalisation of Micro Food Processing Enterprises (PMFME):** Provides credit, skill, and business support to small units.
- **100% FDI** permitted in food processing under **Make in India.**
- **Mega Food Parks:** Integrated hubs for processing, logistics, and value addition (₹50 crore per project).

Opportunities in the Sector

- **Expanding Market:** Industry valued at **USD 336 billion (2023)**, expected to double by 2032.
- **Urbanisation:** Rising demand for packaged and convenience foods, projected to touch **₹12 lakh crore by 2025.**
- **Health and Organic Foods:** Growing shift to **organic, plant-based, and wellness foods**; organic market likely to reach **₹75,000 crore by 2025.**
- **Technology and Innovation:** Use of **AI, robotics, IoT, and blockchain** for quality and supply chain efficiency.
- **MSMEs and Rural Employment:** With **63 million MSMEs**, food processing can enhance farmer incomes and rural entrepreneurship.

Challenges in the Sector

- **Post-Harvest Losses:** Nearly **30% food wastage**, costing ₹90,000 crore annually due to weak storage and transport.
- **Infrastructure Gaps:** Limited **cold chain and logistics** systems.
- **Technology and Finance Barriers:** SMEs struggle with modern machinery costs and **restricted credit access**.
- **Regulatory Complexity:** Multiple agencies like **FSSAI, APEDA, BIS**, causing high compliance costs.
- **Low Share in Processed Exports:** Only **16% of India's agri-exports** are processed (vs 25% in US, 49% in China).
- **Quality Issues:** Frequent rejections abroad (e.g., **527 products rejected by EU in 2024**).

Measures to Strengthen Food Processing

1. **Cluster Development:** Create **integrated food zones** near farm hubs with storage, packaging, and transport facilities.
2. **Tech-Driven Supply Chain:** Use **AI, IoT, blockchain, drones** for forecasting, traceability, and reducing wastage.
3. **Financial Reforms:** Sector-specific credit, **credit guarantee fund** for SMEs, and tax incentives for food-tech investments.
4. **Quality Standards:** Harmonise Indian norms with **global Codex standards**; promote mobile testing labs and certification.
5. **Regulatory Simplification:** Single-window clearance, unified digital platform to cut red tape.
6. **Export Ecosystem:** Export-specific clusters, market intelligence system, global branding strategies.
7. **R&D Support:** Innovation labs, tax incentives, and database of **traditional food techniques** for scaling up.

Conclusion

The **World Food India 2025** reaffirms India's ambition to emerge as a **global hub in food processing**, ensuring value addition, employment, and farmer prosperity. By bridging **infrastructure gaps, simplifying regulations, and encouraging innovation**, India can transform its agri-food ecosystem. A stronger, technology-driven food processing sector will not only reduce wastage but also make India a **key player in global food security.**

DAIRY SECTOR OF INDIA

SOURCE: THE HINDU

Why in News?

India's **dairy sector has grown by nearly 70%** in the last 11 years, with milk production rising from **146 million tonnes in 2014-15 to 239 million tonnes in 2023-24**, highlighting its strong role in rural income and food security.

India's Position in the Global Dairy Landscape

- **Largest Producer:** India contributes around **24.76% of global milk output**, maintaining its leadership in the dairy industry.
- **Economic Significance:** Dairy is India's **single largest agricultural commodity**, forming about **5% of the national GDP**.
- **Employment Impact:** More than **8 crore rural families** depend on dairying for their livelihood.
- **Per Capita Availability:** The per capita milk availability increased to **471 grams/day in 2023-24**, well above the **global average of 322 grams/day**.
- **Leading States:** The top milk-producing states include **Uttar Pradesh, Rajasthan, and Madhya Pradesh**, together accounting for a major share of total output.

Growth Drivers of India's Dairy Success

1. Institutional Framework and Policy Support

- The establishment of the **National Dairy Development Board (NDDB)** in 1965 at Anand, Gujarat, helped replicate the **Amul cooperative model** nationwide.

- **Operation Flood (1970)**—also called the **White Revolution**—was the most transformative programme, creating a nationwide grid for milk procurement, processing, and marketing.
- In 1987, NDDB was recognized as an **Institution of National Importance** by an Act of Parliament, strengthening its authority to lead sectoral reforms.

2. Growth in Bovine Productivity

- India has over **303 million bovines**, forming the backbone of milk production.
- Between **2014 and 2022**, bovine productivity increased by **27.39%**, surpassing growth rates in countries like **China, Germany, and Denmark**.
- Improved breeding technologies, better feed management, and animal health programmes have contributed to higher yields.

3. Cooperative and Organisational Network

- The dairy cooperative structure includes:
  - 22 milk federations,
  - 241 district cooperative unions,
  - 28 marketing dairies, and
  - 25 Milk Producer Organisations (MPOs).
- These cooperatives ensure **fair prices for farmers** and reduce dependence on middlemen.

4. Women Empowerment

- Nearly **70% of the dairy workforce** comprises women, and about **35% actively participate** in cooperative activities.
- Dairying provides women with **income autonomy**, decision-making power, and social recognition.

Structural Challenges in India's Dairy Sector

1. Low Productivity of Breeds

- The **average yield** of Indian cows stands at **1.64 tonnes per year**, compared to **7.3 tonnes in the EU** and **11 tonnes in the US**.
- Indigenous breeds have low productivity due to poor feed, genetic limitations, and health issues.

2. Feed and Land Constraints

- Unlike countries such as New Zealand, India lacks **extensive grazing pastures**.
- Dependence on **crop residues and purchased feed** makes dairying more expensive and less sustainable.

3. Labour-Intensive Nature

- Dairy activities such as **feeding, milking, and cleaning** rely heavily on **unpaid family labour**, particularly women.
- The absence of mechanisation reduces efficiency and limits scalability.

4. Climate and Market Vulnerabilities

- **Heat stress** and **climate variability** impact milk yield and animal health.
- Rising **input costs** and **price fluctuations** create instability in farmers' incomes.
- In 2023–24, overall milk production growth slowed to **3.78%**, and **buffalo milk output** fell by 16%.

5. Post-Harvest and Infrastructure Gaps

- Limited **cold-chain facilities**, **processing plants**, and **transportation networks** lead to milk spoilage and quality loss.
- Only a small portion of total milk is processed into **value-added products** like cheese, butter, and yogurt.

Way Forward

- Promote **genetic improvement** and **scientific breeding programmes** for indigenous breeds.
- Expand **fodder cultivation** and strengthen feed supply chains.
- Encourage **value addition** through dairy processing, branding, and exports.
- Invest in **climate-resilient infrastructure**, cold storage, and digital supply chains.
- Empower women through **financial inclusion, cooperative leadership**, and skill training.

Conclusion

India's dairy sector represents the **heart of rural economic growth**, ensuring food security, employment, and gender inclusion. Through continued innovation, institutional support, and farmer participation, India can move from being the **largest milk producer** to a **global dairy powerhouse**. Strengthening productivity, sustainability, and value addition will mark the next phase of India's **White Revolution 2.0**.

EMPOWERING FARMERS THROUGH SKILL DEVELOPMENT AND TRAINING

SOURCE: PIB

Why in News?

Recent government data highlights a sharp rise in **farmer training and rural skilling programmes**, reflecting a strategic push to modernise agriculture.

With the sector facing challenges of productivity, climate resilience, and market access, **skill development has emerged as a key policy lever** to empower India's agrarian workforce.

Institutional Platforms for Farmer Training

1. Krishi Vigyan Kendras (KVKs)

- Operated by ICAR at the district level.
- Delivered **hands-on training to 76.58 lakh farmers** between 2021 and February 2025.
- Focus on **field demonstrations, crop management, and allied activities**.

2. Agricultural Technology Management Agency (ATMA)

- Promotes **decentralised extension reforms**.
- Trained **1.27 crore farmers** through **state-led exposure visits, demonstrations, and capacity building**.

Skilling Rural Youth and Mechanisation

1. Skill Training of Rural Youth (STRY)

- Offers **short-term vocational courses** in agriculture and allied sectors.
- Trained **43,000 youth** between 2021–2024, creating a pool of **skilled rural manpower**.

2. Sub-Mission on Agricultural Mechanisation (SMAM)

- Encourages **farm mechanisation and custom hiring services**.
- Trained **57,139 farmers** to operate and maintain agricultural machinery.

Knowledge Enhancement in Soil, Resources & Value Chains

1. Soil Health Card Scheme

- Distributed **25.17 crore cards** till July 2025.
- Conducted **93,000+ training sessions** and **6.8 lakh demonstrations** to promote **balanced nutrient use**.

2. Farmer Producer Organisations (FPOs)

- Over **10,000 FPOs registered**, offering training in **agri-business, digital platforms (e-NAM, GeM)**, and **market linkages**.

Sector-Specific Skilling Initiatives

1. Pradhan Mantri Kaushal Vikas Yojana (PMKVY 4.0)

- Integrated agriculture into its skilling framework.
- Trained **1.64 crore individuals** and certified **1.29 crore** since 2015.

2. Mission for Integrated Development of Horticulture (MIDH)

- Trained **9.73 lakh farmers** in **scientific horticulture practices** between 2014–2024.

3. Rashtriya Gokul Mission (RGM)

- Focused on **livestock breeding and artificial insemination**.
- Trained **38,736 technicians**, improving **breed quality and productivity**.

4. Pradhan Mantri Kisan SAMPADA Yojana (PMKSY)

- Strengthens **agro-processing infrastructure**.
- Approved **1,601 projects**, benefiting **34 lakh farmers** by reducing post-harvest losses.

Agricultural Performance Insights (Economic Survey 2024–25)

- **Sector Growth**: Agriculture grew at **5% annually (2016–23)**.
- **Income Rise**: Farm income increased by **5.23% per year** over the last decade.
- **Fisheries & Livestock**: Fastest-growing sub-sectors at **13.67% and 12.99%**, respectively.
- **Irrigation Coverage**: Improved from **49.3% to 55%** of Gross Cropped Area (GCA).
- **State Performance**: Punjab (98%), Haryana (94%), Telangana (86%) lead in irrigation; Jharkhand and Assam lag below 20%.

Conclusion

India's agricultural skill development strategy is **multi-dimensional**, targeting both **farmers and rural youth**. By integrating **technology, training, and market access**, these initiatives are laying the foundation for a **resilient and modern farm economy**. Continued investment in skilling will be **key to unlocking rural prosperity**.

NATURAL FARMING IN INDIA – TOWARDS SUSTAINABLE AGRICULTURE

SOURCE: THE HINDU

Why in News?

Himachal Pradesh has become a key model in India's agricultural transformation, as thousands of farmers shift from chemical-based farming to natural farming methods. This movement is part of India's broader strategy for **climate-resilient and sustainable agriculture**.

About Natural Farming

- Natural farming represents a return to **eco-friendly and traditional cultivation practices**, aligning with India's goal of sustainable food systems.
- Defined by **NITI Aayog** as a *chemical-free, agroecological method* of farming, it emphasizes harmony with nature and rejects the excessive use of synthetic fertilizers and pesticides.

Core Principles and Features

1. Zero Chemical Dependency

- **Completely eliminates** synthetic fertilizers, pesticides, and herbicides.
- Promotes the use of natural inputs like **Jeevamrit, Beejamrit, Neemastra, and Agniastra** made from cow dung, cow urine, jaggery, gram flour, and soil.

2. On-Farm Input Generation

- Farmers prepare their own inputs, reducing reliance on external suppliers.
- Encourages self-sufficiency and minimizes production costs.

3. Integration of Livestock

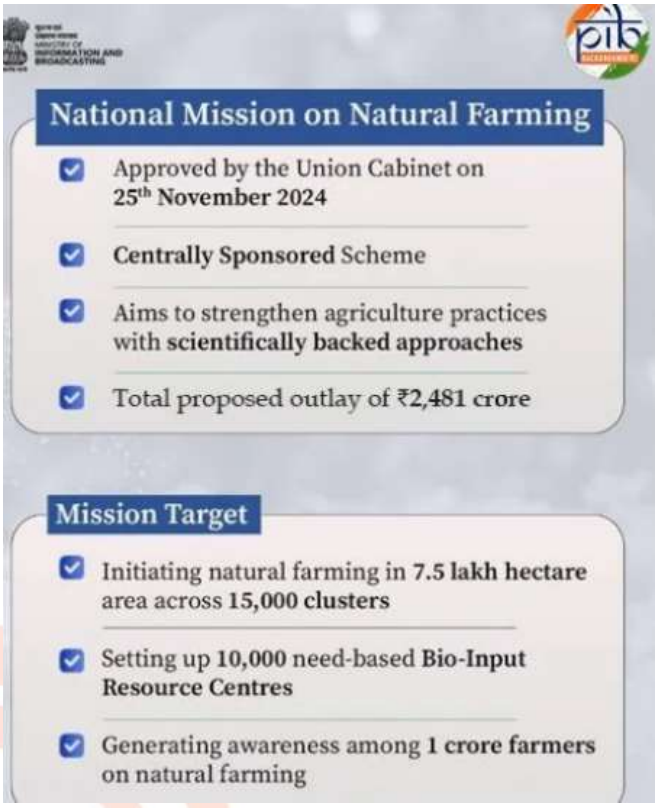
- **Native cow breeds** are central to nutrient cycling and soil enrichment.
- Livestock ensures steady supply of dung, urine, and organic matter.

4. Diversified Cropping Systems

- Promotes **intercropping, mixed farming, crop rotation, and agroforestry.**
- Helps in pest control, soil fertility, and income diversification.

5. Soil and Water Conservation

- Emphasizes **mulching and cover cropping** to enhance soil moisture and microbial activity.
- Improves water-use efficiency, vital in drought-prone regions.



Benefits for Farmers and Rural Economy

1. Reduced Cost of Cultivation

- Input costs drop by **50–60%** compared to chemical farming.
- Popular models like **Zero Budget Natural Farming (ZBNF)** make agriculture less risky and more sustainable.

2. Improved Farm Incomes

- Although yields may initially stabilize or slightly dip, **long-term soil health** ensures sustained productivity.
- Intercropping and local value addition improve income security.

3. Employment and Entrepreneurship

- Generates rural jobs in **bio-input production, composting, seed banks, and FPOs.**
- Encourages **rural youth and women participation** in agriculture-linked enterprises.

4. Health and Food Safety

- Natural produce is free from harmful residues, enhancing **nutritional quality and consumer trust.**
- Addresses hidden hunger and reduces health risks from chemicals.

5. Women's Involvement

- Women play a key role in preparing natural inputs and managing small farms.
- Strengthens community farming and gender inclusion in agriculture.

Government Initiatives Promoting Natural Farming

1. National Mission on Natural Farming (NMNF)

- Launched by the **Ministry of Agriculture & Farmers Welfare**, focusing on chemical-free, ecosystem-based farming.
- Targets **7.5 lakh hectares across 15,000 clusters** and **1 crore farmers**.
- Offers **₹4,000 per acre per year for two years** as incentive.
- Builds upon earlier schemes like **Bhartiya Prakritik Krishi Paddhati (BPKP)** under **PKVY**.

2. Bhartiya Prakritik Krishi Paddhati (BPKP)

- As of **March 2025**, supports **28 lakh farmers on 9.4 lakh hectares**.
- Promotes traditional and region-specific sustainable practices.

3. State-Level Efforts

- **Himachal Pradesh, Andhra Pradesh, and Gujarat** are leading models.
- Himachal promotes natural farming through **Prakritik Kheti Khushhal Kisan Yojana**, covering thousands of farmers.

Challenges in Scaling Natural Farming

1. Knowledge and Skill Gaps

- Requires ecological understanding and training.
- Farmers need regular guidance from **Krishi Sakhis, KVKs**, and extension officers.

2. Behavioural and Cultural Barriers

- Farmers accustomed to chemical inputs find it difficult to switch.
- Short-term yield uncertainty discourages immediate adoption.

3. Regional and Climatic Variation

- Success varies across states due to **soil and climatic diversity.**
- One-size-fits-all model is ineffective.

4. Market and Price Challenges

- Lack of **certified markets and premium pricing** for natural produce.
- Weak **supply chains** and certification hurdles affect scalability.

5. Institutional Convergence Issues

- Coordination across multiple ministries and schemes remains a challenge.
- Need for policy coherence among agriculture, livestock, and rural development programs.

Way Forward

1. Cluster-Based Expansion

- Promote **contiguous clusters** of natural farming villages to encourage peer learning and collective branding.

2. Strengthen Knowledge and Training

- Deploy **Krishi Sakhis and Farmer Field Schools** for continuous capacity building.

3. Bio-input Resource Hubs

- Set up **local Bio-Input Resource Centres (BRCs)** to ensure supply of quality inputs.

4. Market Integration

- Develop **Participatory Guarantee System (PGS)** certification and national branding for NF produce.
- Strengthen linkages with **APMCs, FPOs**, and local cooperatives.

5. Research and Digital Monitoring

- Encourage **region-specific research** in soil health and crop suitability.
- Use **geo-tagging and mobile-based platforms** for adoption tracking and farmer support.

Conclusion

Natural farming marks a shift toward eco-friendly, low-cost, and climate-resilient agriculture, restoring soil and farmer health alike. With strong policy backing and community participation, it can redefine India's path to sustainable and self-reliant farming.

INDUSTRY AND INDUSTRIAL POLICIES

INDUSTRIAL SAFETY AND WORKERS' RIGHTS IN INDIA

SOURCE: THE HINDU

Why in News?

A deadly **reactor blast at Sigachi Industries in Telangana (2025)**, along with a series of other factory accidents, has reignited debates over **weak industrial safety norms**, **poor labour enforcement**, and the **erosion of workers' rights** in India.

Reasons for Rising Industrial Accidents in India

- **Negligence and Cost-Cutting:** Many industries operate outdated machinery and skip maintenance to save costs, leading to frequent mishaps. The **ILO** highlights that such accidents usually stem from negligence and unsafe working practices rather than chance.
- **Lack of Safety Protocols and Training:** Workers are often untrained, and workplaces lack **alarms, protective gear, and emergency plans**.
- **Overwork and Fatigue:** Extended shifts and poor rest increase errors in hazardous environments.
- **Weak Law Enforcement:** Factory inspections are irregular, and many state departments suffer from staff shortages and outdated procedures.
- **Unregistered and Informal Workers:** Informal labourers, who form nearly **90% of India's workforce**, lack formal contracts, insurance, and compensation rights.
- **Insurance-Linked Malpractices:** In some cases, accidents are **manipulated to claim insurance**, masking real safety lapses.

Major Labour Laws Governing Worker Safety

- **Factories Act, 1948:** Ensures safe working conditions, proper ventilation, and machinery maintenance; amended post **Bhopal Gas Tragedy (1984)** to strengthen safety norms.
- **Workmen's Compensation Act, 1923:** Provides compensation for workplace injuries or fatalities.
- **Employees' State Insurance Act, 1948:** Offers **health insurance and cash benefits** during sickness or injury.
- **Industrial Disputes Act, 1947:** Protects against unfair dismissals and promotes peaceful dispute resolution.
- **OSHWC Code, 2020:** Merges 13 previous laws into a single framework for **safety, health, and working conditions**; however, **full implementation is still pending**.

Challenges in Ensuring Worker Protection

- **Dilution of Labour Safeguards:** Reforms under "**Ease of Doing Business**" have allowed **self-certification** and **fewer inspections**, reducing accountability.
- **Informality and Lack of Coverage:** Informal and contract workers lack legal identity, making **compensation and regulation difficult**.
- **Gender Inequality:** Women workers face unsafe workplaces, limited maternity benefits, and exclusion from formal jobs.
- **Corporate Evasion of Responsibility:** Industrial disasters often end with **minimal penalties or delayed trials**.
- **Low Productivity and Economic Losses:** Unsafe workplaces lower worker morale and efficiency, undermining **India's Viksit Bharat 2047 vision**.

Reforms Needed to Strengthen Worker Rights

- **Legal and Institutional Strengthening:** Fully enforce the **OSHWC Code, 2020** and align laws with **ILO safety conventions**.
- **Formalisation and Social Security:** Digitally register workers under **Shram Suvidha Portal** and expand **PM Shram Yogi Maan-Dhan** for pension coverage.
- **Skill and Safety Training:** Launch industry-specific safety programs under **Skill India** and **NSDC**; use **AI-based monitoring** to detect risks.
- **Gender-Inclusive Reforms:** Provide **crèches, maternity benefits**, and **skill training** to boost female participation.
- **Corporate Accountability and CSR:** Integrate **worker welfare** into **ESG and CSR obligations**.
- **Data-Driven Monitoring:** Establish a **National Dashboard** tracking compliance, accident trends, and social protection access.

Conclusion

Industrial safety is not merely a regulatory issue but a **moral and developmental priority**.

Ensuring **safe workplaces, fair wages, and social protection** is crucial for dignity and justice. A strong, accountable, and inclusive labour framework is key to realising **India's vision of equitable growth by 2047**.

INFRASTRUCTURE

INDIAN RAILWAYS' HYDROGEN AND LOW CARBON INITIATIVES

SOURCE: INDIAN EXPRESS

Why in News

In **July 2025**, Indian Railways successfully conducted a **trial of its first hydrogen-powered coach** at the **Integral Coach Factory (ICF), Chennai**, highlighting the Railways' **commitment to net-zero carbon emissions by 2030**.

Key Initiatives for a Low-Carbon Future

1. Electrification and Dedicated Freight Corridors (DFCs)

- **Track Electrification:** Nearly **45,000 km** of broad-gauge track electrified; **98% of the network now runs on electricity**.
- **Freight Optimization:** Expanding **rail freight share to 45% by 2030** through **Dedicated Freight Corridors** to reduce diesel dependence.

2. Renewable Energy Integration

- **Installed Capacity: 756 MW** of renewable capacity commissioned, including **553 MW solar, 103 MW wind, and 100 MW hybrid systems**.
- **Solar-Powered Stations:** Over **2,000 stations operate on solar energy**; several received **BEE "Shunya" net-zero certification**.

3. Hydrogen-Powered Trains

- **Heritage Initiative:** Introduction of **35 hydrogen-powered trains**, starting with the ICF trial in **July 2025**.
- **Fuel Advantage:** Hydrogen provides a **clean alternative for non-electrified routes**, reducing dependence on fossil fuels.
- **Alignment with National Policy:** Supports the **National Green Hydrogen Mission**, promoting domestic clean energy production.

4. Climate Finance Support

- **Green Bonds:** India issued **₹58,000 crore** in sovereign green bonds since FY2023, with **₹42,000 crore** directed to transport electrification.
- **International Funding:** World Bank support of **USD 245 million** under the Rail Logistics Project enhances freight efficiency.
- **IRFC Role:** Facilitates financing for renewable capacity, including a **USD 500 million green bond in 2017** and **₹7,500 crore loan to NTPC Green Energy**.

Significance of Decarbonisation

- **Environmental Impact:** Hydrogen and electrification could prevent **60 million tonnes of CO_2 annually**, equivalent to removing **13 million cars**.
- **Economic Savings:** Potential savings of over **₹1 lakh crore** in fuel costs by 2030 through energy efficiency.
- **Energy Independence:** Reduced fossil fuel imports and strengthened domestic clean energy ecosystem.
- **Public Awareness:** Daily interaction with **24 million passengers** can foster **mass climate-conscious behavior**.

Challenges

- **High Production Costs:** Green hydrogen remains expensive for large-scale adoption.
- **Operational Uncertainty:** Running costs for hydrogen trains in India are not yet fully established.
- **Limited Diesel Reduction:** Rail traction contributes only ~3% to national diesel consumption.
- **Renewable Integration:** Full decarbonisation requires sourcing electricity from renewable grids, not coal-heavy power.

Overcoming Barriers

- **Cost Reduction:** Investment in **R&D, PPPs, and indigenous technology** for green hydrogen.
- **Rolling Stock Innovations:** Expand **hydrogen fuel cell trains** on unelectrified routes.
- **Energy Efficiency:** Implement **AI-powered energy optimization, regenerative braking, and aerodynamic coaches**.
- **Public Engagement:** Introduce **green certification, carbon labeling, and awareness campaigns**.
- **Financial Support:** Leverage **green bonds, international climate funds, and Viability Gap Funding**.

Conclusion

Indian Railways' hydrogen and electrification initiatives represent a **transformative step toward sustainable mobility**. These efforts make the Railways a **pioneering**

example of India's low-carbon transition and sustainable transport vision.

TRADE AND EXTERNAL SECTOR

FOREIGN CURRENCY SETTLEMENT SYSTEM (FCSS) AT GIFT CITY

SOURCE: TIMES OF INDIA

Why in News?

Union Finance Minister **Nirmala Sitharaman** launched the **Foreign Currency Settlement System (FCSS)** at the **International Financial Services Centre (IFSC)** in **GIFT City, Gujarat**. This initiative marks a major milestone in India's efforts to **establish itself as a global financial hub** by enabling domestic settlement of foreign currency transactions.

About the FCSS

- **Objective:** To enable **faster, cheaper, and safer** settlement of inter-bank transactions in foreign currencies.
- **Regulatory Basis:** Operates under the **Payment and Settlement Systems (PSS) Act, 2007**, and is **authorised by the International Financial Services Centres Authority (IFSCA)**.
- **Technological Partner:** Software developed by **Indian Financial Technology & Allied Services (IFTAS)** — a **Reserve Bank of India subsidiary**.

Need for the FCSS

1. **Inefficient Current System:**
   - Earlier, foreign currency trades in GIFT IFSC were routed through **correspondent banking networks**.
   - Transactions passed through multiple **Nostro accounts** and intermediaries abroad.
   - Settlement took **36–48 hours**, creating delays and liquidity risks.
2. **High Operational Costs and Risks:**
   - Reliance on foreign intermediaries led to **higher charges and exposure to settlement risks**.
   - **Limited control** of Indian regulators over offshore routing increased vulnerability to external shocks.
3. **Strategic Objective:**
   - To promote **financial autonomy, reduce transaction costs**, and **strengthen India's financial sovereignty** by internalising settlements.

How the FCSS Works

- A **local settlement bank** (chosen through a transparent bidding process) will act as the **central hub**.
- All **IFSC Banking Units (IBUs)** will maintain accounts with this settlement bank.
- **Inter-bank trades in foreign currencies** (initially USD) will be **directly settled domestically**, eliminating the Nostro chain.
- In the future, the system will expand to include **Euro, Yen, Pound, and other currencies**.

Significance of FCSS

1. **Faster Settlements:** Reduces settlement time from 2 days to **real-time or near real-time**.
2. **Lower Costs:** Cuts dependency on foreign intermediaries, making **cross-border transactions cheaper**.
3. **Enhanced Liquidity:** Direct local clearing improves **liquidity management** for Indian banks.
4. **Reduced Risk:** Minimises **settlement and counterparty risks** associated with overseas networks.
5. **Global Benchmarking:** Places **GIFT City** alongside global hubs such as **Tokyo, Hong Kong, and Manila**, which have similar in-country settlement facilities.
6. **Boost to India's Global Financial Standing:** Strengthens GIFT City's role in **international trade, asset management, and fintech operations**.

About GIFT City

- **Full Form:** Gujarat International Finance Tec-City.
- **Established:** Conceptualised in **2007**, operational since **2015**.
- **India's First IFSC:** Offers a platform for global finance, insurance, and fintech operations.
- **Regulator:** The **International Financial Services Centres Authority (IFSCA)**, established in **2020**,

integrates powers of **RBI, SEBI, IRDAI, and PFRDA** within GIFT City.

Need for GIFT City

- Before GIFT City, Indian firms used **Singapore or Mauritius** for offshore financing and fund management due to friendlier regulations.
- This led to **capital outflow and regulatory leakage**.
- GIFT City aims to **"onshore offshore finance"**, providing **global-level regulatory standards** within India.

Achievements of GIFT City

- Hosts nearly **1,000 registered entities** — including banks, insurance firms, asset managers, and fintech startups.
- Home to **India's first aircraft and ship leasing units**.
- Attracted **global lessors, fund managers, and fintech innovators**, building a **self-sustaining global financial ecosystem**.

Conclusion

The launch of the **Foreign Currency Settlement System** marks a major step towards **financial self-reliance** and **global integration**. In the long term, FCSS will **enhance India's role in global capital markets** and reduce dependence on external financial systems.

PRELIMS POINTERS IN NEWS

WORLD FOOD INDIA 2025

SOURCE: PIB

Why in News?

The **World Food India (WFI) 2025**, India's flagship event on food processing, was organized to showcase India as a **"Global Food Hub."** The event concluded with **MoUs worth over ₹1 lakh crore**, reflecting huge investment, innovation, and employment opportunities in the food sector.

About World Food India

- **Conceptualized by:** Ministry of Food Processing Industries (MoFPI).
- **Editions:** First in **2017**, second in **2023**, third in **2024**, and fourth in **2025**.
- **Objectives:**
  - Highlight India's agricultural and food diversity.
  - Promote investment opportunities across the food value chain.
  - Encourage **farm-to-fork linkages** and **sustainable food systems**.
  - Support Indian brands to go global.
- It has evolved into a **global stage** showcasing India's transformation from raw produce exporter to **processed food leader**.

NEW DEVELOPMENT BANK (NDB)

SOURCE: THE HINDU

Why in News?

Pakistan has sought China's assistance to secure membership in the **New Development Bank (NDB)**, highlighting its strategic interest in BRICS-led financial mechanisms.

About New Development Bank

- The **New Development Bank**, formerly BRICS Development Bank, is a **multilateral financial institution** established by **Brazil, Russia, India, China, and South Africa**.
- Its goal is to **mobilize funds for sustainable infrastructure and development projects** in emerging economies.

Key Facts

- **Headquarters:** Shanghai, China | Regional offices: Brazil, South Africa
- **Capital:** Authorized USD 100 billion; subscribed USD 50 billion (equally divided among founding members)

- **Membership:** Open to any **UN member**; equal voting rights for all members.
- **Key Focus Areas:** Clean energy, transport infrastructure, water & sanitation, digital infrastructure, and environmental protection.
- **Governance:** Board of Governors (finance ministers of BRICS countries) and Board of Directors; **presidency rotates among members**.

Significance

- **Alternative Development Financing:** Offers an **inclusive funding platform** outside traditional institutions like the World Bank.
- **Emerging Economy Cooperation:** Strengthens **BRICS collaboration** for sustainable growth.
- **Strategic Leverage:** Countries like Pakistan seek membership to **access infrastructure financing** and deepen ties with China.

MARINE FISHERIES CENSUS 2025

SOURCE: PIB

Why in News?

The **Marine Fisheries Census 2025** has begun with digital and geo-referenced systems, following a national workshop at **CMFRI, Kochi**, to improve real-time supervision through web dashboards.

About the Census

- **Nodal Ministry:** Ministry of Fisheries, Animal Husbandry and Dairying.
- **Implemented by:** Central Marine Fisheries Research Institute (CMFRI).
- **Operational Partner:** Fishery Survey of India.
- **Launched on:** *World Fisheries Day, November 21, 2024.*
- **Slogan:** *"Smart Census, Smarter Fisheries."*
- **Funding:** 100% funded by Department of Fisheries.

Key Features

- **Coverage:** About **1.2 million fisher households** across **13 coastal States/UTs**.
- **Technology:** Digital, geo-tagged enumeration via three apps –
  - *VYAS-NAV* for validation,
  - *VYAS-BHARAT* for household data,
  - *VYAS-SUTRA* for monitoring.
- **Socio-Economic Data:** First-ever inclusion of income, liabilities, insurance, and **impact of COVID-19**.
- **Scheme Tracking:** Measures reach of **PM Matsya Sampada Yojana (PMMSY)** and **PM-MKSSY**.
- **Institutional Mapping:** Identifies Fish Farmer Producer Organisations and SHGs to support value-chain development.

Conclusion

The digital Marine Fisheries Census 2025 marks a **shift from manual to smart fisheries management**, enabling precision policy, transparency, and enhanced livelihoods for coastal communities.

INDI AND PULIYANKUDI LIMES

SOURCE: INDIAN EXPRESS

Why in News?

APEDA enabled the **first-ever air shipment** of India's **GI-tagged Indi Lime and Puliyankudi Lime** to the **United Kingdom**, boosting agri-exports of regional produce.

About Indi Lime

- **Location:** Vijayapura district, Karnataka.
- **Traits:** Thin rind, low seed count, **high juice yield**, and aromatic flavor.
- **Soil & Climate:** Cultivated in **black cotton soils** of semi-arid zones.
- **Uses:** Culinary, medicinal, and ritual purposes.
- **GI Tag:** Granted in **June 2023**, valid till 2031 — second Indian lime to be GI-tagged.

About Puliyankudi Lime

- **Location:** Tenkasi district, Tamil Nadu, at Western Ghats foothills.
- **Local Name:** *Puliyankudi Elumichai* (Kadayam variety).
- **Traits:** 55% juice yield, thin aromatic peel, high Vitamin C and antioxidants.
- **Climate:** Grown in red loamy soil and semi-arid, rain-shadow conditions.
- **GI Tag:** Received in **April 2025**; Puliyankudi is called **"Lemon City of Tamil Nadu."**

Conclusion

The export of Indi and Puliyankudi Limes reflects India's **soft-power through agri-heritage**, combining **local identity with global trade** opportunities.

NATIONAL ENERGY CONSERVATION AWARDS 2025

SOURCE: THE HINDU

Why in News?

The **Bureau of Energy Efficiency (BEE)** has invited nominations for the **35th National Energy Conservation Awards (NECA)** to be held on **December 14, 2025**, at Vigyan Bhawan, New Delhi.

About the Awards

- **Started:** 1991 by **BEE**, Ministry of Power.
- **Aim:** Recognise outstanding efforts in **energy efficiency and innovation** across sectors.
- **Frequency:** Annual, celebrated on **National Energy Conservation Day (Dec 14).**
- **New Category (2025):** *Digital Content Creators and Influencers* promoting **Mission LiFE**.

Award Categories

- **Sectors:** Industry, Transport, Buildings, Institutions, Energy-Efficient Appliances, and Innovation.
- Encourages **competitiveness** and **replication of best practices**.

About BEE

- Established on **1 March 2002** under the **Energy Conservation Act, 2001**.
- **Mission:** Reduce India's **energy intensity** via self-regulation and market-driven strategies.
- Collaborates with industries, state agencies, and consumers to promote conservation.

Conclusion

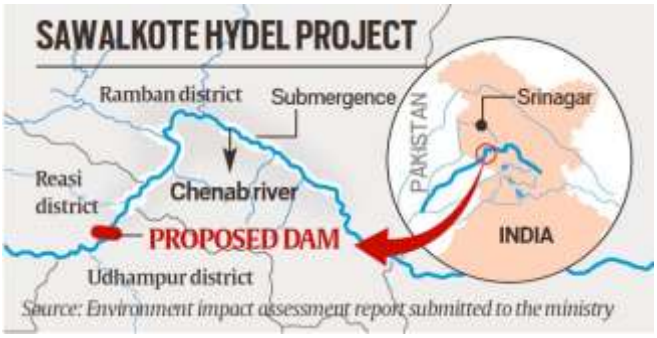
The NECA 2025 celebrates **India's energy transition leadership**, inspiring innovation and people-centric conservation aligned with **Mission LiFE**.

SAWALKOTE HYDEL PROJECT

SOURCE: THE HINDU

Why in News?

The Government has granted **environmental clearance** for the **1,856-MW Sawalkote Hydroelectric Project** on the **Chenab River** in Jammu & Kashmir.



Project Overview

- **Location:** Ramban district, Jammu & Kashmir.
- **River:** Chenab.
- **Implementing Agency: NHPC Limited**.
- **Capacity:** 1,856 MW (Stage I – 1,406 MW; Stage II – 450 MW).

- **Dam Type:** Concrete gravity dam, 530 million m³ reservoir over ~1,159 hectares.
- **Classification:** Run-of-river project with moderate storage.

Significance

- Will be **J&K's largest hydropower project**.
- Enhances **energy security**, creates local jobs, and reduces regional power deficit.
- Supports India's **non-fossil electricity target** under *Panchamrit*.
- Part of the Chenab cascade with **Dulhasti, Baglihar, Salal, and Ratle** HEPs.

Conclusion

The Sawalkote Project strengthens India's **clean-energy capacity** and regional development, provided ecological safeguards are strictly maintained.

ELECTRONIC BANK GUARANTEES (E-BGS)

SOURCE: TIMES OF INDIA

Why in News?

During the **Global Fintech Fest 2025**, the **National e-Governance Division (NeGD)** and **NeSL** signed an MoU to link **Entity Locker** with the **Digital Document Execution platform** for issuing e-Bank Guarantees.

About e-BGs

- **Concept:** Fully digital replacement of paper-based Bank Guarantees.
- **Implemented by:** *Ministry of Electronics & IT* and *Ministry of Finance*.
- **Partners:** NeGD (under MeitY) and **National e-Governance Services Ltd (NeSL)**.
- **Time Efficiency:** Reduces issuance time from 3–4 days to **minutes**.
- **Legal Validity:** Uses **e-stamp** and **e-signature** under the IT Act.

Working Mechanism

- **Integration:** Entity Locker (like DigiLocker) linked with NeSL's **Digital Document Execution (DDE)**.
- **Workflow:** Banks issue, amend, renew, or invoke e-BGs digitally; stored in NeSL's repository.
- **Security:** Tamper-proof digital PDF accessible to both applicant and beneficiary.

Key Advantages

- Instant issuance, 24×7 availability.
- Streamlined **stamp duty** and **paperless compliance**.
- Minimises fraud risk and **enhances transparency** in trade finance.

Conclusion

The e-BG system signifies a major stride toward **Digital Governance in Finance**, promoting efficiency, trust, and cost-effective digital infrastructure in India's banking ecosystem.

URBAN LOCAL BODIES' FISCAL ARCHITECTURE IN INDIA

Why in News?

Urban India contributes nearly **two-thirds of India's GDP**, but its **municipalities control less than 1% of national tax revenue**, highlighting the urgent need to **reform the fiscal architecture of Urban Local Bodies (ULBs)** for financial empowerment.

Structural Issues Undermining Municipal Fiscal Effectiveness

1. **Over-reliance on Grants and Schemes:** Municipal finances are largely dependent on **State and Central government transfers**, many of which are **discretionary or delayed**, affecting planning and execution.

2. **Impact of GST**: The **Goods and Services Tax (2017)** subsumed key local taxes like **octroi and entry tax**, causing an estimated **19% revenue loss** and reducing municipal fiscal autonomy.
3. **Unequal Functional-Resource Match**: Cities are responsible for **critical services** but lack adequate **financial tools**, resulting in what experts call an "**inversion of democracy**."
4. **Weak Fiscal Capacity**: Limited capacity prevents municipalities from **investing in infrastructure** or meeting **sustainability goals**.
5. **Creditworthiness Constraints**: Credit ratings focus on **own revenue** (e.g., property tax) and often ignore **regular state/central transfers**, restricting access to borrowing.
6. **Political Hesitation**: Local representatives are often reluctant to **introduce new taxes** due to fear of voter backlash.
7. **Institutional Weaknesses**: Lack of **trained staff**, fragmented governance, and poor **data systems** hinder effective fiscal management.

Urban Local Bodies (ULBs) and Legal Framework

- **74th Constitutional Amendment (1992)** gave **constitutional status to ULBs** under **Part IXA (Articles 243P–243ZG)**.
- ULBs include **Nagar Panchayats, Municipal Councils, and Municipal Corporations**.
- The **12th Schedule** lists key functions: urban planning, water supply, sanitation, solid waste management, and social services.
- Mandates include **regular elections, reservation for weaker sections**, and oversight by a **State Election Commission**.

Sources of Municipal Revenue

- **Own Revenue**: Property tax, user charges, trade licenses, parking fees, advertisement tax, development charges.
- **Transfers from Higher Governments**: Grants via **State and Central Finance Commissions**, revenue-sharing arrangements, schemes like **AMRUT** and **Smart Cities Mission**.
- **Borrowings & Municipal Bonds**: Cities such as **Ahmedabad, Pune, Surat, Hyderabad, and Lucknow** have raised funds through **municipal bonds**.
- **Public-Private Partnerships (PPP)**: Infrastructure and asset monetisation with **private sector participation**.

Need for Reform

- **Mismatch Between Functions and Funds**: Devolution of responsibilities has **not been matched with fiscal powers**, limiting service delivery.
- **Rising Urbanisation**: Growing **population and migration** increases pressure on ULBs to provide **housing, infrastructure, and services**.
- **Limited Access to Innovative Financing**: Municipalities often lack frameworks to use **bonds, PPPs, and land-based financing** for large projects.

Steps Taken to Strengthen Urban Fiscal Governance

- **AMRUT 2.0**: Incentives for **municipal bonds issuance**.
- **SASCI Scheme 2023–24**: ₹3,298.23 crore released to states for **property tax reforms and municipal bond creditworthiness**.
- **Finance Commission Recommendations**: GIS mapping for property tax, enabling **vacant land tax**, and promoting revenue efficiency.
- **Smart Cities and Swachh Bharat Missions**: Encourage **user charges and revenue generation**.
- **Digital Reforms**: Online tax payment, e-filing, and transparent accounting.

Proposed Reforms to Strengthen Fiscal Architecture

1. **Recognise Grants and Shared Taxes** as stable municipal revenue.
2. **Revise Credit Rating Norms** to include governance quality and fiscal management.
3. **Use GST Compensation as Collateral** for municipal borrowing.
4. **Strengthen Property Tax Systems** through GIS mapping, revaluation, and efficient collection.
5. **Promote Cooperative Federalism**: predictable, formula-based transfers for fiscal autonomy.
6. **Leverage Innovative Financing**: Social Stock Exchanges, Value Capture Financing for urban projects.

Conclusion

A **robust fiscal framework** is essential to empower municipalities to deliver **quality urban services** and promote **sustainable, inclusive cities**. Reforming ULB finance will strengthen **accountability, resilience, and financial independence**, enabling India to achieve **SDG 11: Sustainable Cities and Communities**. Well-governed, financially strong cities are key to supporting **economic growth and citizen welfare** in the urban century.

HISTORY

PRELIMS POINTERS IN NEWS

KARNAK TEMPLE

SOURCE: THE HINDU

Why in News?

A recent **geoarchaeological study** has revealed how the **Karnak Temple complex** in Egypt emerged from an island amid **Nile floods** and evolved into a major sacred site of the ancient world.

About Karnak Temple:

- **Location:** Karnak, Luxor Governorate, **east bank of the Nile**, south Egypt.
- **Timeline:** Construction spanned **2055 BCE to ~100 AD**, covering the **Middle Kingdom to Greco-Roman periods**.
- **Dedicated To:** Gods **Amun, Mut, and Khonsu**.
- **Significance:** Largest religious building complex in ancient Egypt, considered "**most select of places**" by Egyptians.

Historical Contributions:

- **New Kingdom Pharaohs:** Hatshepsut, Tuthmose III, Seti I, and Ramesses II added monumental structures.
- **Later Influence:** Ptolemies, Romans, and early Christians contributed **architectural modifications**.
- **UNESCO Status:** Part of the **Thebes UNESCO World Heritage Site**, along with Luxor Temple and Valley of the Kings.

Architectural Highlights:

- Massive **hypostyle halls, pylons, obelisks, and sacred lakes**.
- Served as **political, religious, and ceremonial center**, showcasing Egypt's **artistic and engineering excellence**.
- Continuous construction reflects **religious devotion and dynastic prestige**.

Cultural & Archaeological Significance:

- Central to the **ancient Egyptian religious system**.
- Study of floods and temple location provides insights into **ancient urban planning and water management**.
- Offers lessons for **heritage preservation in flood-prone areas**.

VIRTUAL MUSEUM OF STOLEN CULTURAL OBJECTS

SOURCE: THE HINDU

Why in News?

UNESCO launched the **Virtual Museum of Stolen Cultural Objects** at MONDIACULT 2025 to digitally reconnect communities with looted heritage and support recovery efforts. The platform currently displays nearly **240 missing objects from 46 countries**, including two 9th-century sculptures from Chhattisgarh.

Objectives and Features

- **Awareness & Education:** Uses immersive displays and narratives to show the cultural, spiritual and historical value of stolen items.
- **Global Coverage:** Aggregates artefacts from multiple countries, enabling cross-border comparisons and collaborative investigations.
- **Community Reconnection:** Reunites displaced communities with virtual representations of objects (e.g., the **Nataraja** and **Brahma** sculptures from Pali, Chhattisgarh).

- **Partnerships:** Developed with **INTERPOL** and supported financially by the Kingdom of Saudi Arabia, it links law-enforcement leads with cultural expertise.
- **Searchable Database:** Includes high-resolution imagery, descriptions, last-known provenance and reported theft details to help museums, collectors and investigators.
- **Restitution Aid:** Serves as a non-judicial tool to build public pressure and evidence for diplomatic or legal recovery processes.

Significance

- Strengthens **preventive diplomacy** and public engagement against illicit trafficking.
- Helps fill gaps where physical repatriation is slow or legally complex.
- Encourages transparent **museum practices** and due diligence in acquisitions.

SABARIMALA TEMPLE – KERALA

SOURCE: THE HINDU

Why in News?

President **Droupadi Murmu recently visited the Sabarimala Temple**, becoming the first woman head of state to offer prayers at this iconic hilltop shrine.

Sabarimala Temple, located in **Pathanamthitta district, Kerala**, is dedicated to **Lord Ayyappa (Dharma Shasta)**, the son of **Shiva and Mohini (Vishnu's feminine form)**. It is one of the **largest pilgrimage centers in the world**, attracting millions of devotees annually.

Key Features

- **Location:** Western Ghats, altitude 4,134 ft; surrounded by forests of the **Periyar Tiger Reserve**.
- **Pilgrimage Season:** Mandalam-Makaravilakku; 40–50 million pilgrims annually.
- **Rituals:** Pilgrims observe a **41-day vratham (austerity period)** before visiting.
- **Religious Harmony:** Includes **Vavaru Nada**, dedicated to Vavar, a Sufi companion of Lord Ayyappa.

Architecture

- Blend of **Kerala and Dravidian styles**.
- Sanctum sanctorum with **copper-plated roof and four golden finials**.
- Features **two mandapams, a flagstaff**, and the **18 sacred steps** leading to the sanctum.

Sabarimala Case

- Historically, **women aged 10–50 were prohibited** from entry.
- In 2018, the **Supreme Court ruled this restriction unconstitutional**, triggering protests.
- The matter is under review by a **larger bench**.

Significance

- Represents **religious devotion and cultural heritage**.
- Encourages **gender equality debate in traditional practices**.
- Promotes **pilgrimage tourism and local economy**.

GEOGRAPHY

PRELIMS POINTERS IN NEWS

PULICAT LAKE

SOURCE: INDIAN EXPRESS

Why in News?

Fishermen at Pulicat Lake have demanded long-term measures to tackle **siltation**, which threatens their **livelihoods and the lake's biodiversity**.

Key Features

- **Geography**: A **coastal lagoon** along the **Bay of Bengal**, separated by **Sriharikota Island** (home to ISRO's launch site).
- **Area**: Spread across **750 sq. km**, depending on seasonal inflow.
- **Rivers Feeding It**: **Aarani** (south) and **Kalangi** (northwest); traversed by the **Buckingham Canal**.
- **Designation**: Declared a **Ramsar Site** in **2002** for its ecological importance.

Biodiversity

- **Flora**: Around **130+ plant species** including **Excoecaria agallocha** and **Calamus viminalis**.
- **Fauna**: Home to **mudskippers, crabs, oysters, and seagrasses**.
- **Avifauna**: Hosts **200+ migratory bird species** such as **flamingos, sand plovers, oystercatchers**, and **godwits**.

Issues

- **Siltation** reduces water depth and affects fish breeding.
- **Pollution and encroachment** threaten the lagoon ecosystem.
- **Shrinking livelihood** opportunities for local fishers.

BARATANG ISLAND AND MUD VOLCANO

SOURCE: THE HINDU

Why in News?

The **Baratang Island** in the **Andaman and Nicobar Islands** has witnessed another eruption of **India's only active mud volcano**, reviving geological interest in the region.

Geographical Overview

- **Location:** Around **150 km north of Port Blair**, within the **Andaman Islands**.
- **Surroundings:** Lies between **Middle and South Andaman Islands**, connected by ferry across the Jarawa Reserve.
- **Significance:** Hosts **India's only known mud volcanoes**, which erupted previously in **2005** after an earthquake.

About Mud Volcanoes

- **Formation:** Created when **mud, gas, and water** erupt through geological cracks due to underground pressure.
- **Composition:** Emits **methane**, **carbon dioxide**, and **nitrogen** gases, mixed with **mud slurry**.

- **Difference from Lava Volcanoes:** Do not release **molten lava**, only **mud and gas**.
- **Size:** Can range from a few meters to **700 meters high** and several kilometers wide.
- **Underwater Occurrence:** Some mud volcanoes exist **under the sea**, altering the **seafloor topography**.

Ecological and Cultural Importance

- **Jarawa Tribe Habitat:** The island is home to the **Jarawa tribe**, one of the last remaining **indigenous tribes** of the Andaman Islands.
- **Tourism:** Famous for **limestone caves**, **mangrove creeks**, and **volcanic sites**.
- **Research Value:** Offers insights into **subsurface gas dynamics** and **earthquake activities**.

Scientific Relevance

- Acts as a **natural vent** for releasing **geothermal pressure**.
- Indicates **tectonic activity** related to the **Indian and Burmese plate interaction**.
- Helps scientists study **seismic precursors** and **methane emissions** contributing to **climate studies**.

MAR DEL PLATA CANYON

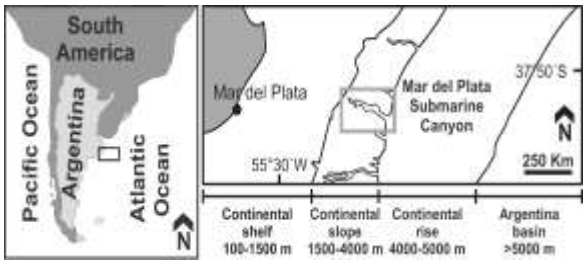
SOURCE: INDIAN EXPRESS

Why in News?

A recent deep-sea expedition in Argentina's **Mar del Plata Canyon** uncovered **over 40 possible new marine species**, including glass squids and pink lobsters, revealing the canyon's rich biodiversity.

Location and Geography

- Lies **250–300 km offshore** from the city of Mar del Plata.
- Positioned on the **Argentine continental margin**.
- Characterised by **fine sand mixed with terrigenous material** and **planktonic foraminifera**.
- The canyon's environment is shaped by the **Argentine Shelf-break Front**, where warm subantarctic waters meet cold **Falkland-Malvinas Current**.



Ecological Significance

- The canyon supports **high marine productivity** due to nutrient mixing at the thermohaline front.
- Acts as a **feeding and spawning ground** for numerous fish and invertebrates.
- The recent discovery of new species highlights its **ecological richness** and importance for **marine conservation**.

Submarine Canyons: Overview

- Submarine canyons are **steep, narrow underwater valleys** cut into **continental slopes** and **rises**.
- They resemble **river canyons on land** but are much deeper and longer.
- Most measure **less than 50 km**, but some extend **beyond 300 km**.
- Serve as **sediment transport pathways**, carrying nutrients and organic carbon to **deep ocean basins**.
- Form **submarine fans**, similar to river deltas, at their ends.

Scientific Importance

- Offer insight into **sediment movement**, **marine geology**, and **climate processes**.
- Host **unique ecosystems** adapted to high pressure and darkness.
- Help scientists understand **continental shelf dynamics** and **deep-sea biodiversity**.

MIG LA PASS

SOURCE: THE HINDU

Why in News?

The **Border Roads Organisation's Project Himank** constructed the **world's highest motorable road** at **Mig La Pass**, Ladakh, at 19,400 feet.

About Mig La Pass:

- **Location:** Changthang Plateau, Ladakh.
- **Altitude:** 19,400 ft – **highest all-weather motorable road globally**.

- **Strategic Importance:** Connects **Likaru–Mig La–Fukche**, forming a third axis from Hanle to Fukche near the **Indo-China border**.

Project Himank:

- Established **4 December 1985** to enhance **road communication in high-altitude Ladakh**.
- Maintains roads, clears **landslides and avalanches**, constructs **bridges**, and keeps **airfields operational**.
- Supported **Indian Army operations**, including **Op VIJAY**.
- Roads designed to withstand **extreme cold, glaciers, and oxygen-deficient air**.

Engineering and Features:

- **All-weather design** suitable for harsh winters.
- Implements **advanced materials and construction techniques** for durability.
- Enhances **strategic mobility and regional connectivity** in remote areas.

Significance:

- Boosts **border preparedness and national security**.
- Encourages **tourism and economic activity** in high-altitude regions.
- Demonstrates India's **engineering capabilities in extreme environments**.

EASTER ISLAND & MOAI STATUES

SOURCE: THE HINDU

Why in News?

New research reveals that the **iconic Moai statues** of **Easter Island** were likely "**walked upright**" using innovative engineering, rather than being dragged or rolled.

About Easter Island:

- **Location:** Polynesian island in the **southeastern Pacific Ocean**, ~3,540 km from Chile.
- **Area:** 163.6 sq. km; triangular volcanic island with **three extinct volcanoes**: Terevaka, Poike, and Rano Kau.
- **Climate:** Tropical rainforest.
- **UNESCO World Heritage Site:** Named in **1996**; Rapa Nui National Park protects major areas.

Moai Statues:

- **Number:** Over **900 statues** discovered.
- **Features:** Large human heads, some with **pukao (hat-like top)**; tallest up to **40 feet** and **75 tonnes**.
- **Purpose:** Built to **honor ancestors or chieftains**, placed on **ahu** (stone platforms serving as tombs).
- **Construction Era:** 13th–16th century.
- **Movement:** Likely **walked upright**, balancing the statues, rather than dragged.

Cultural Significance:

- Represent **ancestral reverence** and social hierarchy.
- Reflect advanced **engineering and societal organization** of the Rapa Nui people.
- Important for **archaeology, anthropology, and tourism**.

CAMPI FLEGREI VOLCANO

SOURCE: THE HINDU

Why in News?

An **AI geophysical study** has revealed previously unseen structures at **Campi Flegrei**, including a pronounced **ring fault** that could trigger magnitude-5 earthquakes, renewing concern about the caldera's unrest.

About Campi Flegrei

- Campi Flegrei is a large, active volcanic caldera west of Naples. Unlike a single cone, it is a complex volcanic system with hydrothermal activity and episodic ground inflation, posing a risk to densely populated areas nearby.

Key Facts

- **Nature of the System:** A broad **caldera** spanning roughly **12–15 km**, formed by major prehistoric eruptions.

- **Recent Activity:** Signs of unrest since 2005 — ground uplift, seismic swarms and hydrothermal changes — monitored by geophysical networks.
- **Population Risk:** The Bay of Naples and surrounding towns host large populations and critical infrastructure, heightening hazard potential.

New Findings & Implications

- **Ring Fault Discovery:** AI models detected a clear **ring fault** structure that could localise seismic rupture and increase earthquake hazard.
- **Earthquake Potential:** Fault activity could generate **magnitude ~5 quakes**, amplifying damage in urban areas already vulnerable to secondary hazards.
- **Monitoring Importance:** Advanced imaging improves eruption forecasting and emergency planning, enabling targeted mitigation.

Hazard Management

- **Multi-parameter Monitoring:** Continued GPS, InSAR, gas emission and seismic monitoring is essential.
- **Risk Mapping & Evacuation Plans:** Scenario-based contingency planning for communities and infrastructure.
- **Public Communication:** Clear risk communication and evacuation drills reduce panic and casualties.

GOMTI RIVER

SOURCE: INDIAN EXPRESS

Why in News?

Uttar Pradesh launched the **Gomti Rejuvenation Mission** to intercept **95% of urban sewage** entering the river, aiming to restore flow, water quality and riverine ecology.

About Gomti River

- The **Gomti**, a perennial tributary of the Ganges flowing entirely within Uttar Pradesh, sustains agriculture, towns and ecosystems across its ~900 km course. Decades of pollution and encroachment have degraded its health and services.

Physical & Basin Traits

- **Origin & Course:** Rises from **Gomat Taal** in Pilibhit district and traverses cities like **Lucknow, Sultanpur and Jaunpur** before joining the Ganga.
- **Basin Geology:** Underlain by **Quaternary alluvium**—a mix of sand, silt, clay and kankar—affecting groundwater recharge and river-bank behaviour.
- **Hydrology:** Largely **perennial** but with reduced base flows and high seasonal variability during monsoon.

Drivers of Degradation

- **Urban Sewage:** Untreated domestic wastewater is the chief pollutant, especially from Lucknow and other towns.
- **Industrial Effluents & Solid Waste:** Local industries and dumping increase chemical and biological loads.
- **Encroachment & Riverfront Alteration:** Unplanned development reduces floodplain function and habitat.
- **Groundwater Extraction:** Alters baseflow dynamics and reduces dilution capacity.

Gomti Rejuvenation Mission – Key Measures

- **Sewage Interception:** Targeting **95% interception** through sewage networks and treatment plants.
- **Riverfront Development:** Eco-sensitive riverfront works to restore riparian zones and public access.
- **Wetland & Floodplain Restoration:** Rehabilitating natural buffers to improve filtration and biodiversity.
- **Community & Institutional Action:** Strengthening municipal capacity, pollution monitoring and citizen engagement.

Challenges

- **Financial & Technical Capacity:** Large capital needs for sewerage infrastructure and O&M.
- **Coordination:** Multiple agencies (state, municipal, CPCB) require seamless collaboration.
- **Behavioral Change:** Reducing domestic pollution requires public awareness and enforcement.

CHRYSANTHEMUM GARDEN IN KASHMIR

SOURCE: THE HINDU

Why in News?

Kashmir recently opened its **first Chrysanthemum garden** for tourists, marking a significant development in horticulture and promoting **agrotourism** in the region.

Chrysanthemums are **perennial flowering plants** from the **Asteraceae family**, native to **Asia and northeastern Europe**. Known for their **bright autumn blooms**, they are valued for both **ornamental and medicinal purposes**.

Botanical Features

- Height: 50–150 cm, with **deeply lobed leaves**.
- Flower colors: White, yellow, pink.
- Bloom season: **Autumn**.
- Lifespan: **Perennial herbaceous plant**.

Climatic and Soil Requirements

- **Temperature:** 20–28°C during day, 15–20°C at night.
- **Soil:** Well-drained red loamy soil with pH 6–7.
- **Climate:** Subtropical to temperate regions.

Uses

- **Medicinal:** Treats **hypertension, fevers, headaches, and inflammation**.
- **Ornamental:** Garden decoration and landscape enhancement.
- **Cultural significance:** Often used in festivals and floral arrangements.

Significance of the Garden

- Boosts **tourism and local economy** in Kashmir.
- Promotes **horticulture and agricultural innovation**.
- Encourages **environmental awareness** and appreciation for biodiversity.

MOUNT ETNA

SOURCE: THE HINDU

Why in News?

Recent studies analyzing **earthquake patterns under Mount Etna** have revealed a strong correlation with the volcano's activity over the past 20 years, providing insights into eruption prediction.

Mount Etna is an **active stratovolcano** located on **Sicily, Italy**, lying above the convergent plate boundary between the **African Plate and Eurasian Plate**. It is **Europe's tallest active volcano** and one of the **most monitored volcanic systems globally**.

Key Facts

- **Height:** Approximately 3,350 meters (11,000 ft).
- **Area Covered:** 1,190 sq.km with a basal circumference of 140 km.
- **Eruption History:** Traced back 500,000 years, with **2,700 years of documented eruptions**.
- **UNESCO World Heritage Site:** Recognized for its **unique volcanic landscape and biodiversity**.

Geological Significance

- Lies at the **convergent boundary**, causing magma rise and frequent eruptions.
- The ratio of **small to large earthquakes** can indicate magma movement and eruption likelihood.

Hazards & Impacts

- **Lava flows and ash fall:** Threaten settlements and agriculture.
- **Seismic activity:** Can damage infrastructure and trigger landslides.
- **Air quality:** Volcanic gases affect local and regional environments.

Monitoring & Research

- Continuous **seismic monitoring, gas analysis, and satellite observation**.
- Helps in **early warning systems** to minimize human and economic losses.

ENVIRONMENT

BIODIVERSITY AND CONSERVATION

COLD DESERT BIOSPHERE RESERVE (CDBR)

SOURCE: THE HINDU

Why in News?

The **Cold Desert Biosphere Reserve (CDBR)** in Himachal Pradesh has been added to the **World Network of Biosphere Reserves (WNBR)** by UNESCO.

Key Facts about the Cold Desert Biosphere Reserve

- **Location**: Situated in Himachal Pradesh's **Trans-Himalayan region**, covering the **entire Spiti Wildlife Division** and adjoining **Lahaul Forest Division** including **Baralacha Pass, Bharatpur, and Sarchu** (altitude 3,300–6,600 m).
- **History**: Declared as a **Biosphere Reserve in 2009**, becoming **India's 16th** and first **high-altitude cold desert biosphere reserve**.
- **Landscape**: Encompasses **Pin Valley National Park, Kibber Wildlife Sanctuary, Chandratal Wetland**, and features **glacial valleys, alpine lakes, windswept plateaus, and high-altitude deserts**.
- **Flora**:
  - Contains **14 endemic, 68 native, and 62 threatened plant species**.
  - Notable species: **Himalayan birch, Willow-leaved sea-buckthorn, Persian juniper, Salix spp., Betula utilis**.
- **Fauna**:
  - Habitat of **snow leopard, Himalayan wolf, Tibetan antelope, Himalayan ibex, red fox, Himalayan griffon, bearded vulture, and Tibetan gazelle**.
  - Represents a **critical refuge for rare and endangered Trans-Himalayan wildlife**.

World Network of Biosphere Reserves (WNBR)

- **About**: A global network of sites of excellence that demonstrates a **balanced relationship between humans and nature**.
- **Objective**: Promotes **North-South and South-South cooperation**, knowledge-sharing, and sustainable management practices.
- **UNESCO Affiliation**: Functions under the **Man and the Biosphere (MAB) Programme**.
- **Global Presence**: Now includes **785 sites across 142 countries**, covering over **1 million sq km** of additional protected land since 2018.

About Biosphere Reserves

Definition: International designation for **significant natural and cultural landscapes** ensuring **in situ conservation** along with socio-economic development.

Three Functions:

1. **Conservation** – safeguarding biodiversity and cultural heritage.
2. **Development** – encouraging eco-friendly livelihoods.
3. **Logistic Support** – enabling **research, education, and training**.

Structure:

- **Core Zone**: Strictly protected natural ecosystem.
- **Buffer Zone**: Permits **research, monitoring, eco-tourism**.
- **Transition Zone**: Area for **sustainable resource use by communities**.
- **Criteria for Designation**: Must include **minimally disturbed core areas**, viable population sizes,

community involvement, and **integration of traditional knowledge**.

Significance of Cold Desert's Inclusion in WNBR

- **Ecological Importance**: Protects fragile **high-altitude cold desert ecosystems** vulnerable to climate change.
- **Cultural Value**: Supports **local tribal communities and traditional practices**.
- **Global Cooperation**: Enhances **knowledge exchange, eco-tourism opportunities, and sustainable management models**.
- **Recognition**: Reinforces India's commitment to **conservation, biodiversity protection, and sustainable development**.

Conclusion

The **Cold Desert Biosphere Reserve** is a unique high-altitude ecosystem showcasing the coexistence of humans and nature. Its recognition under UNESCO's **World Network of Biosphere Reserves** strengthens India's role in **global biodiversity conservation**. Sustained management, local community participation, and scientific research will ensure that this **fragile ecosystem thrives while supporting sustainable livelihoods**.

TROPICAL FORESTS IN NORTHEASTERN AUSTRALIA ACT AS CARBON SINK

SOURCE: THE GUARDIAN

Why in News?

A recent **study published in Nature** has revealed that **tropical forests in northeastern Australia** are the first globally to change from being a **carbon sink to a net carbon source**, primarily due to increased **tree mortality caused by climate stressors** such as cyclones, drought, and heat.

What is a Carbon Sink?

- **Definition:** A carbon sink is any system that **absorbs more carbon from the atmosphere than it emits**, storing it in vegetation, soil, or oceans.
- **Key Examples:**
  1. **Forests:** Trees absorb CO_2 through **photosynthesis**, storing carbon in wood, leaves, roots, and soil.
  2. **Oceans:** The largest active carbon sink, absorbing CO_2 directly from the atmosphere; **phytoplankton** use it for photosynthesis.
  3. **Soil and Peatlands:** Contain carbon stored in **organic matter** from decomposed plants and animals.

What is a Carbon Source?

A carbon source is anything that **releases more carbon than it absorbs**, increasing atmospheric CO_2.

- **Natural Sources:**
  - **Respiration:** Animals, plants, microbes release CO_2.
  - **Wildfires & Volcanic Eruptions:** Release stored carbon and methane.
  - **Soil Decomposition & Ocean Release:** Microbial activity and warming oceans emit CO_2.
- **Human-Induced Sources:**
  - **Fossil Fuel Combustion:** Coal, oil, gas burning for energy.
  - **Deforestation & Land-Use Change:** Reduces absorption and releases stored carbon.
  - **Industrial Processes & Agriculture:** Cement, steel, livestock, fertilizers contribute CO_2, CH_4, and N_2O.
  - **Waste Management:** Landfills and incineration release greenhouse gases.

Consequences of Forests Turning into Carbon Sources

- **Vicious Feedback Loop**: Tree mortality increases carbon release, worsening **climate change**, and triggering more fires and droughts.
- **Social and Cultural Impacts**: Indigenous communities dependent on forests face **livelihood loss, food insecurity, cultural threats**, and potential displacement.
- **Ecosystem Collapse**: Biodiversity loss and increased **extinction risk** as native species cannot survive in degraded or warming habitats.
- **Impacts on Human Systems**: Water insecurity, reduced agricultural productivity, economic losses, and public health risks.

Measures Needed for Mitigation

- **Aggressive Global Emission Cuts**: Reduce **fossil fuel emissions rapidly** and implement enhanced carbon budgets under the **Paris Agreement**.
- **Proactive Forest Management**: **Assisted species migration, controlled burns, pest management** to prevent forest dieback.

- **Climate-Adaptive Policies**: Promote **drought-resistant crops, water-efficient irrigation**, and diversify rural livelihoods.
- **Empowerment of Local Communities**: Integrate **Indigenous knowledge**, secure **land tenure**, and involve communities in sustainable forest governance.

Conclusion

The shift of northeastern Australian forests from **carbon sinks to sources** marks a **critical climate tipping point**, creating a self-reinforcing loop of warming and forest degradation. **Immediate action** is needed through **emission reductions, adaptive forest management, and community participation**. Protecting and restoring forests is essential to maintain **global carbon balance and ecological stability**.

POLLUTION

CARBON CAPTURE, USAGE AND STORAGE (CCUS) IN ASIA AND INDIA

SOURCE: THE HINDU

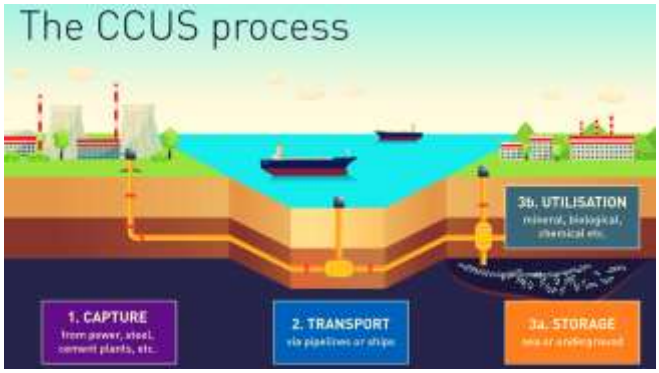
Why in News?

A recent **Climate Analytics (2025) report** warns that Asia's growing dependence on **Carbon Capture, Usage and Storage (CCUS)** could lead to an additional **25 billion tonnes of CO_2 emissions by 2050**, as many projects are being used to **prolong fossil fuel use** instead of cutting emissions.

What is CCUS?

CCUS is a group of technologies designed to **capture carbon dioxide (CO_2)** from power plants, industries, or directly from the air, and then **reuse or store** it safely underground.

- **Stages of CCUS:**
  1. **Capture:** Extract CO_2 using post-combustion, pre-combustion, or oxy-fuel methods.
  2. **Transport:** Move compressed CO_2 via **pipelines, ships, or trucks**.
  3. **Storage/Use:** Inject CO_2 into **deep geological formations** like depleted oil fields or use it to create industrial products.
- **Applications:**
  - Reduces emissions in sectors like **cement, steel, and chemicals**.
  - Helps in **low-carbon hydrogen** production.
  - Used in **Bioenergy with CCS (BECCS)** and **Direct Air Capture (DACCS)** to remove existing CO_2 from the air.



Why Asia's Rising CCUS Dependence is Concerning

- **Excess Emissions:** Asia's projected CCUS strategy could cause **24.9 gigatonnes of extra CO_2 emissions by 2050**, derailing the **1.5°C global temperature goal**.
- **Energy Lock-In:** Heavy CCUS investments could **lock nations into fossil fuel infrastructure**, discouraging renewable adoption.
- **Economic Burden:** High capital and maintenance costs could divert funds from **solar, wind, and green hydrogen**.
- **Air Pollution Continuation:** CCUS doesn't tackle **NOx and SOx** emissions, worsening air quality.
- **Policy Misuse:** Governments often promote CCUS as a **cover for continued fossil fuel dependence**, instead of transitioning to clean energy.

India's Status and Initiatives in CCUS

- **Limited Infrastructure:** India has **no large-scale CCUS plants or storage networks**, though pilot projects exist.
- **Cement Sector Testbeds:** India's first **CCU test cluster** includes five cement projects focusing on:
  - Carbon mineralisation,
  - Oxygen-enhanced calcination, and
  - Vacuum swing adsorption.
- **National Centres of Excellence:**
  - **IIT Bombay (NCoE-CCU)**
  - **JNCASR Bengaluru (NCCCU)** are leading CCUS R&D efforts supported by the **Department of Science & Technology**.
- **Renewable Progress:** With rapid strides in **solar, wind, EVs, and green hydrogen**, India can achieve decarbonisation with **less reliance on CCUS**.

Key Concerns with CCUS

- **Low Capture Efficiency:** Most projects capture only **50–60% of CO_2**, far below the desired **95%** rate.

- **Enhanced Oil Recovery (EOR):** Around **80% of global CCS projects** use captured CO_2 to extract more oil, worsening fossil dependency.
- **High Cost:** Power generation with CCS can be **twice as costly** as renewable-based systems.
- **Sectoral Misalignment:** Focus is on fossil sectors, while **cement and steel**—true hard-to-abate industries—receive less support.
- **Risk of CO_2 Leakage:** Stored carbon can **leak from geological formations**, harming ecosystems.
- **Cheaper Alternatives Exist:** Renewables and green hydrogen are already **more cost-effective** and scalable.

Way Forward

- **Selective Adoption:** Use CCUS **only for hard-to-abate industries** like steel and cement.
- **Pilot Before Expansion:** Test smaller, **high-efficiency** projects before large-scale rollouts.
- **Develop a Storage Atlas:** Agencies like **ONGC and GSI** should identify suitable **geological storage sites** (e.g., Bombay High).
- **Technology Partnerships:** Engage with **developed nations** for tech transfer, R&D, and finance under climate cooperation frameworks.
- **Integrate with Renewables:** Combine **CCUS with green hydrogen and renewable energy** to create hybrid decarbonisation systems.

Conclusion

Asia's overdependence on CCUS risks **locking economies into fossil fuel use** and overshooting climate targets. For India, **renewables, energy efficiency, and hydrogen** provide a cleaner and cheaper route to decarbonisation. CCUS should remain a **complementary—not central—tool** in India's transition to a net-zero future.

CARBON FERTILISATION EFFECT

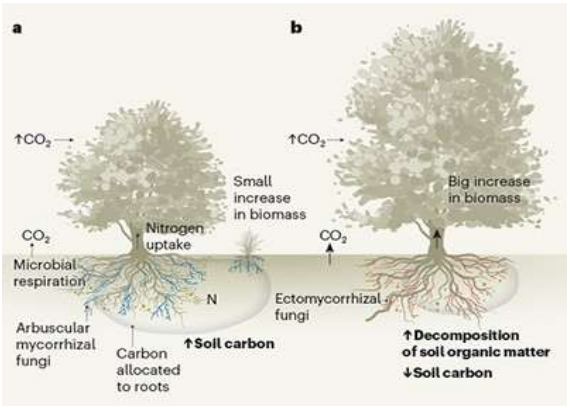
SOURCE: THE HINDU

Why in News?

A recent *Nature* study highlights that **trees in the Amazon rainforest are growing bigger due to rising CO2 levels**, showing the **carbon fertilisation effect**, which may temporarily help in carbon storage and mitigating climate change.

About Carbon Fertilisation Effect (CFE)

The **carbon fertilisation effect (CFE)** refers to the enhanced growth of plants and trees when exposed to higher levels of atmospheric carbon dioxide (CO_2). Since CO_2 is the main input for photosynthesis, increased concentration can boost plant productivity.



Key Features

- **Boosts Photosynthesis**: More CO_2 allows plants to produce additional glucose, encouraging faster growth and higher biomass.
- **Improves Water Efficiency**: Plants may use less water per unit of carbon absorbed, crucial in dry areas.
- **Observed in Nature & Greenhouses**: Seen in tropical forests like the Amazon and in artificial settings like horticultural greenhouses.
- **Limitations**: Growth benefits depend on adequate **nutrients (especially nitrogen)**, proper **temperature**, and sufficient **water supply**. Without these, the effect declines or reverses.
- **Climate Relevance**: While it increases carbon absorption, it cannot fully offset **global warming**.

Amazon Rainforest

The **Amazon Rainforest** is the **largest tropical rainforest on Earth**, often called the **"Lungs of the Planet"**, as it produces about **20% of the world's oxygen** and stores vast amounts of carbon.

Key Facts

- **Location & Size**: Covers **6 million sq. km**, spread across 9 South American nations; **60% in Brazil**.
- **Boundaries**: Guiana Highlands (North), Andes (West), Brazilian Plateau (South), Atlantic Ocean (East).
- **Climate**: Receives heavy rainfall, has constant warmth, and high humidity—ideal for dense canopy forests.
- **Biodiversity**: Hosts **10% of global species**, including jaguar, manatee, anaconda, macaws, and rare medicinal plants.
- **Flora**: Brazil nut, rubber tree, mahogany, rosewood, and palms dominate.
- **Protected Areas**: Includes **Yasuni (Ecuador)**, **Jau (Brazil)**, and **Manu (Peru)**.

- **Amazon River**: World's largest by discharge; flows 6,400 km with tributaries like **Negro, Madeira, Xingu**.

Conclusion

The **carbon fertilisation effect** shows nature's resilience, but its benefits are **temporary and conditional**. Long-term climate stability requires reducing emissions while protecting forests, not relying only on CO_2-driven growth.

SUPREME COURT GREEN CRACKERS RELAXATION (DELHI-NCR)

SOURCE: INDIAN EXPRESS

Why in News?

The Supreme Court relaxed the **year-long fireworks ban** in Delhi-NCR, permitting **NEERI and PESO-approved green crackers** for **Deepavali 2025**, marking a test case to balance festivals with pollution control.

About Green crackers

Green crackers are **eco-friendly alternatives** to conventional fireworks, designed to **reduce air pollution**, particulate matter, and gaseous emissions, while allowing cultural celebrations to continue safely.

Key Points

- **Pollution Reduction**: Achieve **≥30% reduction in PM** or **20% PM + 10% gaseous emissions** compared to conventional crackers.
- **Types**:
  1. **Improved Fireworks** – Modified traditional crackers.
  2. **New Formulation Fireworks** – Developed with new low-emission materials.
- **Regulatory Framework**: Only **PESO-approved** crackers meeting emission standards are allowed.
- **Past SC Judgement**: In **Arjun Gopal vs Union of India (2018)**, non-certified fireworks containing barium salts were banned.
- **Social Impact**: Enables celebration while **protecting public health and reducing smuggling of conventional crackers**.

INDIAN INITIATIVES, EFFORTS AND COMMITMENTS

DELHI DECLARATION ON LOCAL ACTION FOR GLOBAL CLIMATE GOALS

SOURCE: THE HINDU

Why in News?

The **Delhi Declaration on Local Action for Global Climate Goals** was adopted at the **ARISE Cities Forum 2025** in New Delhi and is set to be presented at **COP30 in Brazil**, marking a major commitment by Global South cities toward climate action through multilevel governance.

- Urban areas are central to addressing climate change, as they contribute over **70% of global CO_2 emissions** while housing more than **50% of the world's population**, projected to rise to **68% by 2050**.
- The **Delhi Declaration 2025** underscores cities' pivotal role in translating global climate goals into actionable local strategies, especially in the Global South, fostering sustainability, resilience, and equity.

Delhi Declaration 2025: Key Features

1. Advance Local Climate Action

- Strengthen **multilevel Nationally Determined Contributions (NDCs)** for measurable outcomes.
- Support local governments with **resources, technical capacity, and planning tools**.

2. Inclusive Urban Resilience

- Promote **nature-based solutions, circular economy, and adaptation measures** in urban planning.
- Focus on infrastructure that reduces vulnerability to heatwaves, floods, and pollution.

3. Just Transitions

- Ensure **equity and fairness** in moving toward **net-zero emissions**.
- Protect livelihoods of vulnerable urban populations during industrial or energy transitions.

4. Citizen Empowerment

- Expand participation of **women, youth, and communities** in climate decision-making.

- Encourage **grassroots innovation and local solutions** for climate challenges.

5. Strengthened Governance

- Build **transparent, accountable, and data-driven systems** for climate action.
- Enhance urban monitoring, reporting, and climate data integration.

6. Climate Finance Mobilisation

- Facilitate **direct access to climate finance** for cities.
- Encourage investments in renewable energy, green infrastructure, and resilient urban systems.

7. Global South Leadership

- Promote **South-South cooperation** and **knowledge sharing** on innovative climate solutions.
- Strengthen leadership of cities in shaping global climate negotiations.

Significance for India and the Global South

Urban Climate Governance & Policy Integration

- Urban governance frameworks allow cities to plan, implement, and monitor climate action effectively.
- Examples: **Pune and Surat's heat action plans**, **Indore's circular waste management**, **Kochi's flood mitigation using green infrastructure**.

National Initiatives Supporting Urban Climate Action

- **National Mission on Sustainable Habitat (NMSH):** Energy-efficient buildings, waste management, sustainable mobility.
- **Smart Cities Mission (SCM):** Climate-smart infrastructure, renewable energy, integrated command centres.
- **ClimateSmart Cities Assessment Framework (CSCAF):** Evaluates cities on energy, mobility, water, waste, and planning.
- **NIUA C-Cube:** Mainstreaming climate action in urban local bodies.
- **AMRUT 2.0, NCAP, Urban Forestry & Nature-Based Solutions, Green Mobility Initiatives:** Enhance resilience, reduce emissions, and promote clean urban environments.

Conclusion

The **Delhi Declaration 2025** empowers cities of the Global South to act as equal partners in global climate governance. By integrating **local solutions, citizen participation, and multilevel governance**, it paves the way for **resilient, sustainable, and inclusive urban futures**. Urban leadership is now central to achieving climate security worldwide.

DISASTER MANAGEMENT

URBAN FLOOD RISK MANAGEMENT PROGRAMME (UFRMP) PHASE-2

SOURCE: HINDUSTHAN TIMES

Why in News?

The union Home minister-led committee recently approved **Phase-2** of the **Urban Flood Risk Management Programme (UFRMP)** to mitigate flood risks in **11 major Indian cities**.

About Urban Flood Risk Management Programme (UFRMP)

- The **UFRMP** is a national initiative designed to **strengthen urban flood resilience** through a mix of **structural and non-structural measures**.
- It reflects India's growing focus on managing **climate-induced urban disasters**.

Cities Covered

- **11 cities:** Bhopal, Bhubaneswar, Guwahati, Jaipur, Kanpur, Patna, Raipur, Thiruvananthapuram, Visakhapatnam, Indore, and Lucknow.
- Selected based on **population density**, **flood proneness**, and **urban vulnerability**.

Funding Pattern

- **Centre-State cost sharing:** 90% Centre, 10% State (as per NDMF guidelines).
- Encourages state participation while ensuring **central oversight**.

Key Structural Measures

- **Interlinking of water bodies** for stormwater management.
- **Construction of flood protection walls and embankments.**
- **Erosion control and soil stabilization** using **nature-based solutions (NBS)**.
- **Upgrading drainage networks** and improving **urban planning** to prevent waterlogging.

Non-Structural Measures

- **Early Warning Systems (EWS)** for floods.
- **Data Acquisition Systems** to monitor rainfall, flow, and drainage.
- **Capacity building and training** for local authorities.
- **Public awareness programs** promoting flood-safe behavior.

Significance

- Addresses challenges of **rapid urbanization and poor drainage planning**.
- Supports India's **National Disaster Management Plan (NDMP)** goals.
- Enhances **climate resilience** and **disaster preparedness** in cities.

INDIA'S DISASTER RISK REDUCTION (DRR): TOWARDS A RESILIENT NATION

SOURCE: THE HINDU

Why in News?

India is advancing towards **science-based, nature-driven, and finance-linked disaster resilience**, guided by the **Prime Minister's 10-Point Agenda on Disaster Risk Reduction (2016)**. The **15th Finance Commission's ₹2.28 lakh crore allocation (2021–26)** marks a major policy shift from reactive relief to **proactive disaster governance**.

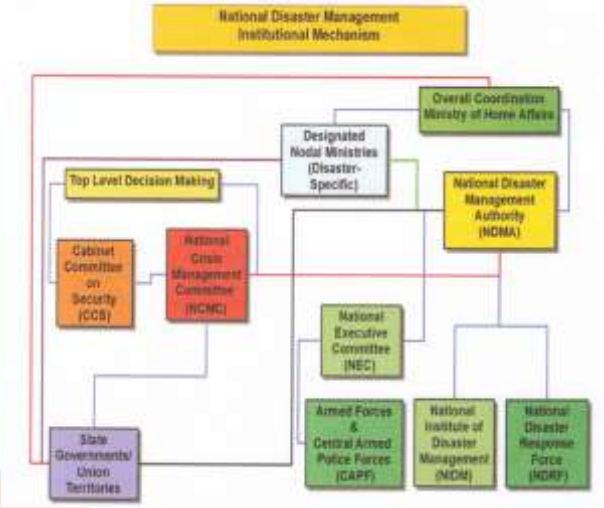
Institutional Framework for DRR

- **Ministry of Home Affairs (MHA)** and **National Disaster Management Authority (NDMA)** lead DRR efforts, ensuring **multi-hazard planning**.
- **Key frameworks:**
  - *National Guidelines for Landslide Risk Management (2023)*
  - *Urban Flood Management Framework (2024)*
- These promote **uniform preparedness, standard operating protocols,** and **risk-sensitive infrastructure**.

Prime Minister's 10-Point Agenda on DRR

A visionary roadmap integrating DRR into national development, emphasizing:

- **Mainstream DRR** in all sectors and policies.
- **Invest in risk mapping, mitigation, and early warning systems.**
- **Strengthen community resilience** and local capacity.
- **Leverage technology** for monitoring and response.
- **Promote ecosystem-based solutions** for sustainable resilience.
- **Enhance global cooperation** and knowledge sharing.



Financial Innovation for Disaster Preparedness

- **15th Finance Commission Allocation (2021–26): ₹2.28 lakh crore**
  - **10%** – Preparedness
  - **20%** – Mitigation
  - **40%** – Response
  - **30%** – Reconstruction
- Reduces dependence on international loans by ensuring **domestic funding convergence.**
- States like **Uttarakhand, Assam, Sikkim, and Kerala** have received over **₹5,000 crore** for recovery and reconstruction.

Nature-Based and Technological Interventions

- **Eco-engineering Solutions:** Use of **bio-engineering** for slope stabilization, **wetland restoration** for flood control, and **fuel-breaks** to prevent forest fires.
- **Technological Integration:**
  - Advanced **remote sensing, glacial-lake monitoring**, and **AI-based weather prediction**.
  - **Mobile Apps:** *FloodWatch*, *Mausam*, *Meghdoot*, *Damini*—offer real-time alerts to citizens.
  - **National Cyclone Risk Mitigation Programme (NCRMP):** Built 700 shelters and established early-warning networks in 8 coastal states.

Capacity Building and Community Preparedness

- **National Institute of Disaster Management (NIDM):** Offers training in **36 streams of disaster response**.

- **Volunteer Initiatives:**
  - *Apda Mitra* and *Yuva Apda Mitra* train over **2.5 lakh citizens** in first response.
  - Panchayats and schools conduct **local DRR plans and safety drills**, enhancing behavioural readiness.

International Cooperation

- **Coalition for Disaster Resilient Infrastructure (CDRI):** India-led global platform promoting climate-resilient infrastructure.
- Active engagement with **G20, BIMSTEC**, and **Indian Ocean Rim Association** for sharing best practices.
- Aligns with **Sendai Framework (2015–2030)** and **SDG-13 (Climate Action).**

Key Challenges (Mnemonic: FRAGILE)

- **F – Fragile Ecosystems:** Cascading disasters in Himalayas (e.g., 2023 Sikkim GLOF).
- **R – Reactive Governance:** Relief-centric instead of preventive.
- **A – Administrative Weakness:** Poor district-level coordination and fund delays.
- **G – Governance Gaps:** Urban flooding due to weak land-use control.
- **I – Inadequate Technology:** Early-warning systems not universal.
- **L – Lax Building Code Enforcement:** Unsafe, informal construction in quake zones.
- **E – Expanding Vulnerability:** Poverty and marginalisation increase exposure.

Way Forward (Mnemonic: RESILIENT)

- **R – Risk-informed Planning:** Integrate DRR in budgets; restrict risky settlements.
- **E – Early Warning Systems:** Use **IoT sensors** and geo-tagged alerts.
- **S – Strengthen Infrastructure:** Enforce seismic codes, retrofit critical facilities.
- **I – Inclusive Preparedness:** Empower districts and local response teams.
- **L – Local Capacity:** Decentralise funds and decision-making.
- **I – Institutional Coordination:** Engage private sector beyond CSR.
- **E – Economic Readiness:** Promote disaster insurance and resilience funds.
- **N – Nature-Based Solutions:** Restore **mangroves, wetlands, and forests.**
- **T – Training:** Train **1 million "Aapda Sakhi" women volunteers** and medical first responders.

Conclusion

India's disaster resilience remains **FRAGILE**, but a **RESILIENT approach** integrating planning, technology, local empowerment, and nature-based solutions can transform risk into resilience.
By 2047, a **climate-smart and disaster-resilient India** can emerge as a global model for **anticipatory governance** and **sustainable development.**

PRELIMS POINTERS IN NEWS

AMRABAD TIGER RESERVE

SOURCE: THE HINDU

Why in News?

A **54 km-long elevated road bridge** has been proposed across the **Nallamala forests** of the **Amrabad Tiger Reserve** in Telangana. It aims to reduce wildlife-vehicle collisions and serve as a **model for eco-sensitive infrastructure** in India.

Key Features

- **Origin & Area**: Once part of the **Nagarjunasagar-Srisailam Tiger Reserve**, it became a separate entity after Telangana's formation in 2014.
- **Core Area**: About **2,166 sq. km**, making it the **second-largest core area** among tiger reserves in India.
- **Geography**: Characterized by **rugged hills, deep valleys, and dense dry deciduous forests**.
- **Rivers & Forts**: The **Krishna River** flows through it; the **Nagalapuram Fort** lies within.
- **Flora**: Dominated by **teak, bamboo, sal, and acacia**, along with **medicinal plants** used by local tribes.
- **Fauna**: Home to **tigers, leopards, sambars, nilgai, gaurs, and 300+ bird species**.
- **Tribes**: The **Chenchu tribe**, a Particularly Vulnerable Tribal Group (PVTG), inhabits this region.

Significance

- Protects biodiversity and serves as a **carbon sink**.

- Vital **watershed** for the **Srisailam and Nagarjunasagar Dams**.
- Promotes **eco-tourism and tribal livelihoods**.

PAINTED STORK

SOURCE: THE HINDU

Why in News?

After a **four-year gap**, a pair of **Painted Storks** was recently spotted in **Kaziranga National Park**, indicating an **improving wetland habitat** in Assam.

Key Features

- **Distribution**: Found throughout the **Indian subcontinent** and parts of **Southeast Asia**, especially around river plains and marshlands.
- **Habitat**: Prefers **freshwater wetlands, ponds, and flooded rice fields**.
- **Diet**: Primarily **piscivorous**, feeding on fish, amphibians, insects, and small reptiles.
- **Breeding**: Nests colonially near water bodies; both parents care for the young.
- **Physical Traits**: White plumage with **black flight feathers and pink tertials**; no major difference between sexes, though males are slightly larger.

Conservation Status

- **IUCN Red List**: **Near Threatened (NT)** due to habitat loss, pollution, and wetland degradation.
- **Protected under** the **Wildlife Protection Act, 1972 (Schedule IV)** in India.

BRIDGEOPORUS KANADII – NEW FUNGUS SPECIES

SOURCE: DOWN TO EARTH

Why in News?

Scientists have discovered a **new fungus species**, *Bridgeoporus kanadii*, in the forests of **Arunachal Pradesh**, notable for its **gigantic fruiting bodies**.

About Bridgeoporus kanadii:

- **Discovered in:** Arunachal Pradesh, India.
- **Named after:** Indian mycologist **Kanad Das** for his contributions to macrofungal research.
- **Unique feature:** Has **massive fruiting bodies**, some over **3 meters in radius**, large enough to support human weight.
- Only one other species of this genus — *B. nobilissimus* — is found in **North America**, which is smaller in size (up to 1.5 m).

Ecological Role:

- Plays a **key role in forest ecosystems** by **decomposing dead wood**, aiding **nutrient cycling** and **forest regeneration**.
- Most specimens were found on **dead fir trees**, indicating its preference for decaying conifers.

Significance:

- Highlights India's **rich fungal diversity** in the **Eastern Himalayas**.
- Emphasizes the need for **forest conservation** to protect undiscovered species.
- Shows potential for **mycological research** though it has **no direct economic use** and is **inedible**.

PARAMYROTHECIUM STRYCHNI

SOURCE: THE HINDU

Why in News?

Researchers in **Kerala** have identified a **new fungal species**, *Paramyrothecium strychni*, which affects the **endemic medicinal plant Strychnos dalzellii**.

About the Fungus:

- **Discovered from:** Leaf spots and blight disease on *Strychnos dalzellii*.
- **Based on:** Morphological and **multi-gene molecular phylogenetic analysis**.
- **Genus:** *Paramyrothecium* — known for **phytopathogenic (plant disease-causing)** fungi.
- **Global Context:** 25 known species worldwide, mostly causing **leaf blights** in various crops and plants.

Host Plant – Strychnos dalzellii:

- **Family:** Loganiaceae.
- **Distribution:** Endemic to **Western Ghats** of India.
- **Uses:** Known for **alkaloids** with **analgesic, anti-inflammatory, and antimicrobial** properties.
- Traditionally used to treat **fever, rheumatism, and digestive disorders**.
- **Conservation Status: Vulnerable (VU)** – IUCN Red List.
- **Threats:** Habitat destruction and overharvesting.

Significance:

- Raises concern over **emerging fungal pathogens** threatening endemic flora.
- Calls for **disease monitoring** and **conservation of medicinal plants**.
- Adds to the **biodiversity mapping** of plant-fungal interactions in India.

NESOLYNX BANABITANAE

SOURCE: INDIAN EXPRESS

Why in News?

A **new wasp species**, *Nesolynx banabitanae*, was discovered in **Central Park, Salt Lake, West Bengal**, expanding India's insect biodiversity record.

About the Wasp:

- **Family:** Eulophidae; a **diverse parasitic wasp family**.
- **Hyperparasitoid:** Parasitizes other parasitoid wasps (e.g., *Charops aditya*), which in turn parasitize caterpillars.
- **Significance:** Adds a **layer of ecological complexity** and helps regulate insect populations naturally.
- **Naming:** 'Banabitanae' honors the **local name of Central Park**.

Ecological Role:

- **Biocontrol:** Controls populations of **caterpillar pests** indirectly.
- **Biodiversity Indicator:** Highlights **rich urban insect fauna** in India.
- **Conservation Insight:** Protecting habitats like parks can preserve **rare insect species**.

IMPATIENS RAJIBIANA

SOURCE: THE HINDU

Why in News?

The **Botanical Survey of India (BSI)** has discovered a **new balsam species, Impatiens rajibiana**, in the forests of Shergaon, **West Kameng district, Arunachal Pradesh**.

About the Species:

- Belongs to the **Balsaminaceae** family, commonly called **balsams** or **touch-me-nots**.
- Found growing in **moist, shaded forest areas** at an altitude of over **2,000 meters**.
- Named **Impatiens rajibiana** in honor of a distinguished Indian botanist.

Key Characteristics:

- The plant shows **vivid floral pigmentation** and delicate petal structure typical of Himalayan balsams.
- Adapted to **high humidity and cool temperatures**.
- Exhibits **endemic traits**, meaning it is **unique to the region** and not found elsewhere.

Significance:

- Adds to India's **rich floral diversity**, as the country already hosts **around 230 Impatiens species**.
- Enhances understanding of **Himalayan ecosystem evolution** and climate adaptation of flora.
- Reinforces the role of **Arunachal Pradesh as a biodiversity hotspot**, with 16 new Impatiens species discovered between 2013–2017.

INDIAN WOLF (CANIS LUPUS PALLIPES)

SOURCE: INDIAN EXPRESS

Why in News:

For the first time, the **IUCN** evaluated the **Indian wolf** separately, highlighting its conservation needs amid habitat loss and persecution. The subspecies is now recognised as **Vulnerable**, with protections under **CITES Appendix I** and India's **Wildlife (Protection) Act, 1972 — Schedule I**.

About Indian Wolf

- The Indian wolf, an ecotype adapted to semi-arid plains, scrublands and pastoral landscapes, differs from other wolves in behaviour, size and ecology.
- Its survival is tightly linked to rural land-use, prey availability and human coexistence.

Biology & Distribution

- **Habitat:** Prefers **scrublands, grasslands and agro-pastoral mosaics** rather than dense forests.
- **Pack Structure:** Lives in **small packs** (often 4–8 individuals) and displays territorial but less vocal behaviour.
- **Adaptations:** Lacks a heavy winter coat; adapted to hotter climates across India, Pakistan, Afghanistan and parts of West Asia.

Threats

- **Habitat Loss & Fragmentation:** Conversion to agriculture, infrastructure and urban sprawl reduce continuous ranges.
- **Prey Decline:** Overgrazing and decline of wild ungulates force wolves toward livestock, increasing conflict.
- **Human Persecution:** Retaliatory killings, poisonings and illegal trapping persist.
- **Genetic Isolation:** Small, fragmented populations risk inbreeding and local extinctions.

Conservation Measures

- **Legal Protection:** Listed under **Schedule I**, providing highest protection and penalties for offences.
- **Community Coexistence:** Livestock management, guardian animals and compensation schemes reduce conflict.
- **Habitat Restoration:** Grassland restoration and prey recovery are crucial.
- **Research & Monitoring:** Separate IUCN evaluation underlines the need for targeted population surveys and genetic studies.

BARNAWAPARA WILDLIFE SANCTUARY – BLACKBUCK REVIVAL

SOURCE: DOWN TO EARTH

Why in News?

After **50 years of local extinction**, the **blackbuck has returned** to **Barnawapara Wildlife Sanctuary, Chhattisgarh**, due to a focused five-year conservation plan.

Barnawapara Wildlife Sanctuary spans **245 sq. km** in **Mahasamund district**. Named after the **Bar and Nawapara villages**, it features tropical dry deciduous forests and rich biodiversity.

Flora & Fauna

- **Flora:** Teak, Sal, Bamboo, Terminalia, Semal, Mahua, Ber, Tendu.
- **Fauna:** Tigers, leopards, Indian bison, neelgai, wild boar, porcupines, pythons, antelopes, and over 150 bird species including **blackbucks**.

Conservation Efforts

- **Focused Revival Plan:** Habitat restoration, anti-poaching measures, and monitoring.
- **Ecological Balance:** Restoration of prey-predator dynamics to support long-term survival of species.
- **Community Engagement:** Local communities involved in protection and awareness campaigns.

Significance

- Enhances **biodiversity and ecological stability**.
- Serves as a **model for species recovery** in other sanctuaries.
- Strengthens India's **wildlife conservation commitments** under **CITES** and **Biodiversity Act, 2002**.

HYGROCYBE PELLUCIDA

SOURCE: INDIAN EXPRESS

Why in News?

Scientists from the **Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI)**, Kerala, have recorded the **first sighting of the mushroom species *Hygrocybe pellucida*** in India.

About *Hygrocybe pellucida*

- *Hygrocybe pellucida* belongs to the **family Hygrophoraceae** — commonly known as "waxcap fungi." These fungi are **bioindicators of healthy ecosystems**, thriving only in **clean, undisturbed habitats**.

Key Details

- **Discovery Site: Western Ghats region**, Kerala.
- **Morphology:** Distinct **translucent orange cap**, with **shiny, waxy texture** and slender stipe.
- **Ecological Role:** Plays a vital role in **nutrient cycling and soil health**.
- **Global Distribution:** Previously reported in **Europe and North America**; this marks its **first record in Asia**.
- **Conservation Insight:** Indicates **high biodiversity and low pollution** in sampling zones.

Significance

- Adds to **India's mycological richness** (over 23,000 known fungal species).
- Highlights the **ecological value of the Western Ghats**, a **UNESCO World Heritage Site**.
- Calls for **further fungal taxonomy research and habitat conservation**.

INDIAN SCOPS-OWL

SOURCE: THE HINDU

Why in News?

Birdwatchers recently recorded the **first-ever sighting of the Indian Scops-Owl** near **Daroji Sloth Bear Sanctuary, Karnataka**, a remarkable addition to regional biodiversity records.

The **Indian Scops-Owl (Otus bakkamoena)** is a **small nocturnal owl** native to **southern Asia**, known for its **distinctive yellow eyes and cryptic plumage**. It inhabits **forests, scrublands, and agricultural areas**.

Physical Characteristics

- Height: 17–20 cm; wingspan: ~45 cm.
- Stocky body with **round head and short tail**.
- Feathers: **Browns and greys with striped patterns**, soft for insulation.
- Eyes: Large **yellow with black pupils**.

Behavior and Habitat

- **Nocturnal hunter** feeding primarily on insects.
- Non-migratory; remains in the same region year-round.
- Habitat: Forests, scrublands, agricultural areas in India, Nepal, Pakistan, Sri Lanka, and Iran.

Conservation Status

- Classified as **Least Concern (IUCN Red List)**.
- Important for **ecological balance**, controlling insect populations.

Significance of the Sighting

- Indicates **healthy biodiversity** in Daroji Sanctuary.
- Helps in **mapping species distribution** and conservation planning.

"WE RISE" INITIATIVE BY UN INDIA

SOURCE: THE HINDU

Why in News?

The **United Nations in India** launched the **"We Rise" initiative** to promote **gender equality, inclusion, and climate resilience**, especially among young people and marginalized communities.

About "We Rise" Initiative

- "We Rise" is a **nationwide UN-led campaign** to align with the **Sustainable Development Goals (SDGs)** — particularly SDG 5 (Gender Equality) and SDG 13 (Climate Action). It aims to create **inclusive platforms** for youth and women to take leadership roles in addressing social and environmental challenges.

Key Highlights

- **Collaborators:** Implemented in partnership with **UN Women, UNDP, and UNEP**.
- **Objectives:**
  - Empower women and youth to lead **climate-resilient development projects**.
  - Promote **digital literacy, sustainable livelihoods, and community innovation**.
  - Encourage **storytelling and grassroots leadership** across states.
- **Launch Event:** Held in **New Delhi (2025)**, with participation from civil society, artists, and policymakers.
- **Target Audience:** Rural women entrepreneurs, young climate activists, and underrepresented groups.

Significance

- Builds **intersectional equality** linking gender and environment.
- Supports **India's Mission LiFE (Lifestyle for Environment)**.
- Strengthens India's **SDG implementation framework** through public participation.

SUNDARBANS' SAIME MODEL WINS FAO GLOBAL RECOGNITION

Why in News?

The Sustainable Aquaculture in Mangrove Ecosystems (SAIME) model developed by the Nature Environment and Wildlife Society (NEWS) in the Sundarbans (West Bengal) has received **Global Technical Recognition** from the Food and Agriculture Organization (FAO) during its 80th-anniversary celebrations.

About Coastal ecosystems

- Coastal ecosystems like mangroves face acute threats from aquaculture expansion, sea-level rise and salinity intrusion.
- The SAIME model presents an **innovative pathway** to reconcile **livelihood security** through aquaculture with **ecosystem conservation** in the Sundarbans mangrove belt. It integrates coastal resilience, community participation and sustainable food production.

Key Features of the SAIME Model

1. **Mangrove-inclusive aquaculture design**
   - Under SAIME, 5 % to 30 % of aquaculture pond area is maintained under mangrove vegetation, thus preserving canopy cover and root structure even within pond systems.
   - This helps maintain ecological functions while allowing shrimp/fish farming to continue.
2. **Use of natural mangrove litter for feed**
   - Farmers use fallen mangrove leaves and litter as natural fodder for the high-value shrimp species Penaeus monodon (Black Tiger Shrimp), thereby reducing dependency on chemical inputs and commercial feed.
   - This reduces cost, input-intensity and environmental impact.
3. **Climate-adaptation and coastal-resilience linkage**
   - Mangrove inclusion strengthens pond systems against salinity intrusion, tidal action and erosion — crucial for the Sundarbans region facing sea-level rise.
   - The model also contributes to carbon sequestration via mangrove biomass and soils.
4. **Community-based implementation and scaling**
   - SAIME is implemented in districts such as North 24 Parganas (Chaital) and South 24 Parganas (Madhapur) by NEWS in collaboration with local fish/shrimp farmers.
   - Over approx. 29.84 hectares with around 42 farmers have adopted the model in pilot phase.
5. **Economic benefit for farmers**
   - By cutting production costs and lowering chemical inputs, farmers practicing SAIME have reportedly more than **doubled their annual net profits** compared to conventional pond farming.
   - This combination of economic uplift + ecological safety makes it a scalable model.

Significance & Implications

- **Ecosystem conservation**: Maintaining mangrove cover within aquaculture systems protects root-soil structure, biodiversity and the natural buffer functions of the Sundarbans mangrove forest.
- **Sustainable livelihoods**: Coastal farmers in fragile zones can earn higher incomes via a method sensitive to environment, extending the idea of blue economy with nature-based solutions.
- **Climate mitigation & adaptation**: Mangroves sequester carbon strongly, and their integration into aquaculture supports the agenda of "nature-based solutions" under global climate goals.
- **Scaling potential**: The global recognition by FAO signals replicability in other deltaic and mangrove regions globally, aligning with sustainable food system frameworks and ecosystem restoration drives.
- **Policy relevance**: The model underscores how **co-management**, local participation and ecosystem linkage can be embedded into aquaculture policy, coastal zone management and blue carbon strategies.

Challenges & Considerations

- **Scaling across variable geographies**: The Sundarbans has unique hydrology and ecology; adapting the model elsewhere will require local tailoring.
- **Ensuring mangrove health & species suitability**: Mangrove species must thrive under semi-aquaculture conditions; only certain species may be appropriate.
- **Monitoring socio-ecological trade-offs**: While profit increases are reported, long-term effects on biodiversity, water quality and land use need oversight.
- **Policy & institutional coordination**: Aligning aquaculture regulation, forest/mangrove protection laws, and community livelihoods demands strong multi-agency governance.

Conclusion

The **SAIME model** proves that livelihood security and ecological conservation can go hand in hand through community-driven innovation. By integrating mangroves into aquaculture, it builds **climate resilience and sustainable income** for coastal communities. Its **FAO recognition** underscores India's growing leadership in **nature-based and blue economy solutions**.

SCIENCE AND TECHNOLOGY

MEDICAL HEALTH/VACCINES/DISEASES

UNIVERSAL IMMUNISATION PROGRAMME (UIP) IN INDIA

SOURCE: PIB

Why in News?

India's **Universal Immunisation Programme (UIP)**, the **largest vaccination drive in the world**, covers **2.6 crore infants and 2.9 crore pregnant women annually**.

About Immunisation

- Immunisation is one of the **most cost-effective public health interventions**, preventing millions of deaths globally each year.
- In India, the **Universal Immunisation Programme (UIP)**, launched in 1985, has become a cornerstone of preventive healthcare.

S. N	Vaccine	Protection against
1	BCG	Tuberculosis
2	Hepatitis B	Hepatitis B, liver infection
3	Oral Polio Vaccine	Polio
4	Inactivated Polio Vaccine	
5	Pentavalent vaccine	Diptheria, Pertussis, Tetanus, Hepatitis B &Haemophilus Influenza B
6	Measles Vaccine	Measles
7	DPT Vaccine	Diptheria, Pertussis, Tetanus
8	TT (Tetanus Toxoid)	Tetanus
9	Rota virus Vaccine	Diarrhoea
10	Japanese Encephalitis Vaccine	Japanese Encephalitis - a brain infection

Status of Immunisation in India

1. **Coverage**
   - Vaccinates **2.6 crore children and 2.9 crore pregnant women annually**.
   - Provides free vaccines against **12 diseases nationally**, and 3 more (Rotavirus, Pneumococcal Pneumonia, Japanese Encephalitis) in select states.
2. **Evolution**
   - Began as **Expanded Programme on Immunisation (EPI) in 1978**.
   - Upgraded to **UIP in 1985**, extending outreach to rural India.
3. **Mission Indradhanush (2014)**
   - Special campaign to immunize **unvaccinated and partially vaccinated children**.
   - **Intensified Mission Indradhanush (IMI) 2017** further boosted coverage.
   - **IMI 5.0 (2023)** focused on **catch-up vaccination for children under 5 years and pregnant women**.

4. **Current Status**
   - India's **full immunisation coverage is ~98% (FY 2024-25)**, showing near-universal reach.

Key Achievements

1. **Polio Eradication**
   - India certified **polio-free in 2014**, a milestone in global public health.
2. **Maternal and Neonatal Tetanus Elimination (MNTE)**
   - Achieved in 2015, **ahead of global deadline**.
3. **Disease Elimination Milestones**
   - India declared **Yaws-free**.
   - Dramatic reduction in measles and rubella cases with the **MR vaccination campaign**.
4. **Digital Innovations**
   - **U-WIN platform** launched for **end-to-end vaccine tracking** from pregnancy to childhood (up to 16 years).

- Builds on success of **Co-WIN**, helps cover **migratory populations**.

5. **Efficient Vaccine Management**
   - **Electronic Vaccine Intelligence Network (eVIN)** enables **real-time monitoring of stock and cold-chain logistics**.
   - Integrated under the **Ayushman Bharat Health Infrastructure Mission**.

Challenges to Achieving Universal Immunisation

1. **Remote Populations**
   - Reaching **tribal, nomadic, and hilly regions** remains difficult.
   - States like **UP, Bihar, and North-East** face the biggest gaps.
2. **Vaccine Hesitancy**
   - Myths, misinformation, and cultural beliefs fuel reluctance.
   - Resistance persists in **pockets with low literacy**.
3. **Pandemic Disruption**
   - COVID-19 caused a setback in routine immunisation, leading to **gaps and local measles outbreaks**.
4. **Low Awareness**
   - Urban slums and marginalised areas still have **poor awareness and weak health outreach**.
5. **Systemic Gaps**
   - Shortage of **trained health workers**, weak last-mile logistics, and **irregular immunisation sessions** hinder universal coverage.

Measures to Achieve Universal Immunisation

1. **Strengthening National Immunisation Days (NIDs)**
   - Replicate the **Pulse Polio success model** for other vaccines.
2. **Expanding Social Mobilisation**
   - Use **local influencers, community leaders, and media campaigns** to combat hesitancy.
   - Focus on **interpersonal counselling at family level**.
3. **Strengthening Task Forces**
   - Empower **State, District, and Block Task Forces** to monitor and coordinate vaccination drives.
4. **Scaling Up Supplementary Campaigns**
   - Conduct **catch-up campaigns** in low-coverage areas.
   - Target **drop-outs and left-out children** systematically.
5. **Village Health and Nutrition Days (VHNDs)**
   - Organise **regular immunisation drives in villages**, especially in underserved regions.
6. **Digital Integration**
   - Expand **U-WIN portal** for universal tracking.
   - Encourage use of **digital immunisation cards** for easy access and portability.

Conclusion

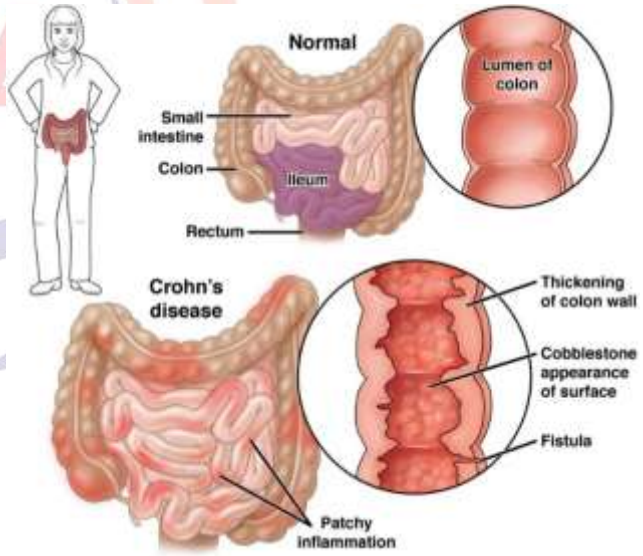
India's **Universal Immunisation Programme** is a global example of how large-scale public health initiatives can transform lives. While **98% coverage** reflects remarkable success, challenges of **last-mile access, vaccine hesitancy, and systemic weaknesses** must be resolved. With sustained campaigns, digital innovations, and inclusive outreach, India can move towards **true universal immunisation**, protecting every child and mother.

CROHN'S DISEASE

SOURCE: THE HINDU

Why in News?

Recent studies indicate that diets high in **ultra-processed foods (UPFs)** may aggravate gut inflammation and trigger **flare-ups in Crohn's disease** patients.



About Crohn's Disease:

- **Definition:** Chronic **inflammatory bowel disease (IBD)** causing inflammation throughout the digestive tract, most often affecting the **small intestine and beginning of the large intestine**.
- **Inflammation:** Can extend to **deep layers of the bowel**, leading to tissue damage.
- **Symptoms:**
  - Persistent **diarrhea**
  - **Abdominal cramps and pain**
  - **Weight loss**
- **Age Group:** Most common between **20–29 years**.

- **Causes:** Exact cause unknown; **genetics, immune system abnormalities, and gut microbiome imbalances** are implicated.

Treatment and Management:

- No **cure** exists, but symptoms can be **managed** with medication, diet modification, and sometimes surgery.
- Treatment aims to:
  - **Reduce inflammation**
  - Achieve **remission**
  - Restore normal **digestive function**
- Lifestyle measures, including avoiding ultra-processed foods, may **limit flare-ups**.

Significance:

- Chronic condition affecting **quality of life** and potentially leading to **serious complications** like intestinal obstruction or fistula formation.
- Awareness of dietary impact can help **prevent exacerbations** and improve **long-term outcomes**.

SUDDEN INFANT DEATH SYNDROME (SIDS)

SOURCE: DOWN TO EARTH

Why in News?

October is observed globally as **Sudden Infant Death Syndrome (SIDS) Awareness Month**, drawing attention to this leading cause of unexplained infant deaths.

About SIDS:

- Refers to the **sudden, unexplained death of an infant below one year**, even after thorough medical and forensic investigation.
- Also known as **cot death** or **crib death**, it typically occurs during **sleep** and affects more **male infants**.

Risk Factors:

- **Premature birth or low birth weight.**
- **Family history** of SIDS.
- **Exposure to tobacco smoke** during or after pregnancy.
- **Unsafe sleeping positions** or **overheating** of infants.
- **Lack of prenatal care** for mothers.

Possible Causes:

- Underdevelopment of the **brain region controlling breathing and arousal** from sleep.
- **Genetic vulnerability** or **environmental triggers** like poor air circulation.

Prevention and Awareness:

- Place infants on their **back to sleep** on a firm surface.
- Avoid soft bedding, overheating, or co-sleeping.
- Encourage **breastfeeding and smoke-free environments**.
- Regular **pediatric check-ups** to monitor infant health.

ZOMBIE DEER DISEASE

SOURCE: THE HINDU

Why in News?

Health authorities in Florida confirmed cases of **Chronic Wasting Disease (CWD)**, also called "Zombie Deer Disease," affecting deer and other cervids.

About Zombie Deer Disease

- CWD is a **fatal neurological disease** primarily affecting **deer, elk, moose, and reindeer**. It is caused by **prions**, misfolded proteins that disrupt normal brain function, resulting in progressive neurological damage.

Key Facts

- **Transmission:** Spread through **body fluids** (saliva, blood, urine, feces) and contaminated environments.
- **Symptoms:** Weight loss, behavioral changes, excessive salivation, decreased social interaction, loss of fear.
- **Incubation Period:** 18–24 months; animals appear normal initially.
- **Treatment:** No vaccine or cure; **always fatal**.
- **Human Risk:** No confirmed cases of transmission to humans yet, but caution is advised.

Significance

- **Wildlife Impact:** Threatens **deer populations and biodiversity**.
- **Ecological Consequences:** Alters predator-prey dynamics and ecosystem balance.
- **Public Awareness:** Highlights need for **wildlife monitoring and disease control measures**.

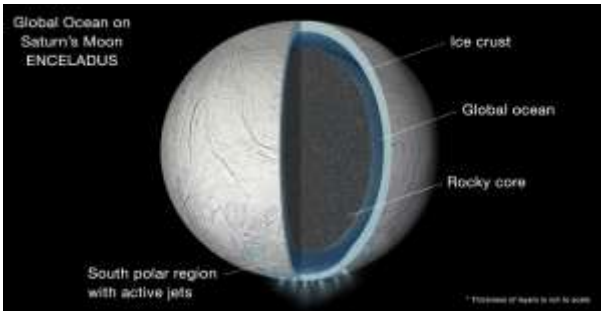
SPACE TECHNOLOGY

CASSINI SPACECRAFT AND SATURN'S MOON ENCELADUS

SOURCE: THE HINDU

Why in News?

Reanalysis of **NASA's Cassini spacecraft** data provided stronger evidence that **Saturn's moon Enceladus** may have conditions suitable for **supporting life**. It remains one of humanity's most successful **planetary exploration missions**.



Mission Overview

- **Launched:** October 15, 1997.
- **Components:**
  - **Cassini Orbiter** – First spacecraft to orbit Saturn.
  - **Huygens Probe** – Landed on **Titan**, Saturn's largest moon.
- **Duration:** 20 years; mission ended in **2017** with Cassini's planned descent into Saturn.

Major Objectives

- **Saturn:** Study atmospheric structure, winds, and internal composition.
- **Rings:** Examine structure, dynamics, and dust interactions.
- **Titan:** Analyze atmosphere, weather patterns, and surface composition.
- **Magnetosphere:** Explore magnetic fields, particle dynamics, and solar wind interactions.

Discoveries About Enceladus

- Found **water-rich plumes** erupting from Enceladus's south pole.
- Detected **organic molecules, salts, and silicate particles**—indicators of hydrothermal activity.
- Evidence of a **subsurface ocean** beneath an **ice crust (20–30 km thick)**.
- Possible **hydrothermal vents**—similar to those that may have birthed life on Earth.

Scientific Importance

- Suggests **habitability** beyond Earth.
- Strengthens the search for **extraterrestrial microbial life**.
- Guides design of future missions like **Europa Clipper** and potential **Enceladus Orbiter**.

PRELIMS POINTERS IN NEWS

DARK STARS

SOURCE: THE HINDU

Why in News?

Astronomers recently found evidence that some of the earliest luminous bodies in the universe could be **"dark stars,"** powered not by **nuclear fusion** but by **dark matter annihilation**.

Key Characteristics of Dark Stars

- **Definition:** Dark stars are **hypothetical stellar objects** powered by the **annihilation of dark matter particles**, rather than hydrogen fusion.
- **Origin:** Formed around **200 million years after the Big Bang**, in the dense regions where dark matter and gas coexisted.
- **Size and Mass:** Could be **400 to 200,000 times wider** than the Sun and **500 to 1,000 times more massive**.
- **Composition:** Made primarily of **hydrogen and helium**, but their energy source comes from **dark matter heating**.

Formation and Energy Mechanism

- **Dark Matter Annihilation:** In regions dense with dark matter, particle collisions released energy, heating the surrounding gas cloud.
- This **prevented gravitational collapse**, allowing a large but diffuse star to form.
- Since **no fusion occurs**, dark stars remain **cooler** and **puffier** than normal stars.

Brightness and Observability

- Despite the name, dark stars are **not truly dark**; they shine brightly in **infrared radiation**.
- A single dark star could be as bright as an **entire young galaxy**.
- However, their **light signatures differ** from fusion-based stars, making them **hard to detect** with visible light telescopes.

Scientific Importance

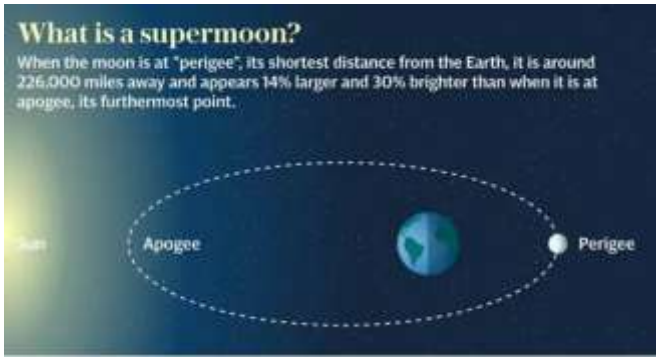
- **Cosmological Significance:** Understanding dark stars could reveal **how the first galaxies formed**.
- **Dark Matter Clues:** Studying them helps scientists learn about the **composition and behavior of dark matter**.
- **Observational Evidence:** New instruments like the **James Webb Space Telescope (JWST)** may confirm their existence.

SUPERMOON

SOURCE: THE HINDU

Why in News?

A **rare Supermoon** recently illuminated skies worldwide, drawing attention to its **astronomical and environmental impacts**.



About Supermoon:

- Occurs when a **full or new moon coincides with the moon's perigee**, its closest approach to Earth.
- Appears about **14% larger and 30% brighter** than usual full moons.
- Coined by **Richard Nolle in 1979**.

Impact of Supermoon:

- **Tides:** Causes **perigean spring tides**, slightly higher or lower than usual.
- **Coastal risk:** Can exacerbate **flooding during storms**.
- **Observation:** Provides **unique visual and scientific opportunities** for astronomy enthusiasts.

Significance:

- Enhances understanding of **moon-Earth dynamics**.
- Important for **coastal planning and tidal predictions**.
- Serves as a **public engagement opportunity** in astronomy.

PLUTONIUM MANAGEMENT AND DISPOSITION AGREEMENT (PMDA)

SOURCE: THE HINDU

Why in News?

The death of around 100 wild boars in Punjab's **Nangal Wildlife Sanctuary** has raised concerns about toxic waste near **Nangal Lake**, which was linked to nuclear waste contamination discussions — bringing the **US-Russia Plutonium Management and Disposition Agreement (PMDA)** back into focus.

About the Agreement:

- **Signed:** In **2000** between the **United States and Russia**.
- **Came into force: 2011.**
- **Purpose:** To reduce **Cold War-era stockpiles of weapons-grade plutonium** that posed proliferation and security risks.

- Both nations agreed to **dispose of 34 tonnes** of plutonium each, converting it into **Mixed Oxide (MOX) fuel** or irradiating it in **fast-neutron reactors** for electricity generation.

Background:

- After the Cold War, the dismantling of nuclear warheads left both countries with large quantities of plutonium.
- Storage was expensive and dangerous, raising fears of it falling into the wrong hands.
- The PMDA was meant to ensure **safe and verifiable disposal**.

Suspension by Russia:

- In **2016**, Russia **suspended** the agreement, citing:
  - **US sanctions** and hostile actions.
  - **NATO expansion.**
  - US deviation from the agreed method — the US began **diluting plutonium** instead of converting it into MOX fuel.

Significance:

- Aimed to **curb nuclear proliferation risks.**
- Reflected a key phase of **post–Cold War nuclear cooperation**.
- Its suspension signaled a **renewed era of mistrust** between the two powers.

RHODAMINE B

SOURCE: THE HINDU

Why in News?

Researchers at the **Raman Research Institute (RRI)** have developed a **low-cost detection method** using the **coffee-stain effect** to identify harmful dyes like **Rhodamine B**.

About Rhodamine B:

- A **synthetic, water-soluble dye** known for its **bright fluorescent pink color**.
- Appears **green in powder form** and turns pink when dissolved in water.
- Commonly used in **textile, leather, paper, and research industries** due to its fluorescent properties.

Health Impacts:

- **Toxic to humans**—can cause **DNA damage**, **mutations**, and **cancerous growths**.
- Prolonged exposure linked to **liver and bladder tumors** in animal studies.
- Causes **skin irritation, allergies**, and long-term **pigmentation changes**.
- Leads to **oxidative stress** and potential **cellular damage** if ingested.

Environmental Concerns:

- **Non-biodegradable**, contaminating water and soil ecosystems.
- Affects aquatic life and enters the **food chain**, posing public health risks.

Significance of RRI's Detection Technique:

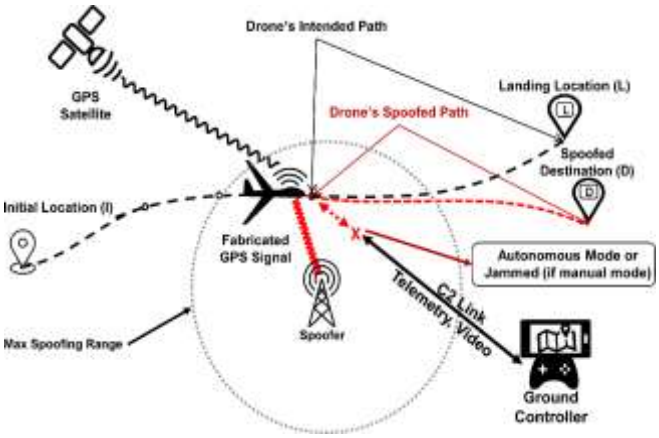
- Uses a **coffee-ring pattern** on slides to identify Rhodamine B traces efficiently.
- Offers a **cost-effective, portable, and accurate** testing method for food safety monitoring.

GPS SPOOFING AND AVIATION RISKS

SOURCE: THE HINDU

Why in News?

An **Air India flight** from Vienna to Delhi was diverted after suspected **GPS spoofing** over the Middle East disrupted its navigation systems, highlighting vulnerabilities in aviation security.



About GPS spoofing

GPS spoofing is a cyberattack where **false satellite signals** mislead receivers into computing incorrect position, time, or navigation data. It is different from jamming because it **feeds deceptive data** instead of merely blocking signals.

Key Points

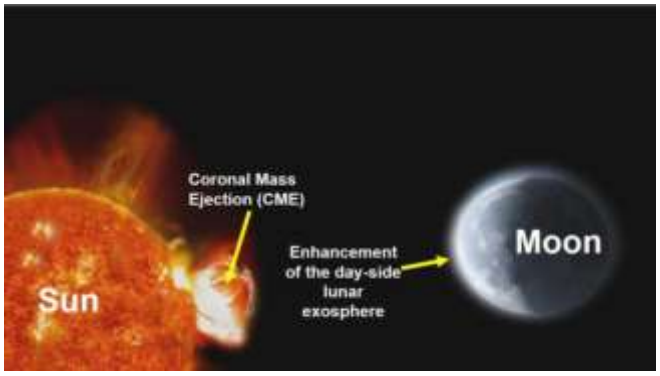
- **Working Mechanism**: Ground-based transmitters emit counterfeit signals stronger than genuine ones, fooling the GPS receiver.
- **Aviation Impact**: Can disrupt **autopilot, autothrust, flight director, and autoland systems**, causing misrouting or collision risks.
- **Mitigation Measures**:
    1. **Backup navigation** like Inertial Reference Systems (IRS).
    2. **Anti-spoofing technologies** and multi-constellation GNSS.
    3. **Pilot training** for manual intervention and situational awareness.
- **Strategic Significance**: Highlights need for **resilient navigation systems** amid increasing cyber threats in critical airspace.

CHANDRAYAAN-2 DETECTS SOLAR CME EFFECTS ON LUNAR EXOSPHERE

SOURCE: THE HINDU

Why in News?

India's **Chandrayaan-2 lunar orbiter** has, for the first time, observed the impact of the Sun's **Coronal Mass Ejection (CME)** on the Moon's exosphere using its **CHACE-2 instrument**, marking a significant breakthrough in lunar science.



About Exosphere

The Moon has an extremely **thin atmosphere called an exosphere**, composed of helium, neon, argon, and trace elements from solar wind, radioactive decay, and meteoroid impacts. The Chandrayaan-2 mission has provided unprecedented insights into how solar activity influences this fragile environment.

Lunar Exosphere & Solar Interaction

- **Composition:** Gases are rarefied, causing minimal collisions between molecules.
- **Temperature Extremes:** Low density prevents heat retention, producing wide temperature variations.
- **Sources of Gases:** Solar wind, meteoroid impacts, radioactive decay, and photon-induced desorption from the surface.

Coronal Mass Ejection (CME)

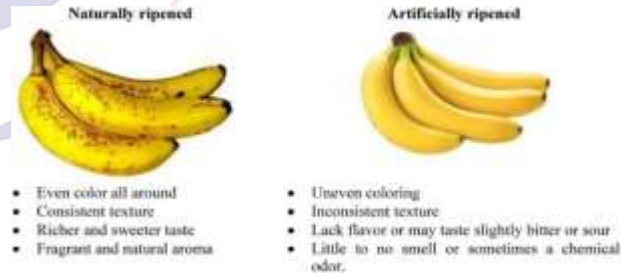
- **Definition:** CME is a massive release of plasma and magnetic fields from the Sun's corona.
- **Impact on Moon:** CME can modify the lunar exosphere, influencing density, composition, and dynamics of atoms and molecules.
- **Scientific Significance:** Understanding CME effects aids in **space weather research**, future lunar exploration, and planetary exosphere studies.

CALCIUM CARBIDE HAZARDS

SOURCE: THE HINDU

Why in News?

Over **60 people were hospitalized in Bhopal** due to injuries from makeshift **calcium carbide guns** during Diwali celebrations.



Calcium carbide (CaC_2) is a chemical used to generate acetylene gas for industrial applications and illicitly as a **fruit ripening agent**, banned under **FSSAI regulations**.

Uses and Risks

- **Industrial:** Steel cutting, acetylene gas production.
- **Health Hazards:** Skin burns, vomiting, dizziness, and long-term exposure risks.
- **Food Safety:** Residues of arsenic and phosphorus can contaminate fruits.

Regulatory Framework

- Prohibited under **Prevention of Food Adulteration Rules, 1955**.
- Restricted under **Food Safety and Standards Regulations, 2011**.

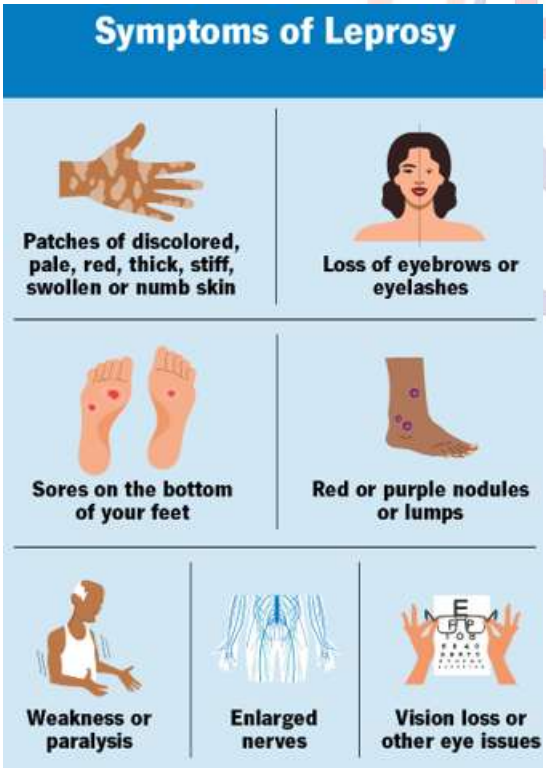
LEPROSY IN INDIA: THE ROAD TO A DISEASE-FREE FUTURE

Why in News?

India has achieved a **remarkable decline in leprosy prevalence**, from 57.2 per 10,000 in 1981 to 0.57 in 2025. The **National Leprosy Eradication Programme (NLEP)** now implements the **National Strategic Plan (2023-2027)** to eliminate indigenous cases by 2030.

About Leprosy:

- Leprosy, or Hansen's disease, is a chronic infectious disease caused by *Mycobacterium leprae*, affecting the **skin, peripheral nerves, eyes, and respiratory tract**, potentially causing **ulcers, deformities, and disability** if untreated.
- It spreads through droplets from close contact with untreated patients. Classified as a **Neglected Tropical Disease (NTD)**, it still affects over **120 countries**, with roughly **200,000 new global cases annually**.
- India has historically borne a high burden of leprosy, but systematic public health interventions have dramatically reduced prevalence.



India's Leprosy Control Journey

1. Early Efforts

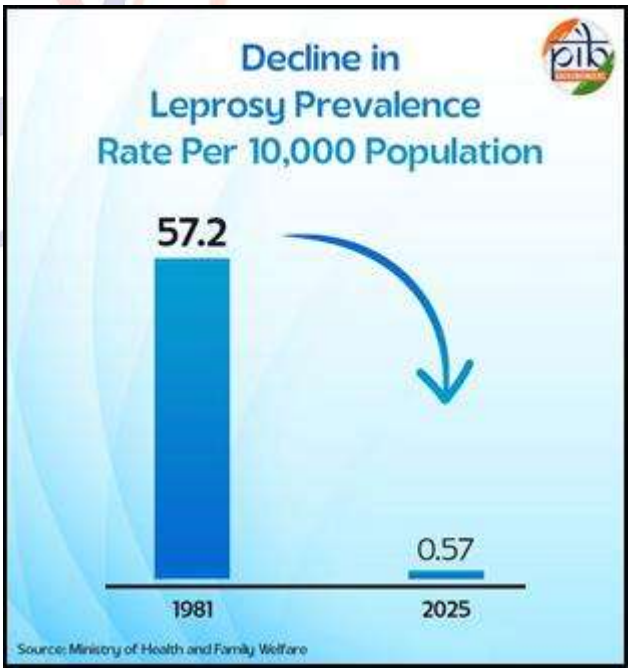
- **1954-55:** Launch of **National Leprosy Control Programme (NLCP)** using **Dapsone monotherapy**.
- **1983:** Transition to **National Leprosy Eradication Programme (NLEP)** after **WHO endorsed Multi Drug Therapy (MDT)**. MDT, offered free to patients, became the backbone of treatment and prevented disability progression.

2. Key Outcomes Under NLEP

- **Elimination Status:** Achieved national elimination (<1/10,000) in **2005**; prevalence now **0.57 per 10,000 (2025)**.
- **Grade 2 Disability:** Reduced to **1.88 per million**.
- **Child Case Reduction:** Declined from **9.04% (2014-15)** to **4.68% (2024-25)**.
- **New Case Detection Rate:** Dropped from **9.73 to 7.0 per 100,000**.
- **Post Exposure Prophylaxis (PEP):** Coverage among eligible contacts increased to **92%**.

3. National Strategic Plan (NSP) 2023–2027

- Aligns with **Global Leprosy Strategy (2021–2030)** and **WHO NTD Roadmap**.
- Focuses on **interruption of transmission by 2027** and recovering from COVID-19 setbacks.
- Emphasizes **active case detection, contact tracing, integration with health programs**, and targeted monitoring.



Other National and Global Initiatives

National-Level Measures:

- **Nikusth 2.0:** Digital patient tracking and district monitoring.
- **National AMR Surveillance for Leprosy (2023):** Tracks **drug resistance**.

- Integration with **Ayushman Bharat, RBSK, RKSK** for comprehensive screening.
- Inclusion of **Particularly Vulnerable Tribal Groups (PVTGs)** in interventions.
- **Special Monitoring:** 121 districts with high prevalence (>1/10,000).

Global Collaboration:

- **WHO:** Ensures free MDT, technical support, program monitoring; supports **Modified Leprosy Elimination Campaigns (MLECs)** and **COMBI pilot programs**.
- **World Bank:** Funded **IEC campaigns** and community interventions (1993–2004).

Conclusion

India's **remarkable 99% reduction in leprosy prevalence** demonstrates the success of sustained public health initiatives. Continued implementation of the **NSP 2023–2027** and global collaboration can achieve **zero indigenous cases by 2030**. **Strategic, technology-driven, and inclusive interventions remain key** to fully eliminating leprosy.

SECURITY

PRELIMS POINTERS IN NEWS

DHVANI MISSILE

SOURCE: PIB

Why in News?

India's **DRDO** is preparing to conduct the first test of **Dhvani**, a **hypersonic glide vehicle (HGV)** missile that could elevate India to the league of global hypersonic powers.

Key Features of Dhvani Missile

- **Type:** Hypersonic Glide Vehicle (HGV).
- **Speed:** Capable of exceeding **Mach 5–6** (approx. **7,400 km/h**).
- **Range:** Estimated between **6,000 to 10,000 km**.
- **Design:** Blended **wing-body configuration**, measuring about **9 meters long and 2.5 meters wide**.
- **Targets:** Can strike **land and maritime** targets with high accuracy.

Technological Innovations

- **Propulsion:** Achieves speed through **boost-glide technology**, not continuous rocket thrust.
- **Thermal Shielding:** Uses **ultra-high-temperature ceramic composites** that can withstand **2,000–3,000°C** during reentry.
- **Stealth Features:** Smooth contours and angled surfaces reduce **radar cross-section**, making it nearly **invisible to enemy radars**.
- **Guidance System:** Incorporates **AI-based navigation** for pinpoint accuracy.

Strategic Importance

- **Global Standing:** Places India alongside nations like **USA, China, and Russia** in hypersonic weapons development.
- **Deterrence Power:** Enhances India's **second-strike capability** and strengthens national defense.
- **Dual Use:** Can be deployed for **strategic deterrence** and **long-range precision strikes**.
- **Defense Advantage:** Its **maneuverability and high speed** make interception by current missile defense systems nearly impossible.

Future Prospects

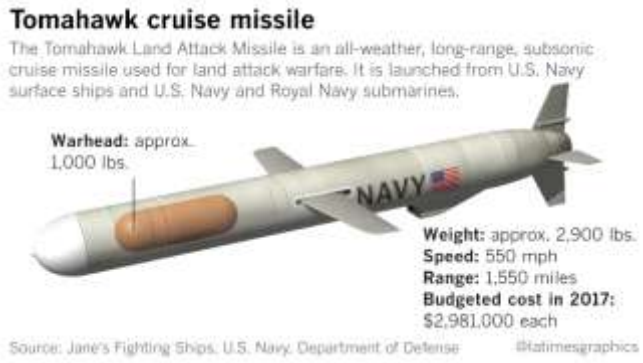
- Could serve as the **base model** for future **Hypersonic Cruise Missiles**.
- Likely to integrate with **Agni or BrahMos platforms** for advanced deployment.
- Reflects India's commitment to **indigenous technological self-reliance** under **"Aatmanirbhar Bharat."**

TOMAHAWK MISSILE

SOURCE: HINDUSTHAN TIMES

Why in News?

Russian President **Putin warned** that US approval to deliver **Tomahawk missiles to Ukraine** could severely impact **Washington-Moscow relations**.



About Tomahawk Missile:

- **Type:** Long-range **cruise missile** used for **deep land attack**.
- **Origin:** United States; first combat deployment **Operation Desert Storm (1991)**.
- **Launch Platforms:** Ships and **submarines** via Vertical Launch System (VLS).

Specifications:

- **Length & Weight:** 18.3 ft, ~3,200 lbs (4,400 lbs with booster).
- **Warhead:** 1,000 lbs conventional or cluster munitions.
- **Propulsion:** Solid propellant at launch, **turbofan engine** for flight.
- **Accuracy:** GPS, inertial navigation, and terrain contour mapping; **10 m margin of error**.
- **Speed & Range:** Up to 885 km/h, range ~2,400 km.
- **Tactical Advantage:** Low-altitude, non-linear flight path reduces **interception risk**.

Operational Significance:

- Targets **communication hubs, air defenses, and strategic installations**.
- Cost: **~$2 million per missile**.
- Enhances **precision strike capabilities** without risking manned aircraft.

ASTRA MARK 2 MISSILE

SOURCE: THE HINDU

Why in News?

The **DRDO** has announced plans to **extend the range of the Astra Mark 2 missile to beyond 200 km**, enhancing India's long-range air combat capability.

About Astra Mark 2:

- **Astra Mark 2** is an **indigenously developed Beyond Visual Range (BVR) air-to-air missile** designed to target enemy aircraft at extended ranges.
- Developed by **DRDO** in collaboration with **Hindustan Aeronautics Limited (HAL)** and over **50 Indian industries**, reflecting India's growing self-reliance in defense technology.

Features:

- **Dual-pulse solid-fuel motor** for greater range and efficiency compared to Astra Mk-1's single-pulse system.
- **Range:** 150–180 km, with plans to exceed **200 km**.
- **Speed:** Can travel at **Mach 4.5**.
- **Seeker:** Equipped with an **indigenous Radio Frequency (RF) seeker** for precision targeting.
- **Dimensions:** Diameter of 190 mm and weight of about 175 kg.
- **Compatibility:** Integrated with fighter jets like **Su-30 MKI** and **LCA Tejas**.

Significance:

- Strengthens **India's air dominance** by enabling long-distance precision engagement.
- Reduces reliance on imported missiles such as **Meteor** and **AMRAAM**.
- Offers **export potential** to friendly nations, promoting India's defense manufacturing.

DRDO'S MILITARY COMBAT PARACHUTE SYSTEM (MCPS)

SOURCE: THE HINDU

Why in News?

DRDO successfully tested the **indigenously developed Military Combat Parachute System (MCPS)** from a record altitude of **32,000 feet**, marking a significant step in India's self-reliance in defence technologies.

About (MCPS)

The MCPS is a **high-altitude parachute system** designed to enhance the operational capability of the Indian Armed Forces. It combines advanced navigation, safety, and mission efficiency features, reducing dependency on imported systems.

Key Features

- **Development**: Created by DRDO's **Aerial Delivery R&D Establishment (Agra)** and **Defence Bioengineering & Electromedical Lab (Bengaluru)**.

- **High-altitude Operations**: Only parachute in active use capable of functioning above **25,000 feet**.
- **Navigation Security**: Integrated with **NavIC**, ensuring secure, jamming-resistant navigation.
- **Advanced Safety**: Lower descent rate, precise steering, and predetermined landing zones improve **paratrooper safety**.
- **Strategic Significance**: Enhances **operational autonomy**, reduces foreign dependency, and allows **faster maintenance** during emergencies or wartime.

Conclusion

The MCPS reflects **India's push for indigenous defence innovation**. It strengthens **strategic capabilities** and operational readiness of the armed forces. The system enhances **self-reliance while ensuring high-altitude deployment efficiency**.

HYUNMOO-5 MISSILE

SOURCE: THE HINDU

Why in News?

South Korea plans to deploy its **Hyunmoo-5 "monster missile"** by the end of 2025, marking a **major conventional military upgrade** against North Korea.

The **Hyunmoo-5 missile** is a **long-range ballistic system** designed for deep-penetration strikes with conventional warheads capable of destroying **fortified underground targets**.

Key Features

- Weight: **36 tonnes**; Warhead: **8 tonnes**
- Range: **600 km to 5,000+ km** depending on payload
- Speed: Can reach **Mach 10** during descent
- Role: Part of **Korean Massive Punishment and Retaliation (KMPR)** framework
- Mobility: Launchable from mobile platforms for strategic flexibility

Strategic Importance

- Deterrence against North Korea without nuclear escalation.
- Strengthens South Korea's conventional strike capability.
- Signals technological and military modernization in the region.

JAIMEX 2025 (JAPAN-INDIA MARITIME EXERCISE)

SOURCE: PIB

Why in News?

The **Indian Naval Ship (INS) Sahyadri** recently participated in the **sea phase of JAIMEX-25**, a bilateral maritime exercise between **India and Japan**, aimed at strengthening strategic and operational cooperation in the Indo-Pacific region.

JAIMEX is a **key naval exercise** that reflects the **Special Strategic and Global Partnership** between India and Japan, established in 2014. The exercise is designed to **enhance interoperability, share best practices, and build mutual trust** between the two navies in areas critical for regional security.

Objectives

- Reinforce **navy-to-navy interactions** and professional collaboration.
- Promote a **free, open, and inclusive Indo-Pacific**.
- Conduct joint operations, including **anti-submarine warfare, missile defence, and replenishment at sea**.

Phases of the Exercise

1. **Sea Phase**
   - Advanced **Anti-Submarine Warfare (ASW)** drills.
   - **Missile defence operations** and tactical maneuvers.

- **Flying operations** and **underway replenishment** exercises.

2. **Harbour Phase (Yokosuka)**
   - **Professional and cultural exchanges**.
   - **Cross-deck visits** and **operational planning**.
   - **Sharing best practices** in naval operations.

Significance

- Strengthens **India-Japan maritime cooperation**.
- Acts as a **strategic pillar** for regional peace in the Indo-Pacific.
- Complements other bilateral exercises:
  - **Malabar** – Naval
  - **Veer Guardian** – Air Force
  - **Dharma Guardian** – Army

Key Facts about INS Sahyadri

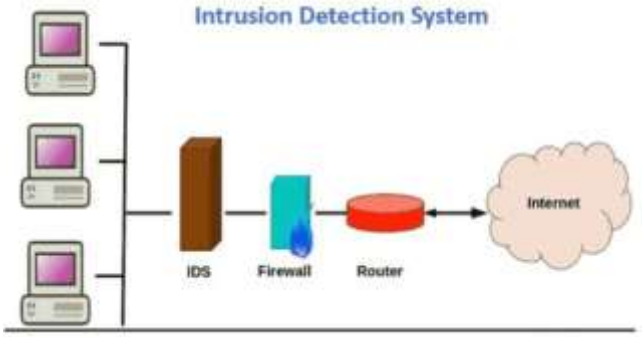
- **Shivalik-class guided missile stealth frigate**, commissioned in 2012.
- Equipped with **Barak-1, Shtil-1 missiles, BrahMos anti-ship missiles, and anti-submarine rocket launchers**.
- Participated in **bilateral, multilateral, and operational deployments**, showcasing **indigenous shipbuilding capabilities**.

INTRUSION DETECTION SYSTEM (IDS)

SOURCE: INDIAN EXPRESS

Why in News?

Northeast Frontier Railway (NFR) successfully tested the **Intrusion Detection System (IDS)** in four sections to **protect wildlife along railway tracks**.



IDS is a **technology-driven initiative** to prevent wildlife-train collisions, especially in areas with **elephant corridors and forested regions**.

Working Mechanism

- **Technology:** Optical fibre sensors detect vibrations from animals approaching tracks.
- **Real-Time Alerts:** Sends instant warnings to train drivers and control rooms.
- **Operational Range:** Runs parallel to tracks at a distance of **10 metres**.

Significance

- Protects **endangered species** and reduces wildlife mortality.
- Maintains **operational efficiency** of railways in sensitive ecological zones.
- Aligns with **India's commitment to wildlife conservation** under the Wildlife Protection Act, 1972.

STORM SHADOW MISSILE

SOURCE: HINDUSTHAN TIMES

Why in News?

Ukraine recently used **UK-made Storm Shadow long-range missiles** to strike a Russian chemical plant, demonstrating precision strike capabilities.

The **Storm Shadow missile (SCALP in France)** is a **long-range, air-launched cruise missile** developed jointly by the **UK and France**. It is designed for **precision strikes on high-value stationary targets** in all weather conditions.

Key Features

- **Range:** >550 km
- **Warhead:** 450 kg conventional, capable of penetrating hardened bunkers
- **Length & Wingspan:** ~5 meters long, 3 meters wingspan
- **Speed:** Subsonic (~Mach 0.8), low-altitude terrain-following flight
- **Guidance:** GPS/INS, infrared terminal homing, and terrain mapping

Operational Platforms

- Integrated with **Rafale fighter jets** (India)
- Used by **Egypt, India, Italy, Greece, Saudi Arabia, Qatar, UAE**

Purpose & Significance

- Neutralizes **military bases, radar stations, communication hubs, and port facilities**.
- Ensures **precision and minimal collateral damage** in modern warfare.
- Enhances **strategic deterrence and operational flexibility**.

SOCIETY

VULNERABLE SECTIONS OF SOCIETY

CRIME IN INDIA 2023 REPORT

SOURCE: THE HINDU

Why in News?

The **National Crime Records Bureau (NCRB)** released its *Crime in India 2023 Report*, showing a **7.2% rise in total registered crimes** compared to 2022, with more than **6.24 million cases** reported. This is also the **final year of crime data under the Indian Penal Code (IPC)** before India transitions to the *Bharatiya Nyaya Sanhita (BNS), 2023*.

Key Findings of the Report

Overall Crime Trend

- India recorded **6.24 million criminal cases** in 2023 — an overall rise of **7.2%**.
- Cases under the **IPC** increased by **5.7%**, while those under **Special and Local Laws (SLL)** grew by **9.5%**.
- On average, **a crime was registered every five seconds**, underlining the scale of India's criminal caseload.
- The 2023 report marks a **turning point**, being the last one under IPC before the adoption of *Bharatiya Nyaya Sanhita* in 2024.

Rising Cybercrimes

- **Cyber offences** witnessed the sharpest increase — up **31.2%** in one year.
- Major cases involved **cheating through impersonation**, phishing, and online fraud.
- **Offences under the IT Act** increased by **36%**, reflecting both increased reporting and wider online criminality.
- The data reveals a **shift from physical to digital crimes**, linked to India's rapid internet expansion.

Social Crimes

- **Crimes against women:** Increased by **0.7%**, totaling **4.48 lakh cases**.
- **Crimes against Scheduled Castes (SCs):** Slight rise of **0.4%**.
- **Crimes against Scheduled Tribes (STs):** Sharp increase of **28.8%**, pointing to regional and social vulnerabilities.
- **Crimes against children:** Rose by **9.2%**, emphasizing the growing need for child protection mechanisms.

Heinous and Other Crimes

- **Murder:** Decreased by **2.8%**, indicating better policing in some states.
- **Rape:** Fell by **5.9%**, while **dowry deaths** declined **4.6%**.
- **Offences against the State:** Reduced by **13.2%**, suggesting fewer political or insurgency-linked cases.

Police and Judicial Efficiency

- **Charge-sheeting rate:** Improved from **71.3% to 72.7%**, showing modest progress.
- **Pending investigations:** Increased slightly to **29.2%**, reflecting capacity constraints.
- **Conviction rate:** Stagnant at **54%**, underlining the need for **faster trials**, **stronger evidence collection**, and **better prosecution mechanisms**.

About the NCRB

- The **National Crime Records Bureau** was set up in **1986** under the **Ministry of Home Affairs (MHA)** following the recommendations of the **Tandon Committee** and the **National Police Commission (1977–81)**.
- It acts as the **central data repository** for crime and criminal information, aiding national policy formulation and inter-state coordination.
- The NCRB manages the **Crime and Criminal Tracking Network & Systems (CCTNS)** and publishes key reports such as:
  - ***Crime in India***
  - ***Accidental Deaths and Suicides in India***
  - ***Prison Statistics India***

Drivers Behind Rising Cybercrime

1. **Expanding Internet Base:** Over **800 million users**, many new to digital platforms, lack cybersecurity awareness.
2. **Professionalized Cybercrime:** Use of **rented hacking tools, phishing kits, and botnets** for fraud and data theft.
3. **Cross-Border Networks:** Many scams originate from **foreign jurisdictions**, complicating enforcement.
4. **Data Leaks and Privacy Gaps:** Personal data sold on the **dark web** enables precision-targeted cyber frauds.

India's Cybersecurity Framework

1. **Legislative Measures:**
   - *Information Technology Act, 2000*
   - *Digital Personal Data Protection Act, 2023*
2. **Institutional Setup:**
   - **CERT-In:** Coordinates responses to cyber incidents.
   - **NCIIPC:** Protects critical information infrastructure.
   - **I4C (Indian Cyber Crime Coordination Centre):** Centralizes cybercrime control.
   - **Cyber Swachhta Kendra:** Promotes safe digital hygiene.
3. **Strategic Steps:**
   - **Bharat National Cybersecurity Exercise** — enhances preparedness among government and private agencies.

Conclusion

The *Crime in India 2023 Report* reflects India's **changing crime landscape**, marked by a decline in violent crimes but a surge in cyber and social offences. Strengthening **digital security**, **speeding up justice delivery**, and **enhancing data-driven policing** are vital for effective crime control. A proactive and technology-oriented criminal justice system will be essential for ensuring **public trust and national security** in the digital era.

RBI'S UPDATED RANGARAJAN POVERTY LINE

SOURCE: INDIAN EXPRESS

Why in News?

Economists from the **Reserve Bank of India (RBI)** have updated the **Rangarajan Poverty Line** for 20 major states using **Household Consumption Expenditure Survey (HCES) 2022–23** data, highlighting changes in rural and urban poverty levels across India.

About Poverty

- **Poverty** is a state of pronounced deprivation in well-being, where individuals lack adequate income or consumption to meet basic needs.
- Measuring poverty is crucial for understanding deprivation, monitoring progress, and designing targeted poverty-alleviation strategies.
- India has a long history of poverty estimation, evolving from calorie-based norms to multidimensional approaches, reflecting both income and quality-of-life deprivations.

RBI's Updated Rangarajan Poverty Line Highlights

1. Significant Declines in Poverty

- **Odisha:** Rural poverty fell from **47.8% (2011–12)** to **8.6% (2022–23)**.
- **Bihar:** Urban poverty decreased from **50.8%** to **9.1%**.

2. Minimal Declines

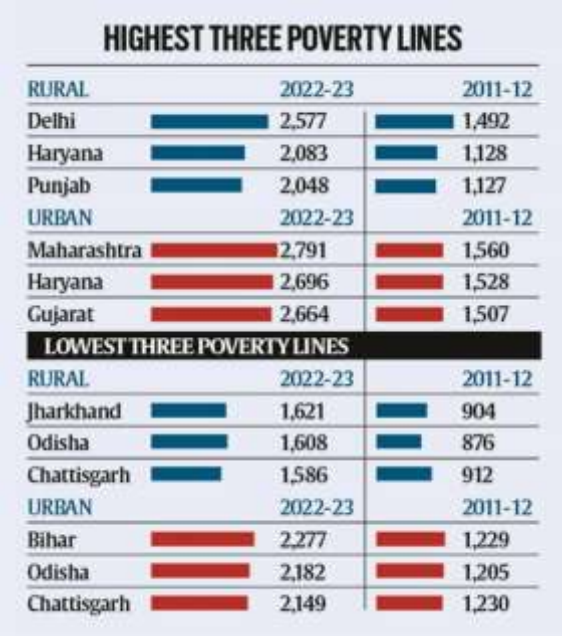
- **Kerala and Himachal Pradesh** recorded the smallest reduction, as their poverty levels were already low.

3. Rural and Urban Extremes (2022–23)

- **Rural Poverty:** Lowest in **Himachal Pradesh (0.4%)**, highest in **Chhattisgarh (25.1%)**.
- **Urban Poverty:** Lowest in **Tamil Nadu (1.9%)**, highest in **Chhattisgarh (13.3%)**.

4. Consumption Pattern Changes

- Shifts in consumption between 2011–12 and 2022–23 suggest future updates to poverty baskets and lines may be required.



Poverty in India

1. Historical Perspective

- **Pre-Independence:** Dadabhai Naoroji, National Planning Committee (1938), and Bombay Plan (1944) explored poverty and minimum living standards.
- **Post-Independence:** Planning Commission (1962) formalized poverty assessments.

2. Committees and Methodologies

- **Alagh Committee (1979) & Lakdawala Committee (1993):** Focused on consumption and calorie norms.

- **Tendulkar Committee (2009):** Introduced **all-India uniform Poverty Line Basket** and **Mixed Reference Period** for consumption.
- **Rangarajan Committee (2014):** Recommended **separate rural and urban poverty lines** (Rs 972 rural; Rs 1,407 urban), though not officially adopted.

3. Multidimensional Poverty

- **Global MPI (2025):** 1.1 billion people live in acute multidimensional poverty; 43.6% face severe deprivations in at least half of the indicators.
- **National MPI (NITI Aayog):** Shows a decline from **29.17% (2013–14)** to **11.28% (2022–23)**, with about **24.82 crore people escaping poverty**.

4. Income Inequality

- **Gini Index** fell from **28.8 (2011–12)** to **25.5 (2022–23)**, indicating reduced inequality.

Key Poverty Alleviation Schemes in India

- **DAY-NULM:** Enhances urban livelihoods.
- **PMAY-G:** Provides affordable rural housing.
- **PMGKY:** Economic relief for vulnerable groups.
- **Pradhan Mantri Suraksha Bima Yojana:** Social security coverage.
- **POSHAN Abhiyaan:** Nutritional support and awareness.
- **MGNREGA:** Guaranteed rural employment and income support.

Conclusion

The **updated Rangarajan Poverty Line** demonstrates substantial reductions in poverty, especially in high-burden states like Odisha and Bihar. Continuous monitoring, adaptation to consumption patterns, and effective implementation of **poverty-alleviation schemes** remain crucial to achieving **inclusive growth and equitable development** across India.

PRELIMS POINTERS IN NEWS

MERA HOU CHONGBA FESTIVAL

SOURCE: INDIAN EXPRESS

Why in News?

The **Mera Hou Chongba Festival** was recently celebrated in **Manipur**, symbolizing **hill-valley unity and communal harmony**.

About the Festival:

- **When:** Celebrated on the **15th lunar day of the Mera month** (Meitei calendar).
- **Where:** Manipur, mainly in **Imphal and surrounding tribal areas**.
- **Historical Roots:** Traced back to the reign of **King Nongda Lairen Pakhangba**, an early ruler of Manipur.

Rituals and Celebrations:

- The **titular King of Manipur** leads a **procession** from the Royal Palace to **Kangla Fort**, accompanied by tribal chiefs.
- Key rituals include:
  - **Mera Thaomei Thanba** – lighting of the ceremonial fire.
  - **Mera Yenkhong Tamba** – exchange of gifts.
- The festival ends with **traditional dance performances and a communal feast** showcasing cultural unity.

Significance:

- It is the **only festival** where **all indigenous communities of Manipur** — hill tribes and valley people — participate together.
- Reinforces **social harmony, cultural identity, and solidarity**.
- Promotes **tourism** and **cultural preservation** in Manipur.

NINGOL CHAKOUBA FESTIVAL – MANIPUR

SOURCE: THE HINDU

Why in News?

The Department of Fisheries, Manipur, recently organised the **Annual Fish Fair cum Fish Crop Competition** ahead of

the Ningol Chakouba festival, highlighting the cultural and economic significance of the event.

Ningol Chakouba is a **traditional festival of the Meitei community in Manipur**, celebrated to **strengthen familial bonds between married women and their parental families**. It reflects **social cohesion, cultural identity, and traditional customs**.

Significance

- **Social Bonding:** Married daughters return to their parental homes for a **grand feast**, fostering affection and family unity.
- **Cultural Heritage:** Represents Manipur's rich **traditions, customs, and culinary practices**.
- **Economic Dimension:** Promotes local **agriculture, fishery, and handicrafts**, supporting livelihoods.

Historical Background

- Dates back to **King Nongda Lairen Pakhangba's era**.
- Originally known as **Piba Chakouba**, it evolved into **Ningol Chakouba** during King Chadrakirti Singh's reign (1831–1886).

Customs and Practices

- **Invitation:** Sons formally invite their sisters a week before the feast.
- **Feast & Gifts:** Includes a **community meal, exchange of gifts, and celebrations**.
- **Diaspora Participation:** Observed by Manipuris globally, maintaining **cultural continuity**.

BATHOU RELIGION

SOURCE: TIMES OF INDIA

Why in News?

The **Bathou religion**, followed by the **Bodo community of Assam**, has been granted a **distinct religious code** in the upcoming **Census of India**.

About Bathou Religion

- Bathouism is the **indigenous faith of the Bodo people**, one of the largest plains tribes of Assam. The word *'Bathou'* is derived from *'Ba'* meaning five and *'Thou'* meaning deep philosophy — symbolizing harmony among **five natural elements**: air, sun, earth, fire, and water.

Key Facts

- **Deity:** The supreme god is **Bathoubwrai**, represented by the **Sijou plant (Euphorbia milii)**, planted in every Bodo courtyard.
- **Worship Practices:** Bathou rituals emphasize **nature worship, community harmony, and moral purity**.
- **Institutions:** The **All Bathou Religious Union (ABRU)** promotes the preservation and formal recognition of the faith.
- **Census Recognition:** Until now, followers were often recorded under "Others" or "Hindu." The new code ensures **accurate demographic representation** and preservation of **Bodo cultural identity**.

Significance

- Promotes **religious inclusion and cultural autonomy**.
- Enables **targeted welfare policies** for Bodo communities.
- Recognizes India's **indigenous faith diversity** in official statistics.

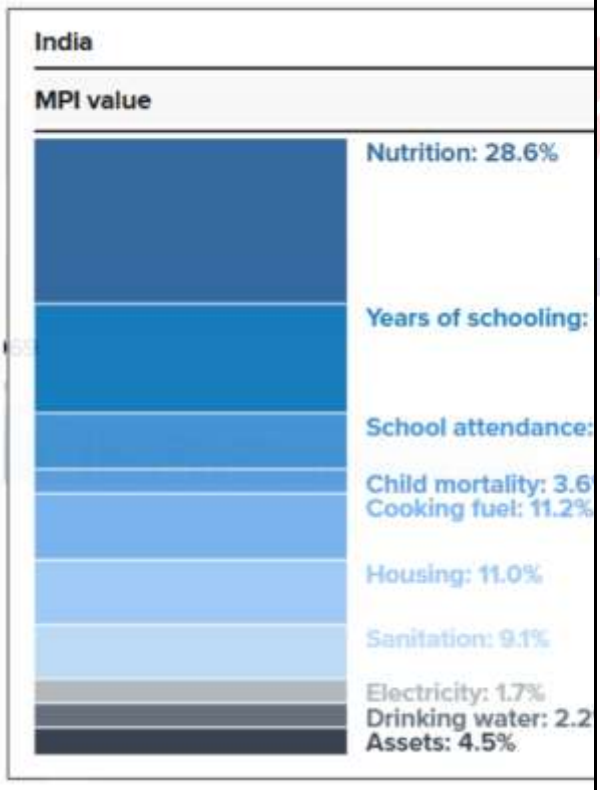
GLOBAL MULTIDIMENSIONAL POVERTY INDEX (MPI) 2025

Why in News?

The **UNDP and Oxford Poverty and Human Development Initiative (OPHI)** released the **2025 Global Multidimensional Poverty Index (MPI)** titled *"Overlapping Hardships: Poverty and Climate Hazards"*, highlighting how climate risks exacerbate poverty globally, including in India.

About Multidimensional Poverty Index (MPI)

- The **Multidimensional Poverty Index (MPI)** is a holistic measure of poverty that goes beyond income to capture multiple deprivations in **health, education, and living standards**.
- The 2025 report introduces a novel perspective by **overlaying climate hazards** such as **extreme heat, floods, droughts, and air pollution** with poverty, revealing how poor populations are disproportionately exposed to environmental shocks.



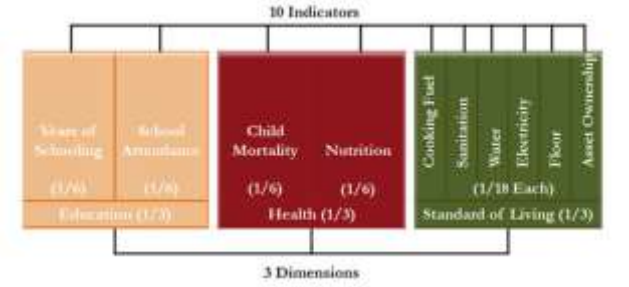
Key Findings of the 2025 Global MPI Report

1. **Global Poverty Statistics**
   - Out of **6.3 billion people** in 109 countries, **1.1 billion (18.3%)** live in **acute multidimensional poverty**.
   - The majority are **young, rural, and reside in low human development countries**.
2. **Multidimensional Poverty in India**
   - India's poverty reduced from **55.1% in 2005–06** to **16.4% in 2019–21**.
   - However, **large areas face overlapping deprivations**, combined with **high heat, flooding, and air pollution**, increasing vulnerability.
3. **Poverty and Climate Interlinkages**
   - **Climate shocks** are intensifying, displacing **32 million people in 2022**.
   - Without strong **climate mitigation**, extreme poverty could **almost double by 2050**.
   - **309 million people** live under **three or four overlapping climate hazards** with severe poverty, facing a "triple or quadruple burden" with limited assets or social protection.
4. **Poverty Across Income Levels**
   - Around **64.5% of the world's poor** live in **middle-income countries**.
   - Distribution: **55.5% in lower-middle-income** and **9% in upper-middle-income nations**.
5. **Common Deprivations**
   - **Clean cooking fuel**: 970 million people.
   - **Adequate housing**: 878 million.
   - **Sanitation**: 830 million.
   - **Undernutrition**: 635 million.
   - **Out-of-school children**: 487 million.
6. **Progress in MPI Reduction**
   - Of 88 countries with comparable data, **76 showed declines** in MPI at least once.
   - **Fastest reductions**: Benin, Cambodia, Tanzania.

Multidimensional Poverty Index (MPI)

1. **Purpose**
   - Captures **non-monetary deprivations** to complement income-based poverty measures (e.g., USD 3/day).
   - Helps design **targeted and effective policies**.
2. **Dimensions & Indicators**
   - **Health (2)**: Nutrition, Child Mortality.
   - **Education (2)**: Years of Schooling, School Attendance.

- **Standard of Living (6)**: Cooking Fuel, Sanitation, Drinking Water, Electricity, Housing, Assets.



3. **Weighting & Computation**
   - Health, Education, and Living Standards: **1/3 each**.
   - Health & Education indicators: **1/6 each**.
   - Living Standards indicators: **1/18 each**.
4. **Identification of Poverty**
   - A person is **multidimensionally poor** if deprivation ≥ **33.3%**.
   - MPI = **H × A**, where **H** = incidence of poverty, **A** = intensity of poverty.

Challenges & Measures for Poverty Alleviation

Challenges	**Required Measures**
Multidimensional deprivations	Integrate **POSHAN Abhiyan, Samagra Shiksha, PM Awas Yojana** for holistic development
Vulnerability to climate shocks	Promote **climate-resilient agriculture, PM Fasal Bima, climate risk insurance**
Large informal workforce	Ensure **universal social security, skill development, e-Shram**
Regional & social disparities	Target **Aspirational Districts Programme, SC/ST sub-plans, scholarships**
Agricultural distress	Provide **PM-KISAN, FPOs, Agriculture Infrastructure Fund**

Conclusion

The **2025 MPI report** highlights the urgent link between **poverty and climate hazards**, posing a risk of reversing global gains. India has achieved **significant poverty reduction**, with Kerala eliminating extreme poverty. However, **overlapping deprivations and climate exposure** require **integrated, multidimensional policy action** for sustainable development.

CASTE CENSUS - (S E E E P C) SURVEY, TELANGANA, 2024–25

The Government of Telangana completed one of its most ambitious data-gathering exercises — the SEEEPC survey — between November 2024 and February 2025, covering over **3.55 crore individuals** and producing granular socio-economic and caste data.

An Expert Working Group led by former Supreme Court Judge B. Sudarshan Reddy submitted its report in July 2025. The survey is now set to underpin major policy decisions such as raising reservation quotas for Backward Classes (BCs) in local bodies.

Key Features

- **Name & Mandate:** The S-E-E-E-P-C Survey (often dubbed a "caste census") was launched on **6 November 2024** by the Telangana government.
- **Coverage:** It included around **1.12 crore households** and about **3.55 crore individuals** across all 33 districts.
- **Depth of Data:** For each person, information on up to **75 fields** was gathered including identity, assets, liabilities, education, employment, welfare-scheme reach and caste/sub-caste details.
- **Sub-Caste Categorisation:** The survey captured data across **243 sub-castes**, and even allowed "No Caste" or "Others" categories for those not identifying with listed groups.
- **Digital Implementation:** Equipped with robust IT systems, the survey used geo-referencing and real-time dashboards to track data collection and quality.

Methodology

- **Enumerators & Blocks:** Over **94,000 enumerators** and 9,628 supervisors visited households; each block comprised around 150 households.
- **Timeframe:** Data collection spanned roughly 50 days from November to December 2024; digitisation followed soon after.
- **IT Backbone:** Data entry, validation, reporting and analytics were managed via a purpose-built IT platform to ensure accuracy and timely access for administration.
- **Expert Review:** An independent Expert Working Group (IEWG) comprising academics, economists and social scientists (e.g., Kancha Ilaiah, Praveen Chakravarthy) analysed the dataset and developed a **Composite Backwardness Index (CBI)** ranking every sub-caste.

Key Findings

- **Population Share:** Preliminary data suggests BCs comprised around **56.33%** of the population (Hindu BCs ~46.25%, Muslim BCs ~10.08%). SCs ~17.42%, STs ~10.43%, Others ~15.79%.
- **Backwardness Index:** The CBI shows that approx. **71%** of the 134 BC sub-castes lie close to the "deep backwardness" threshold. Average score was 81 out of 126, indicating significant deprivation.
- **Education over Assets:** The survey revealed that **educational attainment**, particularly higher education and English medium, is a stronger driver of mobility than asset ownership.

Significance

- **Evidence-Based Policy:** The survey provides one of the **most granular caste-linked datasets** in India, which enables **precision targeting** of welfare schemes, reservation policy and resource allocation.
- **Model for Other States/Nation:** Telangana positions itself as a "pilot" for a possible national caste enumeration exercise; its methodology offers a blueprint.
- **Social Justice Implications:** Data showing large BC and deprived sub-caste populations strengthen the political and legal basis for expanding reservations, especially at local body level.

Challenges & Criticisms

- **Legal Validity:** Some legal experts argue that the survey lacked statutory underpinning under Articles 340/342A of the Constitution and thus is constitutionally vulnerable.
- **Transparency & Data Release:** Full caste-wise raw data has not yet been publicly released, raising questions of transparency and independent scrutiny.
- **Implementation Risks:** Collecting vast data is one thing; policy application, ensuring equitable benefit-distribution and avoiding misuse are another.

- **Political Sensitivity:** The survey data directly impacts reservation quotas, which is politically contentious and may fuel identity-politics.
- **Urban Coverage Gaps:** Urban areas, especially the Greater Hyderabad Municipal Corporation (GHMC) limits, had slightly lower coverage (< 100%), possibly affecting representativeness.

Policy Implications

- **Reservation Expansion:** Based on survey outcomes, Telangana aims to offer **42% reservations** to BCs in local bodies (raising total quota to ~67%) while awaiting Presidential approval.
- **Targeted Welfare:** The CBI enables identification of **sub-castes most deprived** (ranked by backwardness) and directs resources accordingly.
- **Educational Reforms:** Emphasis will be placed on **higher education, English medium access** and skill development as mobility drivers.
- **State-wide Implementation:** Findings may lead to differentiated policy for rural vs urban backward sub-castes, planning in housing, livelihoods and welfare schemes.
- **Replication to National Census:** The Union Government's move to include caste enumeration in the upcoming population census may draw heavily on the Telangana methodology.

Way Forward

- **Public Release of Data:** For legitimacy and trust, the State must publish full data sets (with personal privacy safeguards) allowing independent analysis and public debate.
- **Legal Framework Clarification:** States must ensure that such surveys are anchored in constitutional/statutory provisions to avoid legal challenges.
- **Capacity Building:** Strengthen institutional capacity
- (state BC commissions, data analytics cells) to convert data into results, monitor outcomes, and apply corrective action.
- **Institutionalise Monitoring:** Regular tracking of scheme uptake, social indicators and backwardness score changes over time (say, every 5 years) to measure policy effectiveness.
- **National Integration:** The central government should provide guidelines/framework for state caste surveys and ensure standardisation, comparability and interoperability with national census data.

Conclusion

The Telangana SEEEPC survey embodies a **transformative leap in data-driven social policy** — by moving beyond mere headcounts to detailed socio-economic and caste-disaggregated information, the state equips itself for **targeted justice, welfare and inclusive growth**. However, its long-term value will hinge on **transparent data release, legally sound implementation, and translating insights into measurable outcomes**. With these in place, Telangana's experiment could truly become a **national template** for socially equitable governance.

DEVELOPMENT PROJECTS IN ANDHRAPRADESH

On 16 October 2025, Narendra Modi, Prime Minister of India, visited Kurnool in Andhra Pradesh and formally **inaugurated**, **dedicated**, and **laid foundation-stones** for a suite of development projects valued at approximately **₹13,430 crore**.

These projects span **industry, energy, transport (roads & railways), defence manufacturing, petroleum & gas**, and aim to accelerate growth of the Rayalaseema region and Andhra Pradesh as a whole.

Scope & Sector-Wise Highlights

1. Energy & Transmission

- A major **transmission system strengthening project** at the Kurnool-III Pooling Station has been initiated at an investment of **over ₹2,880 crore**. It will include a **765 kV double-circuit line** from Kurnool-III to Chilakaluripeta, increasing transformation capacity by **6,000 MVA** and enabling large-scale transmission of renewable energy.
- PM Modi emphasized that electricity has now reached every village and per-capita consumption has risen to **~1,400 units**.

2. Industrial & Manufacturing Hubs

- The foundation stone for the **Orvakal Industrial Area (Kurnool)** and the **Kopparthy Industrial Area (Kadapa)** were laid, with a combined investment of around **₹4,920 crore**. These multi-sectors "plug-and-play" hubs, developed by NICDIT & APIIC, are expected to attract **₹21,000 crore** in investment and generate about **1 lakh jobs**.
- The PM declared that Kurnool is being positioned as India's **Drone Hub**, tying into India's defence manufacturing push and the success of "Operation Sindoor".

3. Transport Infrastructure – Roads & Railways

- A six-lane greenfield highway from Sabbavaram to Sheelanagar (investment ~₹960 crore) was announced to decongest Visakhapatnam and boost trade.
- Six additional road projects worth ~₹1,140 crore were inaugurated, including four-laning sections on key highways (NH-165, NH-565, NH-544DD) and a major bridge over the Papagni River.
- Railway projects worth over **₹1,200 crore** were launched: the foundation for the Kottavalasa–Vizianagaram Fourth Railway Line, a rail-flyover between Pendurti and Simhachalam North, and doubling of sections such as Kottavalasa–Boddavara and Shimiliguda–Gorapur.

4. Defence & Strategic Manufacturing

- The inauguration of an **Advanced Night Vision Products Factory** at Nimmaluru (Krishna district), by BEL, valued at ~₹360 crore, will manufacture electro-optical systems for the armed forces, enhancing India's self-reliance in defence manufacturing.

5. Petroleum & Natural Gas

- A 124 km section of the Srikakulam–Angul Natural Gas Pipeline (GAIL) costing ~₹1,730 crore (with 298 km in Odisha) was dedicated.
- A 60 TMTPA LPG bottling plant at Chittoor (~₹200 crore investment) was also inaugurated; the plant will serve over 7.2 lakh customers across four districts of Andhra Pradesh, two of Tamil Nadu and one of Karnataka.

Regional & Strategic Significance for Rayalaseema / Andhra Pradesh

- The PM emphasised that development of Rayalaseema (including Kurnool) is "critical to the nation's overall progress".
- By focusing on Kurnool, the initiative seeks to reduce regional imbalances, boost local employment, and integrate the area with national growth corridors.
- Through industrial hub creation and energy/transmission upgrades, the region's potential for manufacturing, logistics, and renewable energy is being unlocked.
- Investment in high-tech/digital infrastructure (e.g., drone hub, AI centre at Visakhapatnam mentioned by PM) signals shift from traditional agriculture to a modern economic base.
- The initiative also supports the "Double Engine" model of central-state cooperation, with the Centre pledging strong support for Andhra's progress.

Linkages to National Vision: Manufacturing, Energy Transition & Connectivity

- The projects align with the government's "Aatmanirbhar Bharat" and manufacturing push. Defence manufacturing, industrial corridors and plug-and-play infrastructure underscore this.

- The transmission upgrade supports India's clean energy ambitions by facilitating **renewable-energy evacuation** and strengthening grid stability.
- Road and rail investments enhance **multi-modal connectivity**, facilitating logistics, trade, and movement of goods & people — crucial for India's integration into global supply chains.
- Petroleum & gas infrastructure contributes to India's energy security and the shift to cleaner fuel linkages.

Implementation Challenges & Considerations

- **Land acquisition and resettlement** remain sensitive issues in industrial hub development; ensuring timely and fair compensation is vital for project momentum.
- **Skilling and employment absorption**: While job-creation targets (e.g., 1 lakh jobs) are encouraging, matching local workforce skills to new manufacturing and high-tech demands will be critical.
- **Environmental safeguards** must be integrated — large-scale transmission, industrial hubs and highways require careful consideration of ecological and social impacts.
- **Execution and timelines**: Laying foundation stones is a start; timely completion, budget adherence and quality assurance will determine real impact.
- **Connectivity of smaller towns/villages**: While major infrastructure is being upgraded, ensuring last-mile connectivity and benefits for rural/pro-marginalised populations remains essential.
- **Sustainability of energy infrastructure**: Ensuring that the transmission projects incorporate renewable energy integration, and that industrial hubs adopt low-carbon patterns, will align them with climate goals.

Conclusion

The Kurnool projects mark a decisive push toward balanced regional growth and industrial diversification in Andhra Pradesh. Successful implementation can make Kurnool a model of infrastructure-led transformation. However, ensuring inclusivity, environmental care, and timely execution will be crucial. Together, these initiatives reflect India's march toward a **Viksit Bharat by 2047**.

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